Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

5th Global Outreach Conference
on
Modern Approaches for Smart Agriculture
(MASA - 2020)

on 28th & 29th February 2020

Organised by

SCHOOL OF BIOLOGICAL ENGINEERING & LIFE SCIENCES

Shobhit Institute of Engineering and Technology, Meerut

(A NAAC Accredited Deemed-to-be-University established u/s 3 of UGC Act 1956)

NH-58, Modipuram, Meerut 250110

E-mail: suconference2020@shobhituniversity.ac.in

Contact: 8077633273, 9411026181, 9410816444

In Collaboration with

Global Outreach Research & Education Association
Office Address : **GOREA CHARITABLE FOUNDATION**
H.No. 69-339, Mansarovar, Jaipur,
Rajasthan-302020, India | www.gorea.org

Society for Plant Research (Vegetos)
An International Journal of Plant Research and Biotechnology
Published by: **Springer**
Website Address: www.vegetosindia.org,www.springer.com

Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

5th Global Outreach Conference

on

"Modern Approaches for Smart Agriculture" (MASA-2020)

(28-29 February, 2020)

Abstract Book

School of Biological Engineering & Life Sciences
Shobhit Institute of Engineering and Technology
(Deemed-to-be-University) Meerut, India

ORGANIZING COMMITTEE

PATRON

Shri Kunwar Shekhar Vijendra, Hon'ble Chancellor, SIET, India

ORGANIZING CHAIRMAN

Prof. (Dr.) Amar P. Garg, Vice Chancellor, SIET, Meerut

CO-CHAIRMAN

Prof. (Dr.) D.K. Kaushik, Vice Chancellor, SIET, Gangoh
Major General (Retd.) Dr. Sunil Chandra, Pro Vice Chancellor, SIET, Meerut
Prof. (Dr.) Ranjit Singh, Pro Vice Chancellor, SIET, Gangoh
Prof. M. Moni Professor Emeritus (Agri-Informatics & e-Governance), CAIGRS, SIET, Meerut

SECRETARIES

Prof. (Dr.) Satya Prakash, Dean, Department of Agriculture, SIET, Meerut
Prof. (Dr.) Sandeep Kumar, SIET, Meerut

CO-ORGANIZING SECRETARIES

Dr. Maya Datt Joshi
Dr. Alpana Joshi
Dr. Snigdha Tiwari
Dr. Saurabh Tyagi
Dr. Dinesh Kumar
Dr. Amit Kumar
Dr. Divya Praksah

JOINT SECRETARIES

Ms Beena Rawat
Mr. Rupesh Kumar
Er. Gaurav Yadav
Ms. Shiva

TECHNICAL COMMITTEE INCHARGE

Mr. Avinav Pathak
Mr. Pawan Kumar

ADVISORY COMMITTEE

Prof. P. S. Bisen
(Ex-Vice-Chancellor, Jiwaji University, Gwalior)

Prof. R.K. Mittal
(Vice-Chancellor of SVP University, Meerut)

Prof. H. N. Verma
(Vice-Chancellor, Jaipur)

Prof. Dalel Singh
(Ex Vice-Chancellor, OPJS University, Churu, Rajasthan)

Prof. Satyen Yadav
(Chairman, CADMS, SIET)

Prof. S.K. Bhatnagar
(Editor-in-Chief, Vegetos)

Prof. P.K. Gupta
(CCS University, Meerut**)**

Prof. Ajit Varma
(AIMT, Amity University, Noida)

Prof. V.K. Barnwal
(IARI, New Delhi)

Prof. K.S. Rao
(Department of Botany, University of Delhi, Delhi)

Prof. Shamsher Singh
(CCS University, Meerut**)**

Dr. Wajid Hasan
(KVK, Jehanabad, Bau)

Dr. Joginder Singh
(J B College, Baraut)

About the Organizer

SHOBHIT DEEMED UNIVERSITY, MEERUT, INDIA

Shobhit Institute of Engineering and Technology (popularly known as Shobhit University, Meerut), is a NAAC accredited deemed to-be university u/s 3 of UGC Act, 1956. Ranked among the top institutions of India.The University aspires to make academic issues and commitments as the key concerns of the young generation and thereby, make a significant contribution to the academic developments wherever they are in the world.

We believe that the essence of the University is to create, integrate and disseminate better understandings of the world around us through knowledge. Recognizing that students and faculty shift between and share all three roles, we challenge the notion that knowledge is static and insular. Instead, we welcome and enable a diverse and dynamic learning community of scholars, teachers, and learners.

We are committed to creating the best learning environment and provide the right equipment and facilities, to help our students to achieve their potential during studies. Our students learn in a variety of ways, including case studies, role-plays, and simulations. Because we know that no single approach can effectively address the range of challenges they'll encounter throughout their career, this diverse education is designed to give them the breadth and depth of skills and experience they'll need for success.

We are a research-intensive university that shares the values of high-quality teaching within an environment of internationally competitive research. We seek to provide a creative and supportive environment in which ideas are generated and can flourish.

To provide latest information about the things which are happening in science and technology, the University strategically plans and organizes workshops, seminars, conferences, and brain storming sessions at national and international level with the help of experts from academia, industry, and research organizations.

University Training & Development Centre understands that active engagement of the industry with the academia is vital for developing the required skills in the future professionals. To facilitate the industry in the current scenario of the skill gap on one hand and to enrich students with the industry exposure on the other hand; a one semester internship program has been incorporated in the course curriculum of maximum of the academic programs.

Today, Shobhit University is a preferred destination for recruitment among young universities in India. More than 200 renowned Corporate, Research Organizations and Institutions are patronizing our students by providing excellent job offers. The University has evolved into a Campus of Excellence. Our excellent talents are placed in the best of the corporate houses in India and abroad.

The University has developed the following Schools and Centre: School of Engineering & Technology, School of Biological Engineering & Sciences, School of Business Studies; School of Law and Constitutional Studies; School of Education; School of Humanities, Physical & Mathematical Sciences; Centre for Agriculture Informatics & Research; and Centre for Skill Development.

5th Global Outreach Conference
on
"Modern Approaches for Smart Agriculture" (MASA-2020)
28-29 February, 2020
School of Biological Engineering & Life Sciences
Shobhit Institute of Engineering and Technology (Deemed-to-be-University)
Meerut, India

Organizer **Co-Organizer**

ज्ञान–विज्ञान विमुक्तये

प्रो. धीरेन्द्र पाल सिंह
अध्यक्ष
Prof. D. P. Singh
Chairman

सत्यमेव जयते

विश्वविद्यालय अनुदान आयोग
University Grants Commission
(मानव संसाधन विकास मंत्रालय, भारत सरकार)
(Ministry of Human Resource Development, Govt. of India)
बहादुरशाह ज़फ़र मार्ग, नई दिल्ली-110002
Bahadur Shah Zafar Marg, New Delhi-110002
दूरभाष Phone : कार्यालय Off. : 011-23234019, 23236350
फैक्स Fax : 011-23239659, e-mail : cm.ugc@nic.in | web: www.ugc.ac.in

MESSAGE

I am pleased to know that the School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut, Uttar Pradesh in collaboration with Global Outreach Research & Education Association and Society for Plant Research is organizing 5th Global Outreach Conference on "*Modern Approaches for Smart Agriculture (MASA-2020)*" on 28th & 29th February, 2020. On this occasion, the department is planning to publish a Souvenir-cum- Abstract Book.

The theme of the conference is very relevant in the present context. The conference will provide a platform to generate thoughts and debates on policy, strategy and implementation of the Government of India initiatives of doubling farmer's income by 2022 using smart agriculture technologies. I am sure that the conference will see meaningful discussions and yield constructive results.

I extend my best wishes to the organizers of the conference as well as to the participants.

(Prof. D.P. Singh)

21st January, 2020

Shobhit Kumar
Chairman

MESSAGE

I am happy to note that Shobhit Institute of Engineering and Technology (SIET), Meerut is going to conduct an international conference on modern approaches for smart agriculture (MASA-2020) on 28th thru 29th Feb, 2020.

Increasing productivity in the farm has been our government's priority through various phases of development. I am glad our institution is participating in this national endeavor by locating areas of further research and agricultural actions, including networking.

I am informed that about 500 people will participate in this conference. It is a good number to start with. As this university marches forward in this initiative, and as more like it will join in the long march, a day is bound to come when we shall realize our beloved Prime Minister's call to double up the farming output by the next few years.

I wish participants, visitors and the organizers a very successful conference.

Shobhit Kumar

Shobhit Kumar
29.01.2020

Shobhit University

Shobhit Institute of Engineering & Technology, Meerut
(A NAAC Accredited Deemed to-be University established u/s 3 of UGC Act, 1956)
NH-58, Modipuram, Meerut - 250110, Delhi NCR

Shobhit University, Gangoh, Saharanpur
((Notified by Government of Uttar Pradesh vide UP State Act 03/2012))
Adarsh Institutional Area, Babu Vijendra Marg, Distt. Gangoh, Saharanpur - 247341, UP

University Tower, Pocket-B, Mayur Vihar Phase II, Delhi-110091, India
E.: chairman@shobhituniversity.ac.in | U: www.shobhituniversity.ac.in
T.: +91.11.43205500 | F.: +91.11.43205511

Kunwar Shekhar Vijendra
Chancellor

MESSAGE

I am glad that School of Biological Engineering & Life Sciences of Shobhit Deemed University, Meerut is going to organize a two-day global outreach conference on the subject: Modern Approaches for Smart Agriculture.

In the constant resource of land, what needs to be done most is to empower the farmer and farm-manager with all the necessary soft and hard technology to cope up with challenge of the right response to the land variants for higher productivity and right-time- and right-place-distribution. This fact of the smart farming has been talked about endlessly, especially on the face of Hon'ble Prime Minister's call to double to production by 2022.

I am glad that our university is alive to this challenge and is doing its best to boost research and solutions to the local diversities. I shall be very happy if this seminar turns out to be an opener of many such opportunities of learning and thinking -together in this important field.

Smart agriculture is our academic business, now on.

Please accept my good wishes for the occasion.

Kunwar Shekhar Vijendra
Chancellor
30-01-2020

Shobhit University

Shobhit Institute of Engineering & Technology, Meerut
(A NAAC Accredited Deemed to-be University established u/s 3 of UGC Act, 1956)
NH-58, Modipuram, Meerut - 250110, Delhi NCR

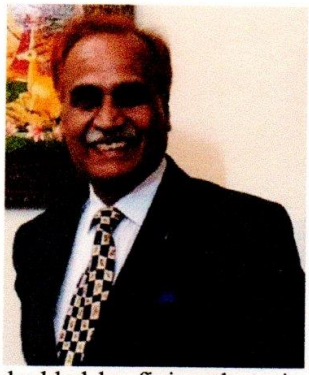
Shobhit University, Gangoh, Saharanpur
((Notified by Government of Uttar Pradesh vide UP State Act 03/2012))
Adarsh Institutional Area, Babu Vijendra Marg, Distt. Gangoh, Saharanpur - 247341, UP

University Tower, Pocket-B, Mayur Vihar Phase II, Delhi-110091, India
E.: chancellor@shobhituniversity.ac.in | U: www.shobhituniversity.ac.in
T.: +91.11.43205500 | F.: +91.11.43205511

Shobhit Institute of Engineering & Technology
Established u/s 3 of UGC Act, 1956
NH-58, Modipuram, Meerut 250110, INDIA
T.: 0121 2575091; F.: 0121 2575724
M.: 7617505011, 8077633273
E.: vicechancellor@shobhituniversity.ac.in
U.: **www.shobhituniversity.ac.in**

Amar P. Garg
Vice Chancellor
M.Sc., Ph.D., LL.B., F.B.S., F.P.S.I., F.S.M.P., M.N.A.Sc., F.N.R.S., CAS Fellow (U.K.), DAAD Fellow (Germany)
Sectional President (2020-21) - Environmental Science, 108th Indian Science Congress
Ex-Professor & Head, C.C.S. University, Meerut | Ex-PVC, JNU, Jaipur

MESSAGE



I am delighted to know that Shobhit Institute of Engineering & Technology (Deemed-to-be-University) Modipuram, Meerut is organising 5th Global Outreach Conference on **"Modern Approaches for Smart Agriculture (MASA-2020)** "from February 28-29, 2020 in Meerut.

The theme of the conference is based on rural development, a mission very close to the heart of our Hon'ble Prime Minister of India. The increase in production alone will not improve the condition of farmers. It will rather result in greater supply than demand which will further reduce of prices and will cause more dissatisfaction. I strongly believe that the farmer's income can be doubled by fixing the prices of agricultural produce at double the rate than the total cost of production. The farmers should be educated for modern technologies and for additional sources of income. They should be supported for good marketing including export of their commodities. I strongly believe that if India is to become a developed nation, its rural areas and villages must be economically self-sufficient and have all amenities from education to healthcare to transport, that are necessary for comfortable life.

Innovation is the key to rural development. We need pragmatic, cost-effective and creative scientific solutions to the problems faced by rural economy and society.

I am confident that the deliberations at MASA 2020 will lead to the formulation of viable and potent solutions to hasten the process of rural development.

I welcome all participants in MASA 2020.

24.2.2020

Dated: 24-02-2020

(Prof. Amar P. Garg)
Vice Chancellor

University Campus :
NH 58, Modipuram,
Meerut- 250 110, INDIA
T.: 0121-2575091/92; F.: 0121-2575724
Email:mail@shobhituniversity.ac.in
www.shobhituniversity.ac.in

Maj. Gen (Retd) Dr. Sunil Chandra

Pro Vice Chancellor

MESSAGE

I am very much pleased to know that the Shobhit Institute of Engineering & Technology, Merrut is organizing 5th Global Outreach Conference on "**Modern Approaches for Smart Agriculture (MASA-2020)**" on February 28-29, 2020.

I have a strong believe that this program has been going very timely when the country has given high consideration towards agriculture while adopting improved production technology. The government of India has been given due priority on the agricultural research, education & extension. The central government has set the target to double the income of farmers by 2022. Hence the outcome of this program would be very useful in shaping the future policy and programs for Indian agriculture. This will be equally important in achieving the targets of food & nutrition security. I hope the deliberation in the conference shall dwell on various dimensions in these important areas so as to open up new vistas of agricultural research for the guidance of policy planners.

I convey my good wishes to the organizers for the grand success of the conference.

Maj. Gen (Retd) Dr. Sunil Chandra

Pro Vice Chancellor

About the Society

GLOBAL OUTREACH RESEARCH EDUCATION ASSOCIATION (GOREA)

The Global Outreach Research & Education Association (GOREA) is a global organization of educationists, technologists, industrialists, business leaders and policymakers that work to create and sustain an environment conducive to the growth of research & education industry. It promotes and provides accreditation, certification, technical advancement, entrepreneurship and skill development. The Global Outreach Research & Education Association has firmly established a leadership role in research & education sector. The GOREA supports and encourages research & education in the field of technology, engineering, management, science and allied disciplines worldwide. The GOREA publishes out many print educational vehicles per year including its journals, newsletters, flagship magazines, and papers. The Global Outreach Research & Education Association (GOREA) was started by 51 Committee and Board members with 11 Member & 22 Associate Member Organizations including 11 countries (India, USA, Egypt, Vietnam, Oman, Canada, Zambia, Ethiopia, Romania, Taiwan and Nepal). The Global Outreach Research & Education Association (GOREA) was founded on 15 April, 2018 by Mr. Rakesh Kumar. The Organization was registered on 03 December, 2018 and is headquartered in Jaipur, India. GOREA CHARITABLE FOUNDATION is a Non-Profit Organization registered, under the Section 8 of the Companies Act, 2013, Government of India and is registered, under the Ministry of Micro, Small & Medium Enterprises, Government of India. GOREA and GLOBAL OUTREACH are word trademarks filed on 04 August 2018 in Bihar through Kolkata IP Office and 19 January 2019 in Rajasthan through Ahmedabad IP Office respectively.

About the Society

VEGETOS SOCIETY FOR PLANT RESEARCH

In Society for Plant Research (VEGETOS) was established in the year 1988 by Prof (Dr) S K Bhatnagar and colleagues after preparing the documents in the capacity of Founder Secretary General. The Society for Plant Research was registered as an autonomous, not for profit organization under the Societies Registration Act XXI of 1980 having its own constitution and Bye laws which are amended from time to time by Executive Council and General Body. The society was established with the view to provide an open platform to the researchers in various disciplines of Botany, Plant Sciences, Environmental Sciences, Biotechnology and related branches for publishing them researches in VEGETOS: An International Journal of Plant Research and Biotechnology having ISSN 0970-4078 and E-ISSN 2229-4473. Besides this, organizing Conferences and Workshops under the aegis of Society for Plant Research was an essential activity to facilitate scientific discussions, exchange of view and interaction among scientists. Publication of research journal VEGETOS: An International Journal of Plant Research & Biotechnology was also initiated in the year 1988. With an initial membership of 11 persons it has now reached more than 1800 from India and abroad. SPR's research journal VEGETOS (Quarterly) is globally recognized high impact factor journal being listed and covered by SCI, NCBI, NLM [Pubmed], Scopus [Elsevier], Publon, MIAR, CABI, Research gate, UGC, Clarivate Analytics, Copernicus and all relevant database. From the year 2019, Springer Nature has taken over VEGETOS as the co-publisher [Editor in Chief: Prof S K Bhatnagar] since January 1, 2019.

About the Conference

MODERN APPROACHES FOR SMART AGRICULTURE (MASA-2020)

We feel great pleasure in welcoming you all as organizing secretaries of 5Th Global Outreach Conference on **Modern Approaches for Smart Agriculture (MASA-2020)**, which is to be held on February 28-29- 2020.The conference is being organized by School of Biological Engineering and Life Sciences of Shobhit Institute of Engineering and Technology (Deemed to-be University) in collaboration with GOREA Charitable Foundation, Jaipur (Rajasthan) and Society for Plant Research (Vegetos). The prime objective of this International conference is to discuss the burning issues of Indian agriculture and farmers and also to find out the concrete solution to improve the income and economic condition of Indian farmers, which is one of the important agendas of central government. The central government has set a target to double the income of farmers by 2022.

Agriculture is the main stay of rural economy in western Uttar Pradesh since ages. This sector is fast emerging as a major venture in the region. It has great relevance in improving the overall all economy of the zone. The very specific agro-climatic condition of the region offers tremendous potential for the development of agriculture industry in the region. Due to better edapho-climatic condition in the region, the cultivation of field crops, fruits, cut flowers, vegetables, spices, medicinal and aromatic plants and oil seed crops has been a very profitable business not only because the major cities of western Uttar Pradesh are a part of national capital region but also because they are very nearer to national capital.

Considering the significance of agriculture in national economy, we are sure that this conference will discuss various issues of Indian agriculture and also to find out the solid recommendations which can be disseminated to farmer's field.

(Dr.) Satya Prakash & (Dr.) Sandeep Kumar
Organizing Secretary
MASA-2020

Life Time Award Lectures/Key Note Addresses

5th Global Outreach Conference
on
"Modern Approaches for Smart Agriculture" (MASA-2020)
28-29 February, 2020
School of Biological Engineering & Life Sciences
Shobhit Institute of Engineering and Technology (Deemed-to-be-University)
Meerut, India

Organizer

Co-Organizer

Problems and Solution of Indian Agriculture for Improvement of Farmer's Income

A. P. Garg

Dean and Vice Chancellor, School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology (Deemed to be University), NH-58, Modipuram, Meerut-250110, India

E-mail: vicechancellor@shobhitmeerut.ac.in; amarprakashgarg@yahoo.com

Bharat (India) is an agro-politically dominant country having 15 agro-climatic zones with diversified population and richest biodiversity. It is the primary source of livelihood of approximately 58% of its population (Indian Agriculture and Allied Industries Report, September 2019). Our agriculture accounts for approximately 17-18% of Indian's Gross Domestic Product (GDP). To fulfill the most ambitious goal of our Hon'ble Prime Minister for doubling farmer's income by 2022, Bharat needs to achieve 9-10% of GDP for which re-structure of agriculture is required. The Government needs to focus on agricultural infrastructure such as irrigation, soil, water, plant, farmer and animal health, post-harvest management, better warehousing, cold storage, and professionalism in marketing besides the diversification of traditional agriculture during 2017-18 crop year, the food grain production was estimated at record 284.83 million tones which rose to 285.2 million tons during 2018-19. Milk production was estimated 165.4 million tons during financial year 2017-18 while meat production was only 7.4 million tones. Bharat produced 314 million tons of horticultural crops during 2018-19 as per third advance estimates. During financial year 2018-19, agricultural exports were US$ 38.54 billion. Bharat is the largest producer, consumer and exporter of spices and its products which reached US$ 3.1 billion during 2017-18. Tea and coffee exports reached 240.68 million Kg and 395000 tons respectively during 2017-18.

Increasing use of chemical fertilizers and pesticides in agriculture may reduce the export of agricultural commodities in near future which requires a serious planning and management in view of the growing demands for organic foods throughout the world. Various western countries have banned the use of several pesticides, particularly systemic ones, as they contaminate the food, water, soil and environment. Recent studies have also revealed that the content of vitamin A is fully dependent on pollination. The pollinators are under threat and several species are extinct. It is suggested that use of agrochemicals should be limited in agriculture and organic farming should be promoted and the farmers be adequately educated. Organic farming, zero-budget natural farming, integrated pest management, intercropping, biological control, use of bio-fertilizers and bio-pesticides are the newer technologies that are environmental friendly and safe for human and animal consumptions. Several commercial bio-fertilizers and bio-pesticides have been launched by various companies in the market with a claim for high yield and control of plant diseases but the farmers are not satisfied with their claims due to non-promising results. The use of vermin-compost, organic manure / compost is the recommended remedy for maintenance of soil fertility and nutritive value of the food products. The carbon profile of soils of western Uttar Pradesh, Haryana, Punjab and Maharashtra are worst affected. Post-harvest losses in agriculture accounts for 20-30 % depending upon the type of crop products which are required to be managed scientifically and with good planning and better infrastructure. The major reason of farmer's dissatisfaction is, that he is not getting the right price of his perishable food crops for which it is suggested that "Cooperative Farmers Societies" should be promoted for "on spot" quality food

processing and marketing services should be provided by professionals so that the farmer may get the right price of his crop product. Our agriculture mainly depends upon irrigation and approximately 75-80% of total water consumption is on cultivation of various crops which is claimed to the depletion of ground water level. Hence, it is suggested that crops which require less water and modern irrigation technology like sprinkling should be used. For doubling the farmer's income, the cost of production is required to be reduced and the price of farmer's produce should be fixed at double the cost of its production.

Application of ZnO nanomaterials on Medicinal Black Rice

Ajit Varma and Shubhangi Mahajan
Amity Institute of Microbial Technology, Amity University Uttar Pradesh Noida
E-mail: ajitvarma@amity.edu

Black rice Oryza sativa is primarily grown in East and North East of India. This variety could not become popular due to low yield and being expensive. Four different kinds of ZnO nanomaterial were prepared at variable temperature ranging from 250˚C to 500˚C. The Interaction of black rice grain with nanozinc material leads to the observation that seeds germinated early. Rooting development was higher. Better effects were observed while those interacted with nanomaterial prepared at 350˚C. In the present study the aim was to enhance the yield and value addition. To best of our knowledge this is the first scientific attempt [see also patent filed Varma et al. 2019]. The mechanism involved needs further elaborate elucidation. We hope that the goal can also be achieved by interaction of seeds with mycosymbiont—*Piriformospora indica* (*Serendipita indica*) a potent cultivable mycorrhiza. The type of types of Anthocyanin Present in Black Rice

Black rice reflected three different types of pigments upon experimentation performed by employing HPLC. Out of three pigments detected, one was characterized as cyanidin-3-glucoside (C3G) and another was identified as cyanidin-fructoside.

Cyanidin-3-glucoside (C3G).

Malvidin 3-glucoside Malvidin is an anthocyanidin. As a primary plant pigment, its glycosides are highly abundant in nature. Slightly acidic and neutral solutions of Maldivian are characteristically of a red color, while basic solutions of Maldivian yield a blue color. Malvidin 3-glucoside is found in alcoholic beverages. Malvidin 3-glucoside is a pigment of skins of black grapes, also in other plants. Malvidin 3-glucoside is found in red wine.

Peonidin-3-glucoside Peonidin is an anthocyanidin and a primary plant pigment. Peonidin gives purplish-red hues to flowers such as the peony, from which it takes its name, and roses. It is also present in some blue flowers, such as the morning glory. Like most anthocyanidins it is pH sensitive, and changes from red to blue as pH rises.

Cultivated rice, which includes black and brown varieties, are all said to originate from the genus Oryza over 10,000 years ago. Wild rice is in fact wild, typically growing in shallow water in small lakes or slow-flowing streams. But it's actually not rice! Wild rice is technically a grain from a reed-like aquatic plant (*Zizania palustris*), which is not related to rice. Black rice is a rich source of phytonutrients, which

works as a natural detoxifier and pulls out disease causing free radicals from the body. Black rice is completely free of gluten. Anthocyanins, protects the body from free-radical damage which can lead to cancer. Uniqueness of the Novel (Nano Zinc Enabled Phosphorus Ameliorated) Black Rice Fortified Food Targeting Micro- and Macro-Nutritional Deficiencies in Malnourished Children: Black Rice fortified with anthocyanins and soluble fiber detoxifies and cleanses the human body apart from preventing episodes of bloating, diarrhea. Fortification of Black Rice with essential micronutrients Zinc and Phosphorus could significantly improve the growth patterns as well as Neuro-behavioral disturbances

Patent filed

Novel rice based fortified food targeting micro-and macro-nutritional deficiencies in malnourished children and women Date of Filing: 10.07.2019; Application No: 201911027612

Gladiolus cultivation in India and its impact on farmer's economy

Dr. Manoj Nazir
Scientist Floriculture (Directorate of Agriculture Jammu): President Garden Glory Human Empowerment: Chief Editor (CORM) International Journal of Floriculture
NAAS Rated: 1.72 and Chairman National Gladiolus Trust India
E-mail: editorgardenglory@gmail.com

Floriculture has become an important commercial activity in agriculture sector in the post globalization era. Floriculture activity has marked as a viable and profitable trade area with a potential to activate self-employment among low and middle income farmers, and earn the very essential foreign exchange in the developing countries such as India. The world floriculture production is growing at a rate of 10 per cent per year. Almost 45 to 50 countries are active in the production of Floriculture on a large scale. In terms of production value, the Thailand, Netherlands, USA, UK and China are in the top. The economic slowdown has affected the floriculture industry internationally with demand for floriculture products were declined in major countries, such as Europe, The USA and Japan. Depression in pricing has been observed across the product segments. The floriculture sector in India is facing several challenges at the production level mostly related to availability of basic inputs, proper irrigation and skilled manpower. At the marketing stage also Indian traders are facing major challenges related to product diversification and product differentiation. With increasing involvement of super markets in flower business, managing transport is also becoming a critical factor for the Indian flower traders.

Gladiolus cultivation under northern Indian plains, coastal areas of Tamil Nadu and Pondicherry has a potential to change the economic scenario of farmers of these areas. For generating both money as well as employment in rural areas gladiolus is such a crop suitable for establishing floriculture industry by progressive farmers and entrepreneurs and undoubtly the best bulbous flower in India. Its magnificent spikes in dazzling colours remain fresh for 10 to 22 days. Its cultivation in Northern region of India has become an important sector as consumption of flowers is rising associated with economic development. Jammu division of J and K and U.P has a wide range of climates and micro climates different production system, socio economic diversity and consumer requirements. Mostly farmers belong to small and

marginal category. Diversification to horticulture crops is now the major option to improve livelihood security of small farmers and improved employment opportunities. Jammu division of (J and K) U.P and coastal plains of India is going to play a vital role in floriculture trade which will turn the economy of these states. Floriculture scenario in Jammu province of (J and K) has changed very rapidly since 2000. In 1998 – 1999, area under gladiolus cultivation in Jammu province was 0.5 hects and it's reached to 2.0 hects. In 2002 and 5.0 hects in 2004 and 10.0 hects in 2007. Now every year 25 – 50 farmers take up its cultivation in Jammu region of J and K. In 1999 40,000 spikes of gladiolus were produced, from 1999 – 2002. 1, 00,000 spikes were produced. From 2002-2004. 1, 20,000 spikes were produced and from 2005-2007. 3, 00,000 spikes were produced from the plains of Jammu region (from October to April). Despite all this Jammu import 85% of gladiolus spikes and other cut flowers from rest of the country. Floriculture sector is experiencing a rapid change the world over the globalization and its effect on income generation. Consumption of gladiolus spikes in northern plains of India and coastal plains is rising day by day and this trend will continue to increase because of its demand in the market and improvement in purchasing power. A gladiolus spike has a potential to change economic scenario of poor farmers.

Major Constraints of Floriculture and their Remedies

Satya Prakash
Professor & Head, College of Horticulture
SVPUA&T, Meerut-250110
E-mail: satyaagro@gmail.com

Floriculture is the sub branch of Horticulture which deals flowers, production techniques, value additions, marketing and post-harvest management of flowers, bulbs and their production to promote the flower's growers.

Scope of Floriculture

Now a day's floriculture is fast emerging as a major venture on the world scenario. Flower cultivation is recognized as most remunerative profession with much higher potential for return per unit area than most of field crops.

Major Constraints Some: Major Constraints are given below: Unavailability of quality seeds & planting material. Poor Post Harvest Management resulting maximum post-harvest losses.

Remedies / Suggestions: Flower growers can be promoted by solve the constraints face by them. Some suggestions are given below; Availability of Quality Seeds and Plating Material: To promote the floriculture Quality seeds and planting materials are the most important things. Marigold, varieties release from IARI Pusa, New Delhi is much suitable for good return.

Gladiolus Growers can earn net profit 2.5 to 3.0 lakhs per/ha from Gladiolus cultivation, some cultivars are given below: White Prosperity(White), American Beauty (Red) and Eurovision (Dark Red)

Tuberose: Tuberose is planted in the month of March to June on based of purpose, market demand etc. Single varieties are used for essential oil abstraction and double varieties use for other purposes. Some cultivars are given below:

A. Single Varieties: Prajwal, Arka Nirantar
B. Double Varieties: Suwasini, Swarn Rekha, Double
Gerbera: Gerbera cultivation is profitable when its grown in poly house as protected cultivation. Growers can earn net profit 10.0 to 12.0 lakhs/ha from Gerbera cultivation, 24000 Gerbera plants required in 4000 sqm polyhouse.
Production Technology: Technology can be provided by giving the following methods:

- Technical Training Program should be conducted to flower growers.
- Production Technologies should be demonstrated at the Farmer's Field.

Flower Producing Group: To get the maximum return and easily marketing flower growers group should be promoted by the Government. and security should be insuring to flowers growers.
Marketing: For good return from Floriculture Marketing facilities should be provided to the growers by Government, A.C. Van. Flowers producer Organization (FPO) should be Farm.
Value Addition: To promote the growers Value Addition Training should be provided time to time for to control of post-harvest losses.

Sustainable Intensification of Agriculture and Farmer's Prosperity: Issues and Strategies

R. K. Gupta
Vice Chancellor
Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu Main campus, Chatha - 18009, J&K
E-mail: profrkgupta@rediffmail.com

Between 1960 and 2020, food grain production in the world increased at a higher rate in comparison to population growth. The green revolution drove this production growth with new high yielding dwarf fertilizer responsive varieties, farm inputs, water management and rural infrastructure. Most increases in food production were achieved on the same agricultural land. In future, alarming situation could arise due to various factors:

1. Water/ energy crunch
2. Reduced per capita availability of arable land
3. Increasing biotic/abiotic stress
4. Climate change and variability

There is a need to derive change to meet challenges through synergetic efforts by policy makers, scientists, agricultural experts and farmers Food and nutritional security needs of the future generations can be addressed through holistic approach while considering following parameters.

1. Judicial blending of traditional approaches with cutting edge technologies
2. Addressing needs of poor farmers and poor consumers.
3. Focus on enhancing farmer's income

High priority has to be given on enhancing productivity in sustainable manner, quality improvement and profitability using less land, water and other inputs. The strategic issues that need to be addressed include:

1. Diversification

2. Labour productivity
3. Marketing problems
4. Farmers prosperity

Conservative agriculture coupled with technological innovations, sound policies, stake holder's decision participation in decision making and equitable profit sharing can derive growth.

Sustainable Agriculture Intensification

a. Increasing production of existing farm lands

b. Increasing environmental sustainability

c. Natural resources management

Policy Issues

Policy-makers need to consider multiple goals for the food system in multifunctional landscapes with focus on synergies. Major areas that are debatable and require framing of road maps for diverse agro climatic regions and attention of policy makers on priority basis, are outlined as under:

1. Land use and Agro climatic planning
2. Biodiversity management
3. Climate change and variability
4. Productivity enhancement innovations
5. Credible emerging technologies use (biotechnology, information and management)
6. Rain fed agriculture technologies
7. Quality inputs (Seeds, fertilizers, irrigation, etc) availability at affordable costs)
8. Integrated water management
9. Integrated nutrient and pest management
10. Technological Interventions

A Conspectus on Herbal Medicine

Vijai Malik
Department of Botany, CCS University, Meerut
E-mail: gathwalajai@gmail.com

The term "herbal drugs" denotes plants or plant parts that have been converted into phyto pharmaceuticals by means of simple processes involving harvesting, drying and storage. Herbs include crude plant material, such as leaves, flowers, fruit, seeds, stems, wood, bark, roots, rhizomes or other plant parts, which may be entire, fragmented or powdered. Herbal materials include, in addition to herbs, fresh juices, gums, fixed oils, essential oils, resins and dry powders of herbs. In some countries, these materials may be processed by various local procedures, such as steaming, roasting or stir-baking with honey, alcoholic beverages or other materials. Herbal preparations are the basis for finished herbal products and may include powdered herbal materials, or extracts, tinctures and fatty oils of herbal materials. They are produced by extraction, fractionation, purification, concentration, or other physical or biological processes. They also include preparations made by steeping or heating herbal materials in alcoholic beverages and/or honey, or in other materials. According to an estimate in India, about 80%

of the rural population depends on medicinal herbs. Adulterants and substitutes are the common malpractices in herbal raw material trade. Such adulteration may be an intentional addition of foreign substances to increase the weight of the product or to decrease its cost. Many adulterations may be due to confusion in vernacular names, lack of knowledge about authentic plants, non-availability, similarity in morphology, activity, aroma, careless collection and other unknown reasons. The present discussion will deal all these problems. Synthetic products have side effects and because of which herbal medicines are gaining importance. Inspite of the two hotspots in India, it's the share in the global market is not upto mark. The present discussion will also deal the measures to be adopted for global promotion of Indian herbal products.

An Outline on Modern Approaches for Smart Agriculture

Y. Vimala
Department of Botany, CCS University, Meerut
E-mail: yvimala@ccsuniversity.ac.in

Government of India has initiated a policy for the corporate world previously and now in tune with that for the Scientific community and the University/Institutional set up to realize the Social Responsibility (CSR/SSR/ISR). The aim is to direct all potential people to contribute in national upliftment by realizing their social responsibilities towards the rural masses. People of India mainly dwelled on its agriculture, which after green revolution has come to a point of search for alternative strategies. In this wake, it is necessary to make agricultural sector self- sustaining through use of modern techniques and judicious management of existing land. The weeds or invasive plants of the croplands may be used for secondary agricultural produce along with knowledge of allelopathic interactions, besides use of nano-bio-fertilizers for improvement and biocontrol of enemies of crop plants and tree species growing in the fields. The change in crop cycle due to transitions in basic climate, needs to be addressed carefully and choice of sowing or harvesting time, crop and variety needs to be revisited.

Advances in Post Harvest Handling and Value Addition of Fruits and Vegetables

Prof. Samsher
Dean, College of Post Harvest Technology & food Processing
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut – 250110
E-mail: samsher_23@yahoo.co.in

India is the second largest producer of both fruits and vegetables. Fruits and vegetables are the reservoir of vital nutrients. Being highly perishable, 20-40% of the total production of fruits and vegetables goes waste from the time of harvesting till they reach the consumers. It is, therefore, necessary to make them available for consumption throughout the year in processed or preserved form and to save the sizeable amount of losses. Fruits and vegetables have great potential for value addition and diversification to

give boost to food industry, create employment opportunities and give better returns to the farmers. Reduction of post-harvest losses also reduces the cost of production, trade and distribution, lowers the price for the consumer and increases the farmer's income. Production practices have a tremendous effect on quality of fruits and vegetables at harvest and post-harvest quality and shelf life. When the fruit and vegetable are maturing in the field they change their form day to day. There is a time when the fruits and vegetable will be at peak quality from the stand-point of colour, texture and flavour. After the fruit and vegetable is harvested it may quickly pass beyond the peak quality condition. Production of heat is also the reason when large stockpiles of fruits and vegetables are transported or held prior to processing. Since the heat further deteriorates the fruits and vegetables and speeds micro-organism growth, the harvested fruits and vegetables must be cooled if not processed immediately. However, cooling only slows down the rate of deterioration, it does not prevent it. Each fruit and vegetable has its optimum cold storage temperature which may be between about 0-10^0 C (32-50^0 F). Management practices can also effect post-harvest quality. This paper discussed various aspects of post-harvest handling and value addition of fruits and vegetables.

Phycological Gateway for Agricultural and Environmental Heath Reclamation

S K Bhatnagar
Formerly Dean, College of Biotechnology, Sardar Vallabhbhai Patel University of Agriculture & Technology, Modipuram, Meerut Editor in Chief, **VEGETOS**
E-mail: drskb2000@yahoo.com and subodhbhatnagar18@gmail.com

Decades after the discrimination, various strains of microphytic and macrophytic algae have been identified as the feedstock of great utility. Algae, being an autotroph is capable of transforming good amount of solar energy into biomass. This biomass is stored in the form of carbohydrates, single cell proteins, fatty acids, vitamins, carotenoids, antioxidants, pigments, PUFAs and a large number of pharmaceutical and nutraceutical products.

Excessive use of chemical fertilizers, biocides against pests, herbs, and weeds for enhancing agriculture production is leading to severe health hazards and therefore the process of using algae as bio-fertilizer and bio-inoculant for organic food production was explored. Though not being adopted much, cyanobacteria, the potential source of nitrogen fixation can be of great potential for soil reclamation and enhancement of agricultural productivity.

Cyanobacterial strains containing mucilaginous sheath around them can also be used for developing prophylaxis and defense mechanism in major crop varieties which are threatened by the attack of hazardous pathogens.

On the other hand, receding fossil fuel reserves can be compensated to some extent by producing algae biofuel. The need of environment friendly biodiesel extracted from high fatty acid algal strains will be used as green energy and will sequester carbon emission. For various industries who invest quantum of money for installing carbon sequester to meet NGT requirement can develop photo bioreactor to grow algal strains so as to channelize fluke gases and to generate feedstock for biodiesel production and other useful bi-products. Big contribution to science will be if our new generation of scientists take up these

tasks and help in enhancing agricultural production leading to farmer's prosperity and to create a stock of green energy for reducing environmental pollution.

Exploitation of PGPR for Management of Soil-borne Fungal Pathogens

R.C. Dubey
Department of Botant& Microbiology
GurukulKangri University, Haridwar- 249404
E-mail: profrcdubey@gmail.com

The green revolution of agriculture brought an enormous increase in food production; but the productivity levels have remained low. The increased yield was achieved at a cost of intensive use of water, fertilizer and other inputs which have caused problems of soil salinity, ground water pollution, nutrient imbalances, emergence of new pest and diseases and environmental degradation. Application of the diverse bacterial species of 'plant growth promoting rhizobacteria' (PGPR) represents an ecologically and economically sustainable strategy. In recent years, the use of these bio-resources for the enhancement of crop productivity is gaining importance worldwide.

Among the various antagonists used for the management of plant diseases, plant growth promoting rhizobacteria (PGPR) play a vital role. There are two types of PGPR, intracellular PGPR (iPGPR) (*i.e.* bacteria that live inside plant cells and being localized in the nodules), and extracellular PGPR (ePGPR) (*i.e.* bacteria that live outside plant cells and enhance plant growth through the production of signal compounds that directly stimulate plant growth to the improvement of plant disease resistance or to the mobilization of soil nutrients to the plant). The ePGPR can be subdivided into three types based on the degree of association with plant roots: *(i)* bacteria living near but not in contact with the roots, *(ii)* bacteria colonizing the root surface, and *(iii)* those living in the spaces between cells of the root cortex. Rhizosphere and endophytic PGPR promote plant growth via metabolisingphytohormones in the rhizosphere and the production of stress-protective compounds. PGPR-mediation of plant hormone status has local effects on root elongation and architecture.

The mechanisms of plant growth-promotion by the PGPR have not been completely elucidated but the important mechanisms are categorized into the direct and indirect plant growth-promoting mechanisms. PGPR stimulate plant growth either directly or indirectly or both. The direct plant growth-promoting mechanisms include N_2 fixation, solubilization of minerals such as phosphorus, production of siderophore that solubilize and sequester iron, production of plant growth regulators (hormones) that enhance plant growth at various stages of development. The indirect plant growth-promotion occurs when PGPR promote plant growth by improving growth-restricting conditions.

Fluorescent pseudomonads have revolutionized the field of biological control of soil-borne plant pathogens. Fluorescent pseudomonads have been implicated in the control of several wilt diseases of important crops like wheat, legumes, cucumber, charcoal rot of economic crop plants caused by *Macrophomina phaseolina*, red rot of sugarcane caused by *Colletotrichum falcatum*, etc. By using PGPR in soil via seed bacterization, enhanced seed germination, seedling viability, increased plant growth and yield along with increased population of PGPR on root surfaces with biocontrol potential

have been reported against several phytopathogens such as *Fusarium oxysporum, Macrophomina phaseolina, Sclerotium rolfsii, Sclerotinia sclerotiorum, Rhizoctonial solanii*, etc. In addition, after seed-bacterization on one crop bythePGPRs, long-term effects on yield of subsequent crops have also been reported.

Critical Study of Impact of Quantifiable Variables on the Yield Per Hectare in the Indian Agricultural Sector

Paresh Shah
M.Com.,LL.B.,D.B.M.,FCMA.,A.A.S.M.,Ph.D.,FDP(IIMA)
Accredited Management Teacher and Researcher,
E-mail: profpareshshah@yahoo.co.in
paresh@profparesh.in

Agriculture has been the locomotive for economic growth in India. The agriculture growth and development are depending on the proper utilization of resources. Historical and today's era, the infrastructural supports by Government of India, and State Government, played a role in significant way. Researcher has tried to study the data in quantitative form (not in monetary term) available from different government's reports, etc. Researcher has considered the data from the period of 2000-2001 to 2014-15, and used SPSS 22 for statistical analysis. The dependent variables considered are the yield per hectare, and production of food gains. Independent variables are: 1. Population Density per square kilometer, 2. Cropping intensity in terms of percentage, 3. Poverty rates – persons per million, and 5. Gross irrigated area in thousand hectares. The five hypotheses are being developed to establish the relationship between two variables. To frame the conclusive result, multi-linear based hypothesis is developed. The conclusion supports that the yield per hectare is 64% dependent on gross irrigated land area and crop density. The conclusions have supported the null hypothesis between yield per hectare, crop density and poverty rate. Alternate hypothesis has been accepted between yield per hectare and gross irrigation land area. Hence, it can be suggested that, government direct interference in infrastructural support would be quite helpful to enhance the agricultural output.

Chemical Free alternatives for Pest Management

Neeraj Maheshwari
Deputy Manager -Dayal Seed
Dayal Seeds (P) Limited.Delhi Road,Partapur, Meerut,Up 250 103
E-mail: neeraj.maheshwari@dayalgroup.com

Immediately after World War II, the success of dichlorodiphenyltrichloroethane (DDT) and 2,4-dichlorophenoxyacetic acid (2,4-D) emphasized the development of synthetic pesticides and their extensive use in agriculture. However, their deleterious effects on the environment and in agriculture

soon proposed the need for corrective measures to attain sustainable agriculture and environmental safety. Biocontrol eventually attained global preference over synthetic pesticides for being an effective means to suppress the population of insect pests. During the past two decades, steady progress has been made worldwide to safeguard crops from insect pests through the use and manipulation of biocontrol agents/natural enemies. Still, there is an increasing demand to search more natural enemies (viz., predators, parasites, and pathogens) and assess their efficacy against various agricultural pests. Despite a growing demand for biocontrol agents, major populations of the world, especially those of developing nations, are still unaware about the different biocontrol methods. Moreover, only recently have scientists, practitioners and entrepreneurs attempted to assign economic value to biocontrol.

There's a whole range of what we call biological pesticides, or "bio-pesticides," that are made of naturally occurring predators, parasites and pathogens. The great news about bio-agents/bio-pesticides is that they are virtually non-toxic to people and the environment. They usually target specific pests, reducing risks to beneficial insects, birds and mammals. Even better, they're becoming more common – and that means that safer alternatives to control pests are becoming more widely available. Bio-agents/ Bio-pesticides have long been used in organic farming, but their use in conventional farming is growing now as well. We (Dayal Group limited) created a new Param Division focused on raising the profile of bio-agents/bio-pesticides and helping farmers by mass producing and supplying quality bio-products for sustainable chemical free agriculture. Our more efficient bio-agents/ bio-pesticides/pheromones helps keep up with demand. We're helping agriculture to shift towards the various products of chemical free alternatives, and minimizing risks to people and the environment.

CRISPR Technology for Crop Improvement: Present Scenario and Future Prospects

Neelesh Kapoor
Department of Fingerprinting, College of Biotechnology, SardarVallabbhai Patel University of Agriculture & Technology, Meerut- 250110 (U.P.) India
E-mail: drneeleshbiotech@gmail.com

The worldwide demand for high-quality improved crops is continuously rising with time. Crop improvement methods have a long history and they had been practical since the establishment of domestication of the first agricultural plants. Advancements in Genome editing technologies such as zinc finger nucleases (ZFNs), transcription activator-like effector nucleases (TALENs) have revolutionized the fields offunctional genomics and crop improvement. Discovery of the Clustered Regularly-Interspaced Short Palindromic Repeats (CRISPR), the mechanism of the CRISPR based prokaryotic adaptive immune system (CRISPR/Cas9), and its repurposing into a potent genetic engineering tool has revolutionized the field of molecular biology to more precisely target any gene of interest.

CRISPR/Cas9 technology relies on the complementarity of the guideRNA (gRNA) to a specificsequence and the Cas9 endonuclease activity. This involves simple designing and cloning methods, withthe same Cas9 being potentially available for exploit with diverse guide RNAs

targetingmultiple sites in the genome. Several modified Cas9 cassettes for e.g., Nmcas9, Stcas9 etc. have been explored in crop plants for improving target specificity and dipping off-target cleavage. CRISPR/Cas9 genome editing has broadened the agricultural research area, bringing in new opportunities to develop novel crop varieties with addition of significant characters and/or deletion of detrimental traits. Application of these technologies will consequence in the development of non-genetically modified (Non-GMO) crops with the desired attribute that can contribute to increased yield potential under biotic and abiotic stress conditions.

Digitalized Agricultural System: An Epitome of SMART Irrigated Farming, SMART Rain fed Farming & SMART Tribal Farming

M. Moni
Professor Emeritus & Chairman
Centre for Agricultural Informatics and e-Governance Research Studies (CARIS)
Shobhit Institute of Engineering & Technology, Meerut (A NAAC Accredited Deemed to-be University) Meerut, Uttar Pradesh
E-mail: moni@shobhituniversity.ac.in

The Doubling Farmers' Income by 2022 (DFI-2022) Committee Report (2018) has suggested, in its Volume-12B, strategic use of Digital Technology in Farming System Life Cycle, through seven DFI-2022 Mission Mode Programmes, out of which one programme is towards achieving SMART Irrigated Farming, SMART Rainfed Farming and SMART Tribal Farming, by synergising various transformational programmes viz., Digital India, Make in India, Skill India, StandUp India and StartUps India, for sustainable farming sector. This amounts to developing a launch pad for achieving Agriculture 4.0, in the similar lines of Industry 4.0 technologies and applications, by 2022. More than 130 Million farmers, more than 85 per cent being small and marginal farmers, are involved in farming activities in India. Farming is one of oldest economic activities in the Country, providing more employment opportunity than any other sectors. India has delineated its geographical area into 15 Agro-climatic regions and more than 127 Agro-Climatic Zones, having different farming practices, evolved over the centuries, with changes in weather and climatic conditions, technological innovations and socio-cultural practices. Irrigated farming is practiced with assured water supply from sources of irrigation (canals, tanks and wells)Rural India requires "e-Governance in Farming System" as a Citizen Charter, to overcome rural distress to a greater extent. Disciplines such as Genomics, Robotics, Informatics and Nanotechnology (GRIN), as an integrated approach, are finding their progressive relevance in farming sector as "Future of Agriculture". This approach will facilitate generating productive employment opportunities through skill and entrepreneurship development (Agri StartUps) to empower farming cultivators and stakeholders. Digital Technologies – Block Chain, IOT, Artificial Intelligence (ML & DL), BigData Analytics, GIS, Smart Phone, Internet, Cloud Computing and Language computing – facilitate farming community empowered, progressively, through the newly evolving Agricultural Informatics discipline. This paper deals with a comprehensive SWOT analysis in digitalisation of

agriculture in general, and an action plan to bridge development gaps for human resources in particular, in Rural India, for achieving Resource Use Efficiency (RUE) through SMART Farming in Irrigated Area, Rainfed Area and Tribal Area.

A Smart Farming Approach to Agriculture

S. M. Mohamed Ismail
Member of Parliament
Democratic Socialist Republic of Sri Lanka
Ex-Vice Chancellor of South Eastern University of Sri Lanka
E-mail: ismaakmal@yahoo.co.uk

Smart farming is a growing topic on current agricultural world. It is a concept of farming management using modern Information and Communication Technologies to increase the quantity and quality of products. With smart technology, today's farmers can manage their farm from a laptop to remotely control GPS-installed tractors and instruct distant crop watering systems to turn on and off. In the fields, sensors can be attached for measuring soil and air temperature and moisture as well as drones and satellites for collecting and analyzing data which provide information on how farmers fertilize and care for their crops. Smart farming envisages the harnessing of Information and Communication Technologies as an enabler of more efficient, productive, and profitable farming enterprises. Such technologies do not suffice on their own; rather they must be judiciously combined to deliver meaningful information in near real-time.

In short, we can analyze the multiple technologies available for present-day farmers. Sensing technologies, including soil scanning, water, light, humidity, temperature management; Software applications — specialized software solutions that target specific farm types; Communication technologies, such as cellular communication; Positioning technologies, including GPS; Hardware and software systems that enable IoT-based solutions, robotics and automation; and Data analytics, that underlies the decision making and prediction processes.

Drones are capturing the imagination of modern farmers. Gaze up into the sky in farming areas of Europe and the US, and you just might see a drone flying overhead, collecting data for use by researchers and farmers. Ideally, agronomists and researchers want drones to collect data several times in a season to ensure they make well-informed decisions. Reliable data will comprise a wide range of indicators, including biomass, chlorophyll rate, and leaf area index, and emergence rate, water stress, missing plants, height or flowering.

When we considering the applications of IoT there are two big spheres where IoT systems can revolutionize agriculture: precision farming and farming automation/robotization. Precision farming, or precision agriculture, is an umbrella notion for IoT-based approaches that make farming more controlled and accurate. In simple words, plants and cattle get precisely the treatment they need, determined with great accuracy. The biggest difference from the classical approach is that precision farming allows decisions to be made per square meter or even per plant/animal rather than for a field.

A smart sensing system and smart irrigator system through wireless communication technology is also an efficient tool in farming which measure of physical parameters such as soil moisture content, nutrient content, and pH of the soil that plays a vital role in farming activities. Based on the essential physical and chemical parameters of the soil measured, the required quantity of green manure, compost, and water is splashed on the crops using a smart irrigator, which is mounted on a movable overhead crane system. The detailed modeling and control strategies of a smart irrigator and smart farming system are practiced.

It is clear that smart farming taking over the agriculture based upon the combined application of Information and Communication Technologies such as precision equipment, the Internet of Things, sensors and actuators, geo-positioning systems, Big Data, Unmanned Aerial Vehicles (UAVs, drones), robotics, etc. In the future smart technologies has major power and can enable better agriculture. Therefore Smart Farming has a real potential to deliver a more productive and sustainable agricultural production, based on a more precise and resource-efficient approach. And its visible that In the future by this smart farming revolution, pesticide and fertilizer use will drop while overall efficiency will be optimized. I hope you all had an idea and the role of smart farming and how the approach improves agricultural needs in today's world.

A sustainable model for strengthening Indian agrarian economy

Dr Satyen Yadav, Dr Ishan Yadav
Centre for Agribusiness & Disaster Management
Shobhit University House, Noida 201301
Delhi NCR Region
E-mail: president@hpmi.org.in

An integrated sustainable model to strengthen Indian Agrarian Economy and taking Indian to Global leadership in Agriculture & Food has been developed based on various researches, trialsand market research. The model is based on Indian Cows (GAY), Indian River (Ganga) and Indian Villages (Gao) and hence called G3. G3 model is a self-sustainable integrated agribusiness model for the strengthening of rural economy adopting "farm to energy" concept under participatory mode with a win-win situation for all the stake holders of the shortest vale chain. This model has the potential to transform the country's agrarian economy and it can easily be replicated. This model will empower farmers, agri prenureship by a well-defined "three fold program" i.e.to increase the productivity, to provide additional income option agribusiness options and agri prenureship development.

Evidence-based Herbal Medicine Research to Address Emerging Global Health Issues

Rajesh Arora
Defence Research and Development Organization (DRDO)
DIPAS, Lucknow Road, Timarpur, Delhi-110054, India
E-mail: rajesharoratejas@gmail.com

Disease prevention and treatment are paramount for survival and sustenance of humans and consequently herbal medicine evolved primarily as a result of the necessity to prevent and treat diseases. The World Health Organization acknowledges that herbal medicine still caters to the needs of approximately 80% of the population in the developing world. Herbal medicine finds use in almost every country in the form of Ayurveda, Traditional Chinese Medicine, Tibetan Medicine, Korean traditional medicine etc. as it is affordable, easily accessible and acceptable to all sections of society. Addressing the health needs of nearly 7.8 billion people, majority of whom reside in developing/underdeveloped countries where the population cannot afford costly healthcare, has necessitated the revival of herbal medicine. Besides, the disease preventive as well as curative aspects of herbal medicine, its safety and efficacy proved over thousands of years, have made it a preferred choice amongst the masses. Effective and holistic treatment for several diseases like cancer, AIDS, emerging and re-emerging bacterial, fungal and viral diseases like SARS coronavirus (SARS-CoV), Middle East Respiratory Syndrome (MERS-CoV), novel coronavirus (2019-nCoV), Alzheimer's, Parkinson's and several emerging and re-emerging diseases are still not available in modern systems of medicine. Ever since life has originated on this planet, overall well-being and health has been a major concern for all life forms. On the one hand, evolutionarily there have been genetic and epigenetic changes that have shaped life forms and also posed challenges. On the other spectrum there have been physiological challenges and a constant war between pathogens and other life forms for survival. Plants, animals and humans have constantly struggled to counter pathogenic insults and sometimes the host is successful and vice versa. Herbals have been the source of several modern drugs either directly or indirectly e.g., via synthesis of nature-identical compounds. The FDA approved drug Oseltamivir (Tamiflu) is the first orally available neuraminidase inhibitor and has been found to be useful for the treatment of novel H1N1 (swine flu) was initially derived from *Illiciumverum* Hook.f. (Chinese Star Anise).Similarly, prevention against the deleterious effects of ionizing radiation has been an area of focus. Evidence-based phyto medicine has been the basis to solve some of humanity's complex problems posed by today's volatile, uncertain, complex and ambiguous environment. Improving soldier performance and taking care of health and well-being is a priority mandate for us. Several readily usable, need adaptable, customized and flexible human-centric technologies that are user-friendly and easy to use have been developed by our group. Incidentally, the spin offs emanating from such research have also led to immense societal benefits. The lecture will provide a bird's eye view of some such innovative technologies developed and successfully implemented in the service of the Nation.

Mannan Oligosaccharide from Plants and Yeast as an Important Radiation Counter Measure Agent

Damodar Gupta, Sweta Sanguri
Department of Capacity Enhancement and Product Induction, Institute of Nuclear Medicine and Allied Sciences, Defence Research and Development Organization, Timarpur, Delhi, India.
E-mail: damodar@inmas.drdo.in

Mannan Oligosaccharide is an important TLR agonist that have been reported to possess antitumor effects and have been tested in different cancer cell lines and mice models. It has also been shown to possess anti-oxidative, anti-genotoxic and anti-mutagenic properties. Linear chains of β-(1–4) mannan are found in the seed endosperms of certain plant species, like ivory nut and coffee beanetc and cell walls of some plant species. Mannan is also a constituent of bacterial, plant and yeast cell wall with differences in the branches or glycosidic linkages in the linear structure. It has been commercially isolated from several species of yeast. Most TLR ligands have an ability to activate NFκB pathway and reduce radiation-induced cell death in various tissues.

In recent years, numerous radiation countermeasure agents have been reported, some of which are efficient but relatively toxic. We have recently shown, mannan as a potential modulator of biological effects of gamma radiation both at *in vitro* and *in vivo* levels. We have shown that mannan pretreatment in immortalized normal cells reduces biological effects of γ-radiation and enhances the cell survival. We tried to utilize properties of mannan oligosaccharide (MOS) both on normal and transformed cells to understand changes in biological radiation responses and radiation protection. We have shown that, mannan pretreatment to normal cells restore the radiation induced changes in mitochondrial dynamics in normal cells. It induces alterations in mitochondrial physiology in immortalized normal cells and thereby reduces biological effects of γ-radiation and enhances the cell survival.

MOS is shown to possess gastrointestinal and immunological responses in organisms including, farm animals, cattle's, fishes, chicken etc. There are reports of improved health, growth status, and enhanced performance, resurgence of the systemic and local immune system in animals. Since, TLRs have been reported to express in humans and mice, we intended to utilize the benefits of MOS supplementation against radiation induced acute radiation syndrome (ARS). Therefore, we investigated the effects of mannan pretreatment on IR-induced injury in different age groups of BALB/c mice (when administered 2 hours prior to total body irradiation. Results demonstrate that mannan ameliorates the radiation-induced damage to the GI system thereby, facilitates recovery leading to enhanced animal survival demonstrating its protection efficacy against TBI induced mortality.

Role of Solar Energy for Sustainable Agriculture

Dr. Dinesh K. Sharma
Deputy Director
National Ecology and Environment Foundation (NEEF)
Mumbai-400063 (INDIA)
E-mail: deputydirector@neef.in

Solar Energy is not new for agriculture. It is also evident that the solar energy (sunlight) is one of the most important and unignorable element for any agricultural production in any part of the world. The sunlight that reaches Earth each day is immense which can be understood by the fact that 20 days of sunlight can provide all energy available in Earth's reserves of coal, oil, and natural gas. Solar energy can be useful in agriculture (or farming) in many ways which includes cost effectiveness, self dependency, reduced climate change and sustainability.

Solar energy can also generate electricity. Solar PV panels are proved to be an economical choice rather new transmission lines for providing power to remote agricultural locations. Another benefit of solar PV system is that they need very less operating cost and with no moving parts as compared with diesel generators. Solar lantern (using stored solar PV electricity) can also be used for providing light during night in agricultural farms and nearby areas. Solar electricity-based fencing (for keeping animals away from farms) and insect/pest attractors (for keeping insects away from crops) are also eye-catching examples of solar energy application in sustainable agriculture. Sunlight based crop drying is one of the classical applications in agriculture. The crops dried using solar dryer is being prevented from any sort of damage by pests, birds, animals or raining. Solar energy can also be used to maintain a greenhouse which is able to provide required heat for required growth of crops or plants. A proper insulation is being also used to retain heat for using it on cloudy or rainy days and during night time. Solar greenhouse is generally south facing and proper insulation is provided on its northern side

In this paper, some of the solar energy applications has been briefly discussed for making farming efficient and cost effective. Furthermore, Solar energy based agricultural applications are quite helpful in meeting sustainable development goals (SDGs).

Preliminary characterization of multilaminar bodies producing amoeba mutants

Kumari Archana
Institut de Biologie Intégrative et des Systèmes, Université Laval, Québec, Canada
Centre de recherche de l'institut universitaire de cardiologie
et de pneumologie de Québec (CRIUCPQ), Canada
Département de biochimie, microbiologie et bio-informatique, Université Laval, Québec, Canada

Amoeba chase and eat bacteria in their environment. At the end of this process, multilamellar bodies (MLBs), which are mainly composed of membranous material, are produced and secreted. It has been proposed that MLB secretion is a waste disposal system allowing the amoebia to eliminate undigested

bacterial remains. *Dictyostelium discoideum* is a soil amoeba and also a bacterial predator that internalizes its preys through phagocytosis. During this process multilamellar bodies (MLBs) production and secretion have been demonstrated. These MLBs ranging from about 0.5 to 2 µm are produced in *D. discoideum*'s in lysosomes and post-lysosomes of the endocytic pathway concomitant to the digestion of ingested bacteria. Then post-lysosomes containing MLBs fuse with the plasma membrane to allow the secretion of these structures.

Some protozoa secrete pathogenic bacteria packaged in MLBs that protect them from unfavorable environmental conditions and biocide treatments. MLBs containing viable bacteria are also called extracellular vesicles (EV). These structures are produced only when amoebae feed on bacteria. Bacteria found in EV are considered as amoeba resisting bacteria (ARB). The packaging phenomenon appears to be a general phenomenon since many bacteria, including Mycobacterium spp., Parachlamydia acanthamoeba and foodborne pathogens such as E. coli O157:H7, Listeria monocytogenes, and Salmonella enterica can be packaged and secreted in EV by various protozoa. Multilamellar bodies (MLBs) are specialized lipid storage or secretory organelles of lysosomal origin. In cells, they are surrounded by a membrane and have a core composed of multiple concentric membrane layers. MLBs vary from 0.1 to over 2 m in diameter. In mammals, many cell types produce MLBs and, in many cases, the MLBs are secreted. While secreted MLBs play various physiological roles, they are mainly a source of specialized lipid components required for tissue protection and function.

In the present work, *D. discoideum* DH1-10 cells (Cornillon, *et al.*, 2000) were grown at 21°C in HL5 medium (Mercanti, *et al.*, 2006) added with 15 µg/mL of tetracycline. Cells were subcultured twice a week in fresh medium to prevent confluence of the cell culture. Alternatively, amoeba cells were grown on bacterial lawn as described below. *Klebsiella aerogenes* bacteria were grown on LB-agar at 37°C typically for two days before they were used for bacteria-amoeba co-culture. Klebsiella aerogenes fresh culture (OD 1), dissolved in HL5 medium. Made lawn of Klebsiella aerogenes on HL5 medium agar plate and kept to made it dry in sterile condition. After dry the lawn, 10 ul D. discoideum DH1-10 cells droped onto the dry Klebsiella aerogenes medium plate. Incubated at 21°C for 48 to 72 h (sometime more time needed).

Peri-Urban Landscaping - Emerging innovation in sustainable development

R. H. Dahiya
Prof. Horticulture, President Jayoti Vidyapeeth Women's University, Jaipur (Raj)
E-mail: dahiyarouhi@gmail.com

Peri-urban are areas that transits rural to urban land uses and generally located between the outer limits of urban and regional centers and the rural environment. The boundaries of peri-urban areas are porous and transitory as urban development extends into rural and industrial land. There are always growing concerns about water and food security to meet increases in population in urban areas. For cities to be liveable and sustainable into the future, there is a need to maintain the natural resources and the ecosystem services in the peri-urban areas surrounding cities. Development

of peri-urban areas involves the conversion of rural lands to residential use, closer subdivision, fragmentation and a changing mix of urban and rural activities and functions. Changes within these areas can have significant impacts upon agricultural uses and productivity, environmental amenity and natural habitat, supply and quality of water and water and energy consumption.

These changes affect the Peri-urban areas and the associated urban and rural environments. In the past, cities and towns have been established in areas that had secure water and energy supplies and fertile lands for food production. The ever increasing population growth and expansion of urban centers has placed increasing pressure on potable water supplies, energy and food supplies and the ecosystems on which the community liveability depend. Peri-urban landscaping can be described as the landscape interface between town and country or as the rural — urban transition zone where urban and rural uses mix and often clash. It can thus be viewed as a landscape type in its own right. As a specific and non-neutral space, landscape features are subject to rapid modifications, inducing by human activities.

Importance of Horticulture in Health Benefit and Value Addition Industry

Yogesh Prasad Rajbhar, Manoj Kumar, Ajay Kumar Yadav, Shiwanand Pandey, Anuj Pal, Prabhat Pandey and Veersain
Department of Fruit Science, Research Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut-250110 U.P. (India)
E-mail: rajbhar.yogesh@gmail.com

India is blessed with diverse agro-climatic conditions; those are conducive for cultivation of varied Horticultural crops round the year. As a result of focused attention, Indian Horticulture has acquired a prominent place in the world Horticulture map with all time high total annual production resulting 305.42 million tonnes from an area of 24.91 million hectares (Area and Production of Horticultural Crops 2017-18, NHB). India has a large range of varieties of fruits in its basket and accounts for 10 per cent of the world's total fruit production. Mango, banana, citrus, pineapple, papaya, guava, sapota, jackfruit, litchi and grapes among the tropical and subtropical fruits; apple, pear, peach, plum, apricot, almond and walnut among the temperate fruits and aonla, bael, pomegranate, annona, fig, phalsa among the arid zone fruits. India leads the world in the production of mango, banana, sapota and acid lime and in productivity of grapes per unit land area. India is the largest producer of mango, banana, chiku and acid lime. About 39 per cent of the world's mango and 23 per cent of the world's banana is produced in the country.

ECOSYSTEM DIVERSITY

Diversification leads to:

Extended fruit season, sustains our fruit markets, Lower the risk factor in fruit growing.

INTENSIVE HORTICULTURE

1. Tree size, precocity, growth and ripening time can be best utilized,
2. Proper utilization of our land resources
3. Boosting the economic status of orchardists

VERTICAL EXPANSION OF HORTICULTURE

1. Low stand crops can be grown on the surface.
2. Fruit crops with high vigour and vertical growth can be grown for utilizing the vertical space.

ISSUES ON DIVERSIFICATION IN FRUIT CROPS

- To sustain the fruit production
- To regulate the orchard income
- To increase the availability offruits for longer period
- To overcome the effect of changing climate

Fruits, undoubtedly constitute the oldest food of human kind. In fact, various edible plants grew wild millions of years before the advent of humanity and were an integral part of human environment before and during the dawn of civilization.

Global Scenario of Entomopathogenic Nematodes and their Prospects in Sustenance of Indian Agriculture

Ashok Kumar Chaubey
Nematology Laboratory, Department of Zoology, Ch. Charan Singh University, Meerut
E-mail: akc.nema@gmail.com

India has an agrarian economy, where 1012.4 million populations are dependent on agricultural commodities from 124.07 million hectares cropped area cultivated by 110.7 million producers and contributed 17–18% to country's GDP. Over 85% of rural households depend on agriculture as their principal means of livelihood. Most of the agro-products are damaged by lots of pests. In India, estimated crop losses due to the pest are worth of 6000 crores annually in which Insects contributing ~20%. Problem can easily be assessed viz. *Helicoverpa armigera* alone losses to the tune of 1,000 crores in crops like cotton, tomato, pigeon pea, groundnut, sorghum, pearl, millet and other crops of economic importance. It has been estimated that about 1200 crore worth of pesticides were used in India to control the bollworm complex of cotton. To reduce global crop losses, it has been estimated that around $40 billion are used annually worldwide for the application of 3 million metric tons of pesticides plus the use of various biological and other non-chemical controls worldwide. Pests acquired resistance to pesticides leading to the heavy crop loss. Occasionally farmers are confronted with a pest that can no longer be control with the available chemical solutions. To minimize the use of pesticides, it is required to find out such control measures that could reduce not only the application of huge quantity of the pesticides but also could be eco-friendly. Two of the prominent nemic genera i.e. *Steinernema* and *Heterorhabditis* having interaction with insects and are considered globally as highly pathogenic to insects. Such nemarodes are termed as Entomopathogenic nematodes (EPN) which can be used as biopesticide against the insect pests.

Oral/Invited Talks

&

Poster Presentations

SAG-101

Need of Green Supply Chain for attaining Sustainability in Agriculture Products

R. B. Singh and Ms. Akshika Rastogi
CCS University, Meerut
E-mail: akshikastats@gmail.com

In our daily life agriculture products are closest to us and so the concern of quality and nutrition of a product is very high. In the last decades Green Supply Chain has left a remarkable influence on agriculture. It has now become a necessity and a responsibility to enhance green supply in the processing of Agriculture product so as to lead toward sustainability. There is need of green supply to improve the quality of product, improving the use of resources and energy and to improve the productivity cost. By taking care of reverse logistic and information technology in their farming practices can improve a lot in their farming. This paper aims to introduce green supply management and the role of reverse logistic and I.T in farming.

SAG-102

PGPR *Erwinia*: An Alternative of Chemical Fertilizer

Anita Raisagar[1] and Sangeeta Shukla[2]
[1]Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj (U.P.)
[2]Deptt. of Dairy Microbiology, WCDT, Sam Higginbottom University of Agriculture Technology & Sciences, Prayagraj, (U.P.)

Different chemical fertilizers are used in agriculture to increase crop yield, to protect the crop from disease and to provide nutrition to the crop but these fertilizers also have adverse effect on environment such as it may cause soil and air pollution and effects soil fertility negatively. PGPRs might be used as alternative for these chemical fertilizers as an environmental friendly and smart agriculture approach. PGPRs are a heterogeneous group of rhizospheric bacteria that directly or indirectly improve the quality of plant growth. PGPRs are able to produce siderophore, ammonia, IAA and other compounds which affect plant growth. Siderophore is iron chelating compound which are used by plants in iron deficiency condition. IAA stimulated plant growth by breaking apical dominance and increase growth of main stem. Ammonia acts as fungi inhibitor in soil. In the present study rhizospheric soil was used as sample for isolation of PGPR isolate. The isolate was screened for PGP activity and showed ammonia, IAA and siderophore production along with antimicrobial property. Antimicrobial potential was determined against fungal plant pathogens *Fusarium oxysporum* and *Alternaria solani* by agar well diffusion method and measured 48mm and 45mm zone of inhibition respectively. This activity might be used as biocontrol perspective. The isolate was identified by cultural, morphological and biochemical

characterization as *Erwinia* sp. and showed promising results for commercial purposes as an alternative of chemical fertilizers.

SAG-103

IOT Based Monitoring System in Smart Agriculture

Amit Kumar, Ashish Upadhyay and Anuj Chaudhary
School of Agriculture & Environmental Sciences, Shobhit University Gangoh, Saharanpur, U.P.

Internet of Things (IOT) plays a crucial role in smart agriculture. Smart farming is an emerging concept, because IOT sensors capable of providing information about their agriculture fields. The paper aims making use of evolving technology i.e. IOT and smart agriculture using automation. Monitoring environmental factors is the major factor to improve the yield of the efficient crops. The feature of this paper includes monitoring temperature and humidity in agricultural field through sensors using CC3200 single chip. Camera is interfaced with CC3200 to capture images and send that pictures through MMS to farmers mobile using Wi-Fi.

SAG-104

IoE Monitoring System for Agriculture

Aniket Kumar & Rakesh Kumar Jain
Deptt. of Electronics & Communication
E-mail: aniket.kumar@shobhituniversity.ac.in

The Internet of Everything (IoE) connecting everyday things embedded with electronics, software and sensors to the Internet enabling them to collect and exchange data, popularly known as IoT is a buzzword that can be used for Smart Agriculture. In the traditional Irrigation methods that are followed in Indian village to grow Rabi & Kharif crops at different altitudes & longitudes if IoE techniques are used it would increase quality & productivity. Irrigation system which is monitored manually by farmers in terms of crop type & climatic conditions if the same system is IoE enabled and is monitored at different servers, much of the hurdles which farmers are facing now a day will get rid out. Timely monitoring soil moisture, temperature & humidity through sensors (DHT11 & SDS011 Sensor) reading & the type of crop will control switching of pumps automatically. In this way we may utilize resources efficiently & more accurately.

SAG-105

Leaf Spot Disease Caused by Fungal Pathogen Associated with *Citrus limetta* Risso.

Anjali M[1] & Soumya K R[2]
[1]Vikram B.Ed., College, Chintamani, Kanataka
[2]Deptt. of Biotechnology, Government Women's College, Kolar-563101, Karnataka.

Horticulture is the science and art of growing plants (fruits, vegetables, flowers and any other cultivar). It also includes plant conservation, landscape restoration, soil management and garden design. India is the second largest producer of fruits after Brazil. Fruits play an important role in human nutrition by contributing the necessary growth factors such as vitamins and essential minerals in human daily diet maintaining a good and normal health. Rot diseases caused by fungal pathogens provoke severe losses of agricultural and horticultural crops every year. *Citrus limetta* Risso. belongs to the family Rutaceae a very common disease in the plant is leaf spot and fruit rot and it has gained least attention of researchers. Citrus leaf plants with leaf spot disease sample leaves were collected from Madikeri district of Karnataka, India. The pathogen was isolated on Potato Dextrose agar (PDA) from surface sterilized small pieces of the leaves and twigs, incubated at 25°C, and six different fungal pathogens were identified i.e, Fusarium, was the cause for the disease according to its morphological and cultural characteristics and study was done based on colony characters. Disease management studies is under process.

SAG-106

Climate-Smart Agriculture Approaches to Support Food Security

Anuj Chaudhary, Ashish Upadhyay, Vikas Pandey
School of Agriculture & Environmental Sciences, Shobhit University Gangoh, Saharanpur, U. P.

Climate-smart agriculture (CSA) is an approach for transforming and reorienting agricultural systems to support food security under the new realities of climate change. Widespread changes in rainfall and temperature patterns threaten agricultural production and increase the vulnerability of people dependent on agriculture for their livelihoods, which includes most of the world's poor. Climate change disrupts food markets, posing population-wide risks to food supply. Threats can be reduced by increasing the adaptive capacity of farmers as well as increasing resilience and resource use efficiency in agricultural production systems. CSA promotes coordinated actions by farmers, researchers, private sector, civil society and policymakers towards climate-resilient pathways through four main action areas: (1) building evidence; (2) increasing local institutional effectiveness; (3) fostering coherence between climate and agricultural policies; and (4) linking climate and agricultural financing. CSA differs from 'business-as-usual' approaches by emphasizing the capacity to implement flexible, context-specific solutions, supported by innovative policy and financing actions.

SAG-107

Smart Agriculture Vs Smart Villages

Ashish Upadhyay
School of Agriculture & Environmental Sciences, Shobhit University Gangoh, Saharanpur, U. P.

Over recent years, the challenges arising from the social and economic, but also wider changes of people's communities—rural and urban—have been increasingly addressed through the lenses of technological developments and digitalization. In this paper, we have focused on the applications of the Smart Village concept and the importance of digital transformation for rural areas, always drawing parallels between the findings and insights from different regions. We aim to use these new insights in developing the framework of the Smart digital transformation of villages. Furthermore, in order to make the concept of "smart development" more accessible and useful for our case of Smart Villages, we have made an evaluation of the projects and programs based on criteria that define "smartness" in the broader sense within the framework of GoI policies. For deeper understanding of smart development in specific regions, it is important to make an in-depth analysis of different possible approaches. Below, we are presenting a short analysis of the chosen examples according to the GoI pillars/drivers of Smart Villages: (i) Responding to depopulation and demographic change; (ii) Finding local solutions; (iii) Exploring linkages with small towns and cities; (iv) Accelerating the role of rural areas in low-carbon circular economy; and (v) Promoting digital transformation.

By agricultural activities and high rates of unemployment. Smart development solutions were therefore mainly addressing the ways to create opportunities for local employment and alleviate the living conditions. On the other hand, the role of transition to circular economy has been accelerated in the case of Lapland where the main issue to address was to stop the outflow of the money especially in connection to the energy and food self-sufficiency. In the case of Smart Villages, the digital transformation was at the forefront. To invest in digital connectivity within the villages and also within the broader regional community was therefore also to improve opportunities for local/regional and circular economy and to enhance the sustainable development of the area. it is to look for strategies and solutions based on local or regional knowledge, even more so when striving for a sustainable future. Rural areas are not uniform, and the smart development has to be applied in combination with a place-based approach. In our context, the approach has to be in line with cultural and geographical specifics of an area, as well as with more specific local characteristics. In line with this, one of the main outputs of the Smart Villages project will be a digital exchange platform intended for the exchange of practices. Another important output will be embodied in the form of a Smart Villages Toolbox, based on insights from our pilot, local-based activities. As such, it will have a great impact on further development and implementations of the concept into reality-based environments and will contribute to better framework conditions for (digital) innovation in societal and technical parts as smart village vs smart agriculture.

SAG-108

Analysis of Groundwater Quality for Irrigation at Noida in the vicinity of Yamuna River

Basudev Singh and Jyoti Sharma
School of Basic and Applied Sciences, Shobhit Institute of Engineering &Technology, Meerut, U.P.
E-mail: vasu.nauhwar@gmail.com

Agriculture is the basic need of People to survive. Suitability of irrigation water depends upon several factors, such as water quality, soil type, plant characteristics, irrigation method, drainage, climate and the local conditions. Water plays an important role in agriculture. The main source of water used for irrigation is ground water. So, it has become very much important to analyse the quality of ground water with respect to irrigation. Total salt concentration, SAR ratio, Residual sodium carbonate or bicarbonate ion concentration and boron content are the major parameters which affects the quality of irrigation water. Ground water sample in the vicinity of Yamuna at Noida is analysed for the above parameters. Results are compared with Indian standard guidelines for the quality of irrigation water IS: 11624-1986. Parameters like Total salt concentration and SAR ratio does not complies with the standard. Total Salt concentration expressed as electrical conductivity is much higher than the standard limit, which is more than 6000 micromhos/cm. Final conclusion is observed that sample of ground water taken for analysis is not suitable for irrigation purpose for most of the crops.

SAG-109

Socio-Economic Empowerment of Rural Women through training on preparation of Value Added Products for Income Generation & General Well-being

Charu Gupta and Dhan Prakash
Amity Institute for Herbal Research & Studies (AIHRS), Amity University UP, Sec-125, Noida
E-mail: cgupta@amity.edu

In the present study, the rural women of villages of Western Uttar Pradesh district Saharanpur were trained on the agro-technology and processing of medicinal and aromatic plants (mainly lemongrass & basil) to produce value added products. The rural women of about 13 villages (in Saharanpur district, Western UP) participated in the training programs in the preparation of herbal products such as lemongrass tea, basil tea, lemongrass leaves powder, basil powder, floor cleaner, face-toner, mosquito repellent spray and incense-sticks, herbal hand sanitizer, herbal lemongrass bath, herbal face astringent. They were also trained on the extraction of essential oil from lemongrass and basil through onsite demonstration on mini distillation unit. More than 20 training programs have been conducted till date in which around 750 rural women and farmers were imparted training. The aromatic plants were planted on their unused backyard land such as kitchen garden, community land, Gram Panchayat land etc.

without disturbing their conventional crops. The market linkage was also developed through the project where the rural women got returns from the sale of their plantation. This model became a success story and is thus being replicated in other adjoining rural areas of dist. Saharanpur.

SAG-110

Application of Geospatial technology with special reference to Geographic Information System (GIS), Global Positioning System (GPS) and Remote Sensing (RS) in Precision Agriculture

Dimple Kaparwan and Balveer Singh
Deptt. of Agronomy, SardarVallabh Bhai Patel University of Agriculture and Technology (SVPUA&T), Meerut
E-mail: dimplekaparwa@gmail.com

Precision agriculture is a computer aided technology which allows balanced nutrition in soil and crops by providing exact quantities of inputs as required in order to maintain optimum production and soil health. Evaluating spatial and temporal variability of fields through geospatial technology is the key in lowering input use & maximizing outputs with lesser negative effect on environment. Location accuracy provided by GPS is the basis for site specific farming. Wider use of Hyper & Multispectral images taken from Satellites and Drones are used for Accurate planting, weed mapping, Fertilizer mapping, Irrigation management based on moisture stress, Site specific pesticide and herbicide application, Yield estimation etc. Geographic information system (GIS) stores remote sensing, GPS and other forms of spatial and attribute data inside a geodatabase that could be used for soil and water resource management and analysis. GIS software's are widely used in managing agricultural data pertaining to soil physiochemical properties viz., soil ph, texture, bulk density, electrical conductivity, available nutrients etc., -Crop attributes viz., plant density, leaf area, nutrient content, yield attributes, weed, insect, and disease infestation, and Topographical characteristics which could be further spatially analysed for maintaining appropriate seed rate and depth, fertilizer application, irrigation scheduling, micro spraying, selective harvesting etc. which forms the basis for Smart Agriculture Mechanization. Integration of GIS, GPS and remote sensing data accompanied with ground truth surveys have necessarily made it a prescription farming by giving inputs when required by crops. It could therefore be perceived that GIS is one of the most powerful tools for decision making in precision agriculture with geo-information. So, Geospatial technology proves to be very effective for improving soil and crop health resulting in higher yields without impairing environment conditions.

SAG-111

Impact of Hindon water irrigation on accumulation of heavy metals in agricultural fields of district Baghpat, Uttar Pradesh

Dimple Kaparwan, N.S Rana, B.P Dhyani, Vivek
Deptt. of Agronomy, Sardar Vallabh Bhai Patel University of Agriculture and Technology (SVPUA&T), Meerut
E-mail: dimplekaparwa@gmail.com

River Hindon has its origin at lower Shivalik range in district Saharanpur and before its confluence with Yamuna river in Delhi, it flows through Muzaffarnagar, Shamli, Meerut, Baghpat, Ghaziabad and Gautam Budha Nagar in western part of Uttar Pradesh. This river has recorded a very high pollution rate in recent times due to continuous pouring of untreated industrial effluents and domestic waste accompanied with rain showers as the primary source of fresh water for increased dilution potential of the river. Usage of hindon water for drinking and irrigation purpose is a serious issue as the water is loaded with heavy metals which can cause potential threat to human and animal life. Unlike organic contaminants, heavy metals are non-biodegradable and can affect vital organs of our body & could be even carcinogenic at greater levels. In a preliminary study conducted on the heavy metal contamination in soils adjoining Hindon river stretch at Baghpat city, U.P, it was revealed that much higher concentration of heavy metals was present in soils than the prescribed permissible limits given by Food and Agricultural Organization (FAO). Soil samples were collected from four different agricultural fields adjoining Hindon river at a distance of one km. The increase in the level of heavy metals in soil samples was found in the decreasing order as Fe (9330.65 mg/kg) >Mn (239.41 mg/kg) >Zn (28.12 mg/kg) Ni (16.40 mg/ kg) >Pb (4.68 mg/kg) >As (2.34 mg/kg). These heavy metals might have accumulated over a period of time due to continuous use of Hindon water for irrigating crops which opened its pathway for HMs entry in our food chain through plant uptake.

SAG-112

Changes in soil microbial community structure, enzyme activity with physico-chemical property in IC-HAPI along IA-AW zone in Rajasthan

Jyoti Sihag[1], Divya Prakash[2]
[1]Deptt. of Chemistry, Amity School of Applied Sciences, Amity University Rajasthan, Jaipur (India)
[2]School of Biological Engineering & Sciences, Shobhit University Gangoh, Saharanpur (India)
E-mail: divya.prakash@shobhituniversity.ac.in

Soil is dynamic and natural that presented in the uppermost layer of earth's crust. Comparison in soil fertilization status was assessed between IC-HAPI and IA-AW zone of Rajasthan. The comparison was

assessed using sand, silt, clay, electrical conductivity (EC), pH, organic matter (OM), potassium (K), phosphorus (P), nitrogen (N), zinc (Zn), copper (Cu), iron (Fe), manganese (Mn), enzyme activity of acid phosphatase, alkaline phosphatase, dehydrogenase, and urease properties in soil of both zone. For evaluation of comparison in the soil parameters of IC-HAPI and IA-AW zone, the deterioration index (DI) was used. According to calculation, +53.35 % DI value of phosphorus were analyzed for farmland soil of IC-HAPI zone. While in case of calcium carbonate and sand content, negative –76.78 % and –6.89% DI values were observed. According to data, the deficiency of nitrogen and phosphorus were analyzed in wasteland soil of IC-HAPI and IA-AW zone. Aotobacter and Bacillus megaterium bio-fertilizers can be more beneficial to enhance the deficiency of nitrogen and phosphorus nutrient in soil. The suggestions of this study are applicable to nutrient management, fertility management, environment management, and sustainable eco-friendly agricultural field management.

SAG-113

Studies on biochemical parameters of Pomegranate (*Punica granatum* L.) with special Reference to red aril cultivars

Arvind Kumar, Jeetendra Kumar, Satya Prakash, Vipin Kumar and Mukesh Kumar
Sardar Vallabhbhai Patel University of Agriculture &Technology, Meerut-250 110

The present investigation was conducted at Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut to find out the promising cultivars of pomegranate on the basis of biochemical perameters. The maximum level of TSS was measured in cv. Ganesh (14.710brix) followed by cv. Arakta (13.840brix) and cv. G-137 (12.710brix). Of the eight cultivars studied, significantly maximum level of total sugars was found in cv. Arakta (12.98 %) followed by cv. Mridula (12.36 %) and cv. Ganesh (12.33 %). The level of titratable acidity was found to be significantly lowest in cv. Jalore Seedless (0.30 %) followed by cv. Mridula (0.31). In the present study, maximum TSS: Acid ratio was observed in cv. Ganesh (45.96) followed by cv. G-137 (41.00) and cv. Jalore Seedless (40.73). Significantly maximum Sugar: Acid ratio was recorded in cv. Mridula (39.87) closely followed by cvs. Jalore Seedless (39.40), Ganesh (38.53) and Arakta (38.17).

SAG-114

Studies on vegetative and reproductive parameters of pomegranate (*Punica granatum* L.) cultivars

Arvind Kumar, Jeetendra Kumar, Satya Prakash, Vipin Kumar & Mukesh kumar
Sardar Vallabhbhai Patel University of Agriculture &Technology, Meerut-250 110
E-mail: arvindadr88@yahoo.co.in

The present investigation entitled "Studies on vegetative, reproductive and biochemical parameters of pomegranate (*Punica granatum* L.) cultivars", was conducted at Horticutural Research Centre (HRC) of the Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut -250110, during 2015-2016. The findings revealed that among the eight pomegranate cultivars studied, cv. Muskat Red was found to be vigorous, while cv. Phulerakta was observed to be dwarf in respect plant height. Earliest flowering was recorded in cv. Jalore Seedless, while cultivar Mridula flowered very late among the pomegranate cultivars. In the present study, cv. Ganesh bore fruits of bigger size, while minimum fruit size was found in cv. Mridula. Data recorded on fruit yield and quality indicated that cvs. Ganesh and Arakta. Data recorded on fruit yield and quality indicated that cvs. Ganesh and Arakta were found superior over other cultivars.

SAG-115

Performance of CCC and NPK on growth, flowering and yield of chrysanthemum (*Dendranthema grandiflora* Ramat) cv. Birbal Sahni

Joginder Singh[1] and Rashmi Nigam[2]
1Deptt. of Horticulture, 2Deptt. of Plant Pathology, J.V. College, Baraut, U.P.
E-mail: drjsingh1982@gmail.com

The present investigation entitled "Performance of CCC and NPK on growth, flowering and yield of chrysanthemum (*Dendranthema grandiflora* Ramat) cv. Birbal Sahni" was conducted at Horticultural Research Farm, Deptt. of Horticulture, J. V. College, Baraut, Baghpat, U.P. India. Usual method of soil analysis and cultural operation were done. The data obtained from the investigation were analyzed. The treatment combinations consisting, three levels of CCC viz. C1 (1000 ppm), C2 (5000 ppm) and C3 (10000 ppm), three levels of NPK i.e. N1 (100 kg N2 + 60 kg P2O5 + 40 kg K2O /ha), N2 (150 kg N2 + 120 kg P2O5 + 80 kg K2O /ha) and N3 (200 kg N2 + 180 kg P2O5 + 120 kg K2O /ha) and their interactions and one is control. The present result revealed that the 150 ppm concentration of 5000 ppm concentration of CCC was found beneficial for plant height, plant spread, diameter of main stem, number of branches and leaves per plant, number of flowers per plant, flower size, flower stalk length, flower weight per plant, flower yield (q/ha) and shelf life of flowers. The application of inorganic fertilizers @ 200 kg N2 + 180 kg P2O5 + 120 kg K2O /ha was found better for plant height, plant

spread, diameter of main stem, number of branches and leaves per plant, days required for first flowering bud, number of flowers per plant, flower size, flower stalk length, flower weight per plant, flower yield (q/ha) while inorganic fertilizers @ 150 kg N2 + 120 kg P2O5 + 80 kg K2O /ha was found beneficial for maximum shelf life of flowers in chrysanthemum cv. Birbal Sahni. However, the interaction effect of plant growth regulators and inorganic fertilizers was also found beneficial for growth, flowering and yield of chrysanthemum.

SAG-116

Augmenting Farmer's Income Through Smart Farming

Shabana[1], R. A. Siddique[2], Nazim Ali[2], K. P. Singh[3] and Praneeta Singh[4]
[1]Shobhit University, Meerut, 250110
[2]College of Veterinary & Animal Sciences, SVPUAT, Meerut, 250110
[3]Deorania, Uttar Pradesh
[4]Livestock Products Technology, GBPUAT, Pantnagar
E-mail: shabnamhaque2001@gmail.com

In India agriculture is known to be one of the most significant economic activities. The two-third of the Indian population is dependent directly or indirectly on the agriculture sector for their livelihood. Indian agriculture sector accounts for 14 per cent of India's gross domestic product (GDP) and provides employment to 50% of the countries workforce. It is important to point out that what is sought to be doubled is the income of farmers, not output or value added or the GDP of the agriculture sector. For achieving this goal, there is a need to adopt innovative and smart methods of farming and diversification in crop choice, animal husbandry. Innovative technologies as high-tech agriculture, crop diversification, integrated farming systems, natural farming, hydroponics, aeroponics and aquaponics, mushroom cultivation, seed production and nursery production etc. can augment the incomes. The adoption of improved inputs, emphasis on micro-irrigation, environment-friendly automation and mechanization, use of nanotechnology inputs, climate forecast, GPS, drones and other machineries and tools common to agriculture, protected agriculture, indoor multi-storey soil less urban farming, hi-tech greenhouse enhance farmers' income. It addition to farming there is a need to also strengthen the apiculture, sericulture, aquaculture and animal husbandry. One of the major players like dairy industry can readily bring socio-economic transformation. Dairy cooperatives now cover 45% of the dairy business, whereas unorganized sectors account for only 28%. Approximately 1.5 crore people are employed in the dairy business. Efforts should be directed towards the development of female dairy farmers by making them adopt newer technologies in breeding, housing, feeding, rearing and health care of milking animals so as to ensure substantial growth in milk output. Improved compliance to milk food legislation and conforming to international standards will also aid in improving export avenues for dairy products. Digital marketing is the best alternative of sell and buy the produce and remove the intermediaries in marketing. Digital marketing is the place, where farmer know the rate of produce and sell them at profitable rate. eNAM, kisan suvidha etc. are best example of digital mandi in India. Investments should

be increased in warehouses and cold chains to prevent post-harvest losses. Value addition of agricultural products is another alternative of increasing farmer incomes. To alleviate the risk, Government should introduce crop insurance scheme at a lower cost. Therefore, allied activities such as Dairy-Animal Husbandry, Poultry, Bee-keeping, Horticulture, and Fisheries, diversified farming, organic farming, FPOs (farmer's producer organization) and Agro forestry system should be promoted and both Union and State Governments should work in synergy by exploiting the above discussed smart agriculture technologies and innovations in holistic manner for the augmenting of farmer's income.

SAG-117

Need and Utilization of Floral Waste from Religious Places in Western Uttar Pradesh

Gaurav Kumar, Manuj Awasthi, Shiwanand Pandey, Rajat Singh and Sunil Malik
Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, U.P
E-mail: Gaurav777@gmail.com

India has consistently been known for its abundance of excellent verdure, with heaps of petals frequently spilling out of strict spots and across pathways in wedding functions. Botanical waste from the strict spots ought to be reused into natural hues, incense sticks and fertilizer by National Government Organizations(NGOs) working with down and out ladies and slow-witted individuals, as per NGOs' they are reused into natural hues, agarbatti and manure. Generally, blossoms utilized in strict functions are disposed of in close by channels, adding to India's now dirtied conduits. While the push off petals may look lovely as they swell over the water, natural issue from decaying blossoms adds to the development of green growth, noticed the report, which can drain oxygen levels and cause marine life to kick the bucket. Under the 'Zero Waste Project', the Noida Authority has tied up with certain NGOs for reusing several kilograms of utilized blossoms each day in an offer to check their dumping in water bodies. The position's Horticulture Deptt. should day by day ship utilized blossoms from almost about six sanctuaries, including the city's sanctuary, to the NGOs occupied with the work."The ladies in these NGOs ought to be prepared in bloom reusing - changing the blossoms into hues for Holi, agarbatti (incense sticks), manure. A Zero Waste venture and all items are 100 percent eco-accommodating. Items are preparing and we the individuals of India will observer a supernatural occurrence - from contaminating the waterway to lighting up the lives of these ladies who have lost all expectation. Natural hues and agarbatti is being made by reusing sanctuary blossoms that are in any case arranged in the waterway making contamination of inconceivable extents.

SAG-118

Agritech Startups Unleash a New Wave of Innovation in Rural India

Gaurav Kumar, Manuj Awasthi, Shiwanand Pandey, Rajat Singh and Sunil Malik
Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & technology,
Modipuram, Meerut, (U.P) -250110
E-mail: Gaurav777@gmail.com

Cutting edge innovations have profited best in class association's in the data innovation, web based business and advanced administrations space in India for quite a while. Numerous new companies have verified huge financing throughout the years in those zones. Presently, it appears that the agri-tech is ending up being the following large space for new companies. This is obvious from the way that Indian agri-tech new businesses got subsidizing worth $248 million as of June 2019, which is a 300% expansion when contrasted with the earlier year, as indicated by an ongoing National Association of Software and Service Companies (NASSCOM) report. Developing at a pace of 25% year on year, India by and by has in excess of 450 new companies in the agri-tech part. It is accounted for that B2B agri-tech new businesses in the nation are quick developing and creating good income by utilizing cutting edge innovations. This has pulled in direct worldwide and area centered assets. What problems are agri-tech startups solving using advanced tech? There are a lot of new businesses out there in country India, who are making arrangements with the goal that ranch misfortunes can be wiped out. Yearly post-reap misfortunes are evaluated to be around 90,000 crores in India. This is because of the botch of assets, an absence of essential foundation and an awful stock chains. This is the motivation behind why the greater part of generally speaking subsidizing in 2019 went to agri-tech new businesses with arrangements identified with showcase linkage and computerized agribusiness administrations. With open private organizations and government support, a few Indian states have built up agri-tech approaches. Factors, for example, the accessibility of good quality homestead information, better administrative condition for startup financing, and modest web availability are a portion of the essential components prompting a flourishing startup biological system in the agri-tech the most recent couple of years.

SAG-119

Smart agriculture as an initiative to enhance skilling of farmers and community

Gauri Shankar, Ashish Upadhyay, Anuj Chaudhary
School of Agriculture & Environmental Sciences, Shobhit University Gangoh, Saharanpur, U.P.

Over recent decades, people's (rural and urban) communities are facing numerous social and economic changes and challenges. Some of those challenges have been increasingly addressed through the lenses of technological developments and digitalization. In this paper, we have made a review of already existing practices while focusing on the existing implementations of the Smart Village concept and the

importance of digital transformation for rural areas. We give special attention to Government policies that we are using as an already existing framework for understanding our own forthcoming examples. We have shown the parallels between the findings and insights from different regions and made an evaluation of presented practices. Our main argument stems from our own previous experiences and experiences of other research approaches, and is grounded on the argument that rural areas are not uniform, and that smart rural development has to be applied in combination with place-based approach.

SAG-120

Isolation, Identification and Characterization of soil fungi from Markanda River area, Ambala, Haryana

Geetika Gupta, Rimpi and Raj Singh
Departt. of Biotechnology, Maharishi Markandeshwar (Deemed to be University), Mullana-Ambala, Haryana

Fungi are abundant in soil next to bacteria. Fungi are important in soil because these are used as food sources for other larger organisms, pathogens. Fungi well grow in dry, arid soil and higher the moisture content in the soil, less oxygen is present for them. It is estimated that number of fungal species reported 72065, spread across 11 phyla in 7745 genera. However, it is difficult to check the number and range of species present in soil as available techniques for isolation and detection of fungi from soil are limited, although it is clear that comparatively few species have yet been isolated and reported from soil. The present study carried out to explore the soil fungi from the Markanda River, originate from Shivalik Hills Himachal Pradesh and flowing through Sirmaur, Ambala and Shahabad Markanda town in Kurukshetra district. Soil samples collected from Ambala region Haryana. The role of fungi in the soil is an extremely complex one and is fundamental to the soil ecosystem. Fungi play a very significant role in nutrient recovering, it seems to be a promising technique to farmers as this technique was environment friendly and are cost effective. Chemical fertilizers also reduce the colonization of plant roots with symbiotic fungi, thus reducing the beneficial effect of soil fungi.

SAG-121

Production and Export of Spices: A Kerala Experience

Jaidev Chauhan[1], Manuj Awasthi[2], Gaurav Kumar[2], Rajat Singh[2], and Sunil Malik[2]
[1]Hemwati Nandan Bahuguna Garhwal University, Srinagar Garhwal, Uttarakhand-246174
[2]Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (U.P)
E-mail: jaidevchauhan678@gmail.com

The Spices economy of Kerala is a flourishing part of outside trade even from second century AD. The state is having a major example of overcoming adversity of generation and export of flavors particularly dark pepper that a great many people called it as dark gold. In method for flavors economy is a fortune for Kerala which is the foundation of Kerala farming segment. The blast in development division and the development of land business have made. Kerala is a shopper state; however, the zest economy consistently sticks out. Be that as it may, different facilitated commerce understandings, fluctuating costs have presented difficult issues to the flavor economy of the state. As dietary patterns of the individuals around the globe have fueled the requirement for nourishment items which has essentially featured the utilization of normal flavors, the greater part of which originate from flavors. Being the biggest maker and exporter of flavors India has monstrous development potential. Flavors from a significant piece of for all intents and purposes all plans in all societies for their flavor and flavoring as well as for their restorative advantages. Indeed, even Vasco da Gama came to Kerala looking for dark pepper. Such a high requested items ought to be delivered and sent out in a nation like India looking for circumstances. The paper manages the present pattern underway and exchange of flavors and openings ahead.

SAG-122

Common property resources utilization and management in valley and hill regions of Manipur, India

Janee Yumlembam
Deptt. of Agricultural Economics, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut

Management of common property resources (CPRs) has long been an important issue for policy analyst. The importance of study is much to do with the fact that agriculture goes hand in hand with these resources. CPRs such as canal provide irrigation water in many villages in the country. Common property land resources are utilized for agricultural purposes, livestock rearing, etc. This article, based on empirical study in hill and valley regions underlines the nature, degree of CPRs uses, and existing mode of management of the resources in northeast Indian state Manipur. And thereby assessed the

potential measures for proper management of the resource. CPRs considered in the study include pond, forest, agricultural land and lake the uses of which are de-facto and de-jure in nature. These have been the source of food, fodder and fuel to the extent of 80-100 per cent. Management system of CPRs in northeast India depends on certain factors such as the definition of CPRs itself viz., land owned collectively and land owned by the village chief. There were Participatory management- community based and Communal tenure- collective action of management in the villages of hill and valley regions respectively. However, there were accounts of no proper management of forest and lake resource. Here we have recommended Community based Participatory management of the forest resource and for the lake resource, formation of committee for collective action in which state government plays the role of a catalyst in mitigating the limits of effective voluntary collective action.

SAG-123

Dynamics of Marketing and Export Potential of Litchi in Muzaffarpur District of Bihar

Janmejay Kumar, Nikky Kumari
Deptt. of Agricultural Economics, Dr. Ra1endra Prasad Central Agricultural University, Pusa, Bihar
E-mail: janmejaykumarrau@gmail.com

Present study was conducted to determine the current status of marketing and export of litchi. The present study based was on the primary data collected from 120 randomly selected Litchi growers from eight villages i.e. 15 from a village of Mushhari and Muroal blocks in Muzaffarpur district of Bihar state. More over the information related to marketing cost, and margin was collected from pre-harvest contractors, harvest contractors, wholesalers, retailers market intermediaries from Muzaffarpur district, block and distant markets. The feasibility of export of litchi from Muzaffarpur to European markets has taken a new dimension with the fast changing technology in the exporting of fruits since 1993. The study also intended to find out marketing system and marketing channels followed by growers in domestic and overseas as marketing, marketing costs, marketing margin incurred price spread and marketing efficiency resulted in domestic markets. Along with, trend in area, production, productivity, export Four channels of marketing were identified viz, Channel I (Producer –consumer), Channel II (Producer – Retailer – Consumer), Channel III (producer – wholesaler- retailer–consumer) and Channel IV (producer -Commission agent -wholesaler – retailer –consumer). The producer's share in consumer rupee in channel Ist is highest since it is the shortest channel (83.64 percent) whereas the producer's share in consumer rupee in channel I, channel II and Channel III are 72.72 percent 65.45 percent and 54.54 percent respectively. The price spread in channel I is the lowest because it is the shortest channel (Rs.900) where as the price spread in channel 1I, channel III and channel IV are Rs. 1500, 1900, and 2500 respectively. The marketing efficiency for channel I, II, III and IV were 5.11, 2.66, 1.89 and 1.09 respectively. It is observed from this efficiency index that channel I was the most efficient one. This is because of the fact that channel I does not involve intermediary. The growth rate analysis indicated that, the export of litchi from Muzaffarpur and from India increased by 1.64 and 6.34 percent per annum during the period of 2001-02 to 2015-16.

SAG-124

Emerging Priorities of Agricultural Extension in The New Millennium

M.N. Ansari and Vikram Bharti
Deptt. of Extension Education, Deptt. of Agronomy, Tirhut College of Agriculture, Bihar
E-mail: mnansari.tca@gmail.com

Agricultural Extension plays an important and significant role in formulating and disseminating latest technology and in teaching farmers to be competent decision-makers. The primary goal of agricultural extension is to assist farming families in adopting their production and marketing strategies to rapidly changing social, economic and political conditions, so that they can shape their lives according to their personal preferences and those of the community. As we move into the new millennium, it will be increasingly necessary and definitely feasible to take a holistic approach to organize positive change in rural areas. In the present context of liberalization, privatization and globalization of agriculture, time has come now for agricultural extension to cope up with the changing scenario with its new strategy and approach to reach farmers not only with basket of technological options, but also with information of new market opportunities and gain, more profit and sustainability of income. For the purpose, extension is to be redefined, redesigned and equipped with several solutions to the problems of different groups of farmers, with varied dimensions of land holdings, income and farmer's situations. The recent information technology and communication revolutions have totally changed the perspective of human life and society. Therefore, agricultural extension must also change to be relevant in the new scenario for all round development of farming community.

SAG-125

Growth and yield of Garlic (*Allium sativun* L.) as affected by Integrated Nutrient Management

Manoj Kumar Singh, A.B. Priyanshu, Mukesh Kumar, Vipin Kumar and Sunil Malik
Deptt. of Horticulture, SVP University of Agriculture and Technology, Meerut (UP)-250110

Garlic is a most important bulbous vegetable crop and also considered as finest spices. It belongs to family Alliaceae. China is produces75% of garlic in world. Total 274-thousand-hectare area under garlic production with an annual production i.e., 1.27 million tons during 2017. The state like Madhya Pradesh accounting 21.9% share in area and 31.89% in production of country. The pungency in garlic is due to the diallyl disulphide. Its cloves are generally consumed as raw and after cooking in various Indian dishes. It helps to control high blood pressure, cholesterol, coronary heart diseases, constipation, faulty digestion chronic cough etc. In crop production system, plant nutrient plays an important role in growth, yield and quality. These nutrients are nourished by various sources like chemical fertilizers, organic manures and biofertilizers. There are some evidences regarding inorganic fertilizers when they

are supplied indiscriminately resulting poor soil heath and their residues in edible portion. Keeping the facts that to reduced the cost of cultivation and improve soil health, plant nutrient sources are applied in judicious manner by the integration of nutrients sources i.e., chemical fertilizers, organic manures and biofertilizers. An experiment was conducted entitled "Growth and yield of Garlic (Allium sativun L.) as affected by Integrated Nutrient Management" with total ten treatments and replicated thrice. Out of these ten treatments, a dose 75% RDF + 40 kg sulphur + 3 ton Vermicompost + PSB + Azotobactor was found significantly superior in terms of growth parameters like plant height (cm), number of leaves, length and width of longest leaf (cm), width of collar region (cm) etc. Similarly, yield and yield attributing parameters like weight of bulb (g), size of bulb (cm), number of cloves, length and diameter of cloves (cm), weight of cloves etc. as compare to control and other treatments. According to the above superiority in growth and yield attributing parameters, the highest bulb yield i.e., 158.93 qha-1 was recorded with an application of 75% RDF + 40 kg sulphur+3 ton vermicompost + PSB + Azotobactor, while comparable lowest yield of garlic bulb i.e., 81.80 qha-1 was noted under control.

SAG-126

Microgreens: Healthier super food for everyone

Manoj Kumar Singh and Mukesh Kumar
Deptt. of Horticulture, SVP University of Agriculture and Technology, Meerut (UP)-250110

Micro-greens are greens vegetable harvested when cotyledons leave (false leaves) have developed for nutrition, garnishing dishes, add flavouring in meals in homes and restaurants. They also give satisfaction to growers in homestead growing by visual means in greenery forms. Generally, broccoli, kale, peas, radish, amaranthus, coriander, fenugreek, mustard, endive, arugula, beet greens, tatsoi, wheat grass etc. are considered as micro greens. Since their introduction to the Californian restaurants in 1980s, they are gaining popularity day by day. Micro-greens are known for its colour and aromatic flavours with high nutrient values as compared to more mature vegetable greens and add more nutrients in dishes. Microgreens are young vegetable greens that are approximately 2.5-7.5 cm tall according types of greens. Microgreens sprouts in shorter period of time i.e., 2-7 days and they are generally harvested in 7-21 days after germination when first true leaves have emerged. It is said that microgreens are packed with high quality nutrients like potassium, iron, zinc, magnesium and copper in abundantly. They are rich sources of antioxidant and vitamins also. According to USDA National Nutrient Database, vitamins and antioxidant levels in microgreen was found 40 times more than more mature leaves. According to some studies, microgreen are rich source of polyphenol (a class of antioxidant) which reduces the risk of heart diseases, cancer, Alzheimer's. Fenugreek microgreens can helps to uptake of cellular sugar by 25-44%. These microgreens are grown at home by using garden soil without any chemical residues or also used vermiculite, perlite and coco peat etc as soil less culture. Growing media free from any infections like fungus, bacteria and viruses. For filling the growing media, pot containers like small pots, trays, plug trays with 8-10 cm deep are generally used. Seeds are broadcasted over the soil surface in 0.5-1.0 cm deed and covered with fine growing media the sprinkle the water on surface

with fine drops. These containers are generally kept at a room temperature for two days up to seeds germinated then shifted in place where 3-4 hours light is available. Watering should be twice a day. Microgreens are generally harvested in within a week after sowing according to the types of microgreens. Keeping the above facts that the microgreens are now being noted as fine food for human beings.

SAG-127

Response of plant growth regulators and cow urine on Vegetative growth, flowering and corm production in gladiolus

Manoj Nazir
Directorate of Agriculture Talab Tillo Jammu (J&K)
E-mail: manojnazir@rediffmail.com

An experiment on the effect of growth regulators (NAA, GA3 and kinetin) Cow urine and cow urine + growth regulators on flowering and corm production in gladiolus were conducted at research form floriculture, karloopp (Jammu) J&K from oct. 2007 to April 2008. 6 cm diameter corms of gladiolus cultivar Eighth wonder were soaked in solution growth regulators and cow urine for 24 hours before planting. Maximum plant height was noticed in GA3 150 PPM and minimum was reported in cow urine (20%) + kinetin 50 Ppm followed by cow urine 10% and 100%. Treatment of cow urine 10%; 20%+GA3—100PPM; GA3---150 PPM GA3 100 Ppm resulted in early spike emergence whereas spike emergence delayed by NAA 100PPM and 200PPM in comparison to control . More spike length was reported by treating the corms with GA3 150 PPM and cow urine 10%. Corms treated with cow urine with 10% also resulted in max. No. of florets /spike, rachis length as compared to control. No effect of these treatments on no. of daughter corms / plant was reported. Diameter of daughter corm was maximum with cow urine (10%) + Kinetin 50 ppm followed by cow urine (10%). Maximum Number of cormlets /plant was reported by treating the corms with cow urine (100%) compared to other treatments.

SAG-128

Kisan Call Centre Scheme with Potential but Still to Be Harnessed

Manuj Awasthi, Abhishek Chandra, and Sunil Malik
Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut
E-mail: manujawasthi24@gmail.com

The Indian Economy whether before advancement and privatization in 1991 or after it, is as yet dependent on the farming generation, in the event that not as a component of GDP, at that point as

various human potential utilized in it. As we have seen that the regular man endures more if costs of any farming items are increments than any ascent in other utility things of intrigue. The previous ascent of onion costs, tomato costs, sugar costs and as of late onion costs has influenced the lower salary bunch all the more harshly. This occurred, in light of inappropriate correspondence with the ranchers of the nation, who in real is the 'man of activity' of this procedure. Each rancher needs to increment in use. There is no law undeniable certainty of benefit in cultivating. This makes him opposing to each innovation and government activity as for farming and correspondence hole is made between the "two" on whom the duty regarding ascend in agribusiness creation lies. Kisan call focus is such activity by the administration to fill such hole. Yet, the plan is still to convey. Here we are in excursion to think about it and in last will recommend what should be possible to build mindfulness about it.

SAG-129

Medicinal mushrooms as an attractive source of natural compounds for future cancer therapy

Maya Datt Joshi, Rupesh Kumar, Sandeep Kumar, Dinesh Kumar and Amar P. Garg
Deptt. of Biotechnology, Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: mayadatt.joshi@shobhituniversity.ac.in

Cancer is the leading cause of death in India and worldwide. Cancer is the uncontrolled division of cells that becomes malignant at later stages through the process of metastasis. Various plants are well known for their anticancer potential. Mushrooms are very important sources of constituents having potent anticancer potential.

Medicinal mushrooms have been used throughout the history of mankind for treatment of various diseases including cancer. Nowadays they have been intensively studied in order to reveal the chemical nature and mechanisms of action of their biomedical capacity. Targeted treatment of cancer, non-harmful for healthy tissues, has become a desired goal in recent decades and compounds of fungal origin provide a vast reservoir of potential innovational drugs. Here, on example of four mushrooms common for use in Asian and Far Eastern folk medicine we demonstrate the complex and multilevel nature of their anticancer potential, basing upon different groups of compounds that can simultaneously target diverse biological processes relevant for cancer treatment, focusing on targeted approaches specific to malignant tissues. We show that some aspects of fungotherapy of tumors are studied relatively well, while others are still waiting to be fully unraveled. We also pay attention to the cancer types that are especially susceptible to the fungal treatments.

SAG-130

Applications of Microbes in Agriculture

Minakshi Singh Tomar and Dr. Shubha Dwivedi
Deptt. of Biotechnology, IIMT University, Meerut

Modern agriculture is facing many challenges in which ecological and molecular characteristics are being integrated to accomplish higher crop yield with less environment impacts. The productivity of agro-ecosystems largely depends on soil quality, therefore, soil-plant relationship must consider for safeguarding the quality and sustainability of soil resources. Much research over the past century has been reported that wide range of soil-borne microorganisms provide positive support in plant growth and development through direct and plant-mediated mechanisms. Utilization of microbial inoculants in agriculture-biotech. as biofertilizers, plant-strengtheners, photo-stimulators and biopesticides could prove to be a significant tool in sustainable agriculture. They can be distinguished as (i) plant growth promoting Rhizobacteria (PGPR), (ii) micro-symbionts Arbuscular Mycorrhizal fungi, (iii) N2-fixing bacteria. Certain microbes can be utilized for processing of plant photosynthetic carbon inputs to soil and promote carbon storage in soil. By managing plant microbic association such as Arbuscular Mycorrhizal fungi and microbial inoculants there is a scope for developing more phosphorous efficient plants. Potassium solubilizing microbes excrete organic acids which solubilize the unavailable potassium making it available to soil. Mycorrhizal fungi and PGPR can help to deal with biotic and abiotic stresses via plant growth promotions and induced resistance. Accordingly, interactions between these soil microorganisms are significant to agro-ecosystem functioning and the maintenance of soil fertility enhance plant vigour, productivity and soil quality.

SAG-131

"*Paspalum scrobiculatum*" a potential crop for food and nutrient security

Nitesh Singh[1], Pratibha Singh[2], Aadil Mansoori[1], and Anirudh Kumar[1]
[1]Indira Gandhi National Tribal University (IGNTU), Amarkantak-484887, India
[2]Udai Pratap Autonomous College, Varanasi -221002, India.
E-mail: niteshigntu@gmail.com

Cereals are a valuable source of bioactive compounds which has shown to be highly effective in the prevention and treatment of multiple diseases, inspite of this also considered as food of poor people. Paspalum scrobiculatum L. is a type of small seeded grain, commonly known as "Kodo" is a variety of millet consumed primarily in India as richest source of calcium which also has medicinal and pharmaceutical significance. Kodo rice (cooked and fermented kodo rice) is used by tribal people of central India in beverage preparation. Popped form of this cereal is used as snacks. Earlier this plant was used as a green fodder. Another form stover is used as green forage mixed feed. For giving

nutritional status, yield enhancement under both irrigated and drought conditions are necessary. While "Kodo" grains have high levels of nutrients, their bioavailability is quite low in humans. Still it is used by tribal people of central India like Baiga, Gond and other tribal communities on daily basis as a food source. In view of the stable harvests ensured, easy crop production, drought resistance, and eco-friendly production, the farmers who had shifted from millets like "Kodo" to other crops are keen to go back to Kodo millet and other small millets like finger millet, little millet, foxtail millet, barnyard millet, brown top millet and proso millet. The major compounds reported to be be present in kodo millet are (Z,Z)-9,12-octadecadienoic acid (26.80 %), and tetradecanoic acid (6.41 %).

SAG-132

Integrated Farming Systems: An Approach to Increase Food Security and Farm Income

Rahul Kumar
Deptt. of Agronomy, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (UP) India
E-mail: gautamrk.ag@gmail.com

Agriculture production is the backbone of Indian economy, but the contribution agriculture in GDP is declining year by year, average size of land holding is gradually decreasing (<0.5 ha) and number of operational land holdings is increasing with the pace of time. It is essential to develop strategies that enable sufficient income and employment, particularly for small and marginal farmers who represent approximately 87% of the farming community. Under the decreasing land holding, horizontal extension of land is not possible. For this reason, vertical integration of farm enterprises will make farming more cost-effective and reliable. Integrated farming systems proved as viable approach with an appropriate combination of farm enterprises, such as crop production, animal husbandry, forestry, poultry, horticulture, fishery, apiculture and sericulture etc. in precise farming condition to meet the problems of decreasing economic growth of our Indian farming communities. Therefore, it seems to be a great tool for natural and human resource management in growing countries like India. This whole farming system approach is very useful in solving the problems of small and marginal farmers of India. The farming system approach is helpful in increasing the farm income and employment generation for rural population and also protects the natural resources in the course of recycling of the crop residues and animal wastes used at the farm.

SAG-133

Study of agrochemical residues analysis in paddy using tandem mass spectroscopy

Rana Vinay Kumar Verma, Jyoti Sharma
Deptt. of Biotechnology, School of Biological Engineering & Sciences, Shobhit Institute of Engineering & Technology, (Deemed To be University) Meerut
E-mail: rana.vkv@gmail.com

To study agrochemical analysis in paddy, sixty-five samples directly from farmer fields and freshly arrived in the mandi and markets were analysed for the presence of different pesticide residues. Samples were analysed modified QuEChERS extraction, triple quadruple mass spectrometry with HPLC (QQQ-MS), were used to test fast and for reliable confirmation. All the samples collected were dried in shining day light for at least 12hours to remove the excess moisture and or water droplets if brought directly from fields. Dried samples brought to lab were properly homogenized and milled to sub milli-meter particle size. Milled samples were further taken to extraction with 0.5% acetic acid in acetonitrile and were cleaned up with magnesium sulphate and primary secondary amine. Screened samples were detected with more than 40plus pesticides in irregular amounts. Analysed samples were found to be contaminated with 0.002mg/kg to more than 1.5 mg/kg which were many times more to that of maximum residue limits decided especially for rice. Recoveries checked from spiked sample were between 80% to 120% and correlation coefficient R2 of 0.995 or more. It was found suitable to analyse paddy and decide whether to use or not for the required purpose.

SAG-134

Role of Water Saving Techniques in Agriculture

S. K. Goyal, Jai P. Rai and Shree Ram Singh
BHU-KVK. I. Ag. Scs., RGSC, Barkachha, Mirzapur

Water is a gift given by nature that is invaluable not only to life but also to the environment. India is a country of villages, agriculture is the means of livelihood of the villagers and irrigation water is important for agriculture. According to an estimate, by the year 2030, 71% of the global water will be used in agriculture. Water is a major crop production factor, as it is needed in greater quantity throughout the life of plants. Growing crops becomes almost unrelated due to lack of water. The maximum loss of water is caused by adopting traditional crop production methods in agriculture, while many advanced irrigation methods and farming methods are available for water saving at present, which can be adopted with less water and labour yield per unit area. Water scarcity, over-exploitation of ground water resources, inadequate use of surface water, continuous expansion of agricultural land, urbanization and industrialization, unnecessary use of water, proper management of rainwater harvesting, reservoirs and water storage areas shortage, and lack of water treatment plants, prudent and

rational management of stored water, etc. are many problems of water saving. Technically planned use of various methods of water saving will be necessary for rainfed farming. Advanced techniques developed by agricultural scientists will have to be delivered to farmers at the appropriate time. There is an urgent need to ensure public participation by making water saving schemes more effective for the farmers of these areas. By adopting water saving techniques and implementing them effectively as a measure, adopting government efforts to manage water resources, following water harvesting and management systems and adopting the suggestions given by scientists at different levels increase in income of farmers can be achieved.

SAG-135

An Assessment of the Availability of ICT Tools used by Farmers for Crop Practice in Samastipur & Katihar district of Bihar

Shreya Anand, Satya Prakash, A.K Singh & Sudhamini Yedida

In India in recent years have led to widespread capacity for dissemination of knowledge and information to the rural community. However, rural population in our country still have issues in accessing essential information in the forms they shall perceive so as to form timely decisions for better farming. In previous couple of years' innovative ideas came in to existence. Indian farming community is at present facing multitude of problems to maximize crop productivity. The use of information is wide and multifarious. So, the study was conducted to assess the opportunity for using ICT. The present study was carried out in two district of Bihar state i.e. Samastipur and Katihar, in four villages. In total 100 respondents viz., 50 farmers from each district, 50 farmers from each block and 25 farmers from each village were selected for present study. Availability of mobile among the farmers was high followed by television, FM/Radio, internet, Whatsapp. Others like Video conferencing, Facebook, You tube, e-book/e-magazine, kisan help line, Personal computer/laptop, e-mail, Web portals (Internet) and CD/DVD available/access by the farmers.

SAG-136

Agriculture 4.0: Precision Agriculture through AIoT (Artificial Intelligence of Things)

Anmol, Shailesh Kumar Singh
Deptt. of Horticulture, School of Agriculture, Lovely Professional University, Punjab, India
E-mail: shailesh.19105@lpu.co.in

AIoT is the convergence of AI (Artificial Intelligence) and IoT (Internet of Thing) which is going to redefine the phase of automation in agriculture, i.e. Agriculture 4.0 revolution. Both the components, AI and IoT are independent technology which together act as the digital nervous system. AI is the

decision-making system like brain and has overall control over the IoT which functions as peripheral nervous system. The combination of these two develops a self-correcting and self-healing system of high degree of automation called as AIoT (Artificial Intelligence of Things). IoT is the cloud-based data storage facility where information is collected through sensors from different sources while the artificial intelligence ensures real time response to the changes or deviations. The cloud-based computing system provides three key aspects viz. connectivity, storage and compute which are the foundation of IoT. The first generation of cloud based IoT provided five key capabilities: to collect, to store, to process, to analyse and to control. The AI add the response (Act) to the existing IoT system which is based on the data. The AI ensures automatic action in IoT at two different levels: (i) influencing the telemetry data by sensors augmentation, (ii) analysing the inbound telemetry data stream in real time. Thus, it occupies the position at the beginning (receptor site for sensing stimulus) and at the end (effector site for response and act) of IoT system.

SAG-137

Studies on the Pattern of Changes in Fruiting behaviour of ber (*Ziziphus mauritiana* Lamk.) fruits during growth and development

Shiwanand Pandey[1], Rajat Singh[2], Manuj Awasthi[2]

[1]Deptt. of Horticulture, NDUA&T, Kumarganj, Ayodhya, U.P.
[2] Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut

The present investigation entitled "Studies on changes during growth and development of ber (Zizyphus mauritiana Lamk.) fruit cv. (Narendra Ber Selection-1)" was carried out during the year 2016-2017. The studies comprised experiment namely fruiting behavior of ber. Ber flowering started from mid of September and completed at mid of November the peak period of flowering was mid of October with 14.57%. Whereas fruit setting took place between 3rd week of September to 1st week of December but peak setting period was last week of September to mid of October with 18.18%. Ber fruit drop started from 3rd week of September with 9.45% and completed at mid of November the peak period of fruit drop was recorded 14.33% in 3rd week of October. Fruit retention percentage also changes during growth and development of ber fruit, fruit retention started in 3rd week of September with 28.93% the peak period of fruit retention 48.06 in 3rd week of November and fruit retention continue till second week of March. Ber fruit was harvested in five pickings, and peak period of yield was first week of March with 40.36 kg/plant. The knowledge about these changes helps in choosing the optimum time of cultural practices like manuring, irrigation, fruit thinning and harvesting. The physiology plays an important role in quality, quantity and shelf life of ber fruit. The studies on changes fruiting behavior of ber during growth and development are essential requirement to determine the maturity, harvesting time and method.

SAG-138

Waste to Wealth: Utilization of Pea industry waste for developing Biodegradable product

Upasana[1] and Deepa Vinay[2]
[1]College of Agriculture Sciences, Teerthankar Mahaveer University, Moradabad, U.P.
[2]Deptt. of Family Resource Management, College of Home Science, G.B.P.U.A. & T. Pantnagar
E-mail: upasana35954@gmail.com

The agro industries produce large volume of waste, resulting from the production, preparation and consumption of food. Pea processing industry involves preserving peas by freezing and marketing them for seasonal limitation and producing a very high amount of waste as by-product. Waste from this industry is not very utilized as valuable byproduct and considered as end products that have not been recycled or used for other purposes. The present study was aimed to utilize pea peel waste in an efficient way for developing biodegradable product through value addition. Assessment of nutritional analysis revealed that waste pea peels have high nutritive value of crude protein (19.79%), and have good amount of ash (7.87%), fat (2.27%) and fibre (1.83%). The result revealed that the developed biodegradable film has good tensile strength (5.96 MPa), surface thickness (70 µm) and water solubility (2.46%). Therefore, biodegradable film can be the deputy of synthetic plastic with the advantage of employment generation, energy recovery and livelihood security which ultimately leads to sustainable environment and development.

SAG-139

Impact of Frontline demonstrations (FLD) on yield of Sunflower (*Helianthus annus* L.) crop in Bihar

Vikram Bharati[1], U.K. Singh[2], Kaushal Kishor[1], C.S. Chaudhary[3]and Kumar N Lamani[1]
[1]Deptt. of Agronomy, [2]Seed Science & Technology and [3]Plant Pathology
Tirhut College of Agriculture- Dholi
Dr. Rajendra Prasad Central Agricultural University, Bihar, Pusa, 848 125
E-mail: vbharatiagro@gmail.com; kumarnlamani@gmail.com

The 102 Frontline demonstrations under AICRP on Sunflower was carried out in 102 farmer's field to demonstrate the impact of improved technology on yield of sunflower during the Spring, 2017. Each frontline demonstration was laid out on 0.4 ha area, & its adjacent 0.4 ha was considered as control (farmer's practice). The frontline demonstration was comprised of two hybrids namely, KBSH-44 and KBSH-53. The result revealed that variety KBSH-53 gave higher yield than KBSH- 44. The result indicated that productivity of sunflower gained under improved demonstrated technology (17.10 q/ha)

was higher as compared to farmer's practices (13.14 q/ha). The study shows that improved technology gave 30.15% higher grain yield over farmer's practices. From the study it can be concluded that Sunflower varieties and improved technology in FLDs gave promising results in terms of yield gap and technology index.

SAG-140

Quenching the Soil's Thirst

Vineeta Verma and Kosh Mahajan
SVPUA&T, Meerut

The population of the world is exploding, green revolution and its chemical based technology is losing its appeal as the dividends are falling and returns are unsustainable. Soil is losing fertility and the produce its nutrient content. Farmers face losses year after year due to low yield, low productivity, infestation by insects and pests in crops, also the middlemen tend to snatch the benefits from them. It is when organic agriculture needs an introduction to the whole farming system. Since 1990 the market for organic food and other products has grown rapidly, reaching $63 billion worldwide in 2012 (Helga Willer el.) and the International Federation of Organic Agriculture Movements (IFOAM, 2013).) This demand has driven a similar increase in organically managed farmland that grew from 2001 to 2011 at a compounding rate of 8.9% per annum (Paull). Organic agricultural land increased almost fourfold in 15 years, from 11 million hectares in 1999 to 43.7 million hectares in 2014. Between 2013 and 2014, organic agricultural land grew by 500,000 hectares worldwide. Not only the land but the number of organic producers also grew by almost 270,000, or more than 13% in 2013. By 2014, there were a reported 2.3 million organic producers in the world. Organic agriculture constitutes use of fertilizers which are organic in nature i.e. non-synthetic fertilizers for example animal manure, green manure and bone meal. Techniques such as crop rotation, companion planting, biological pest control and mixed cropping are practiced. The system enjoys profits to the farmer as no application of fertilizers or pesticides is done also, organic produce is sold at a higher price than conventional ones thus more profit to the farmer. Generally, at homes we observe fruits and vegetables having less shelf life sometimes rot before consumption, such as a banana, these could be used while making compost and later applied to soil. Used tea leaves, vegetable peels and other biodegradable wastes from the household can contribute a lot to the compost. One could easily make compost and use it in kitchen gardens for deriving nourishment from vegetables grown for free. Compost could be used in place of artificial fertilizers and prevent soil deterioration. Also, it helps in enriching the soil with many nutrients and replenishes its natural state.

SAG-141

Utilization of Industrial Waste and By-Products of Citrus Fruits

Vipul Chaudhary[1], Vivak Kumar[2], Sunil[1], Balwant Singh[3] and Vikrant Kumar[1]
Deptt. of Agricultural Engineering, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut
E-mail: vipulchaudhary.in@gmail.com

Citrus fruits are major processed fruits in the world that results in generation of large quantities of by-products, which are rich sources of soluble sugars, cellulose, hemicellulose, pectin, and essential oils. However, very large amount of residues is end up at agriculture field or dumping pit as waste. Excessive disposal of citrus processing industrial waste into landfill is hazardous to environment as well as human health across the world and scientific valorization of these organic residue is an attractive concept that has gained popularity among researchers. Citrus waste generated from juice processing plant that is, peel, pulp, and seeds can be reused as raw material in other industries. Left over solid residue can be used for extraction of essential oils whereas liquid can be used for production of enzymes. Extraction of hydrophobic material from peel can be used for food grade Kraft paper, biodegradable polymers and packaging material from the peel also held in reduced use of petroleum based polyesters. Utilization of citrus residue reduces the environmental pollution as well as produces alternative fuel in terms of bio-oil, biogas, ethanol, and activated carbons. Increased scope of product development increases the overall returns to manufacturer, employment generation and sustainable socio-economic development and maintains environmental stability. Though most of research yet to commercialized at large level, the outcome of the research is worth-while for the future generation and to contribute toward world's highest priority target of sustainable development.

SAG-142

Impact of Precision Nutrient and Water Management on Crop Water Productivity Under Rice-Wheat Cropping System

M. Sharath Chandra; Rajendra Kumar; Rahul Kumar and Shipra Yadav
Deptt. of Agronomy, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (U.P.)
E-mail: sharathagrico@gmail.com

The Rice-wheat cropping system (RWCS) is India's most widely adopted cropping system practiced on an estimated area of around 11 million hectares. This system is prevalent in Indo-Gangetic plains (IGP) and is predominant in Uttar Pradesh, Punjab, Haryana, Bihar, West Bengal, Madhya Pradesh etc. The precision nutrient management practices *viz.*, leaf colour chart (LCC), SPAD, Green Seeker, site-specific nutrient management (SSNM) and precision water management methods such as aerobic rice, system of rice

intensification (SRI), alternate wetting and drying (AWD), direct seeded rice (DSR) and bed planting etc., are followed in RWCS. Adoption of SSNM approaches are the best options for efficient nitrogen management and have emerged as quick and reliable tools to guide real-time need based fertilizer applications especially in Rice-Wheat CS. The conventional puddled transplanted rice consumed more water compared to water saving methods such as aerobic rice, SRI, AWD, DSR etc., they could save the water up to 50% and minimizes the runoff, leaching losses besides maintaining or enhance the resilience of soil and climate. Similarly, the water application in wheat was remarkably lower with permanent bed planting compared to other conventional practices. Ultimately, precision nutrient and water management techniques have a tremendous potential to increase the productivity and profitability of rice-wheat systems besides sustaining the soil and environment health.

SAG-143

Screening of Autumn rice germplasm of Assam for vegetative stage drought stress

Mayuri. D. Mahalle, P. C. Dey, S. K. Chetia, T. Ahmed, and M. K. Modi
DBT-AAU center, Assam Agriculture University, Jorhat, Assam, India
Regional Agricultural Research Station, Titabar, Assam, India

Rice is the primary crop of Assam grown thrice a year. However, *Ahu* or autumn rice which is grown during Feb/Mar to Jun/July is the least productive due to occasional drought appearing during this season. Therefore, identification of highly productive genotypes having inherent tolerance to drought has become an important breeding objective of the state. The present study is carried out with a panel of 269 ahu rice accessions to identify highly productive genotypes having inherent tolerance to drought and traits contributing to their productivity. The panel was assessed in irrigated control and artificial drought stress conditions created in rainout shelter for yield and yield-related traits. Analysis of variance (ANOVA) revealed highly significant differences for all the traits studied under both scenarios thus indicating the suitability of the panel for mapping and related studies. Correlation coefficient analysis showed a significantly positive correlation of grain yield per plant with productive tiller number, spikelet fertility and relative leaf water content under stress conditions which can help select genotypes for improvement of drought tolerance. Accessions like KoniAhu, Nilazi 3, GaramAhu 2, Bengonagutiya, Kola bengonagutiya, AheniAhu, SD16, AS317, SD36 were the best entries and showed the lowest reduction in grain yield in contrast to irrigated conditions and can be utilized as donors in different breeding programs.

SAG-144

Smart Agriculture Using IoT and Cloud Computing

Pawan Kumar Goel
Associate Professor and Head, Deptt. of Computer Science and Engineering
Shri Ram Group of Colleges, Muzaffarnagar
E-mail: pgoel0115@gmail.com

Agriculture is the major source for the largest population in India to earn money and carry out their livelihood. Cloud computing has emerged as an important paradigm for managing and delivering services efficiently over the Internet. Internet of things is the most advanced concept in the modern internet era. It provides support to probably all the domains on the Globe. Agriculture is one of such domains, which makes use of the IoT for making the agriculture smart. Several applications of IoT are evident in the field of Agriculture for the unimaginable benefits of farmers which in turn for the successful development of the nation. This paper reveals an analyzes of potential applications of IoT and Cloud Computing in the field of Agriculture for the essential improvement of the farmers to better crop cultivation.

SAG-145

Effect of Aqueous solutions of Alprazolam on Seedling growth and Seedling biomass of *Lathyrus sativus* L.

Sasmita Priyadarshini Pradhan and Vishnu Shankar Sinha
PG Deptt. of Botany, Tata College, Chaibasa, West Singhbhum, Jharkhand-833202.
E-mail: Vish20nu@gmail.com; sppradhan1301@gmail.com

The present paper reports the effect of aqueous solutions of Alprazolam on seedling growth (root length & shoot length) and seedling biomass (fresh weight & dry weight) performance of *Lathyrus sativus* L (Fabaceae) as compared to control. Alprazolam ($C_{17}H_{13}CIN_4$) is a triazolobenzodiazepine used in panic disorders and other anxiety states. Seeds of Lathyrus sativus L have been treated with different aqueous concentration (0.0025%, 0.0012%, 0.0006% v/v) of Alprazolam and also with double distilled water for control for four hours at room temperature. Ten plants (10 days old) from each treatment and control were randomly selected to evaluate the seedling growth (root length and shoot length) and seedling biomass (fresh weight and dry weight). All determinants were carried out in triplicates. The root length was varied from 8.12±0.16 to 9.76±0.74 in comparison to control *i.e.*, 7.82±0.86 and shoot length was varied from 7.91±1.10 to 8.71±0.68 in comparison to control *i.e.*, 7.13±0.54, similarly fresh weight was varied from 20.75±1.01 to 27.46±0.88 in comparison to control *i.e.*, 22.46±0.16 and dry weight was varied from 5.33±0.48 to 6.28±0.56 in comparison to control *i.e.*, 5.46±0.23. The coefficient of variation

(CV) of fresh weight is more than that of Dry weight, so fresh weight gives more effectiveness than dry weight; similarly, coefficient of variation CV of Shoot length is lesser than that of Root length, so root length gives more effectiveness than shoot length. Further Correlation Coefficient (r) between the fresh weight and dry weight is 0.98 and root length and shoot length is 0.93 very near to one, showed perfect positive correlation between the variables. Interestingly the seedling growth and seedling biomass were optimum at 0.0012% concentration.

SAG-146

Carbon isotope discrimination as a feasible selection tool for greater water use efficiency (WUE) in wheat

Shailesh Kumar[1] and Bhupider Singh[2]
[1] Deptt. of Botany, Plant Physiology & Biochemistry, CBS&H, RPCAU, Pusa Bihar
[2] CESCRA, IARI, New Delhi
E-mail: shailesh_agri@yahoo.com

Water use efficiency (WUE) is considered as a potential physiological trait that can be exploited in crop improvement programs. However, progress in this direction is hindered due to two reasons, firstly, a reduction is total biomass which often accompanies selection for high WUE and secondly, the non-availability of a reliable screening method. Carbon isotope discrimination which is caused by the tendency of plants to discriminate between heavy (^{13}C) and lighter (^{12}C) isotopes of carbon, has been associated with differences is WUE of genotypes. However, despite numerous reports, the relationship between ^{13}C and water use efficiency, as such under varied environments, is unclear. In the present study experiments were conducted with two bread (C-306 and HD-2329) and one durum (PDW-233) wheat genotypes is nutrient solution culture (0% PEG) and under varying levels of water stress induced using different concentrations of PEG-6000 (0, 10, 20 and 30%). Results reveal a positive correlation between CID and WUE. Bread wheat types showed higher discrimination under normal conditions than the durum wheat type. While under water stress the discrimination decreased for water stress tolerant types. The low CID value were recorded for C-306 whose tolerance to water stress is known. Durum genotype, PDW-233 showed low ^{13}C discrimination and produced more mass under normal and stressful conditions. Across genotypes and treatments, CID in this study was positively influenced by stomatal conductance (r = 0.511) but was negatively related to Rubisco specific activity (r = –0.326) while a positive correlation between CID and WUE (r = 0.598) was evident. Higher dependence of WUE on photosynthesis rather than transpiration, in the present study indicates that an improvement in WUE is possible without compromising on mass or yields. It is advocated to select genotypes with low CID, these are likely to perform better under water stress. We show that carbon isotope discrimination technique has the potential as a tool in selection for improved WUE in wheat breeding programs.

SAG-147

A Study on Determine the Technological Gap in Different Practices of Chickpea Growers in Sohawal Block of Satna District (M.P.)

Shailu Yadav and A.K. Gupta
Deptt. of Technology Transfer Faculty of Agriculture
M.G.C.G.V.V. Chitrakoot, Satna (M.P.)

The present investigation was undertaken to identify the gap between recommended practices of chickpea production technology and technology actually adopted by an individual. The experiment was conducted in a limited time with the restricted size of sample in sohawal block of satna district.There were 120 respondents (15 respondents from each of 8 villages) as sample size of the study and data were collected with the help of pretested interview schedule.Therefore, eight chickpea production technology, namely, field preparation and management, seed and sowing management, fertilizer management, irrigation management, weed management, plant protection management, harvesting management and storage management of chickpea were considered for determining the technological gap.It was measured on basis of technological gap index scores, the respondents were placed in three categories Low, Mediumand High technological gap out of total chickpea growers, 57.50 per cent had medium technological gap, followed by 29.17 per cent had low technological gap and 13.33 per cent had High technological gap in cultivation of chickpea. Thus, it can be concluded that the majority (57.50%) of respondents were having medium technological gap, this medium technological gap may be due to poor economic conditions, knowledge, adoption of agricultural practices, non-availability of technical information and various constraints in adoption of the practices.

SAG-148

Study of the Effect of Aqueous solutions of Thyroxine Sodium on Seedling growth & Seedling Biomass of *Lathyrus sativus* L.

Subhadra Mahato and Vishnu Shankar Sinha
PG Deptt. of Botany, Tata College, Chaibasa, West Singhbhum, Jharkhand-833202
E-mail: Vish20nu@gmail.com ; subhadra.mahato5@gmail.com

The present paper reports the effect of aqueous solutions of Thyroxine Sodium on seedling growth (root length & shoot length) and seedling biomass (fresh weight & dry weight) performance of *Lathyrus sativus* L (Fabaceae) as compared to control. Thyroxine Sodium (Levothyroxine Sodium) molecular formula ($C_{15}H_{10}I_4NNaO_4.H_2O$), molecular weight (799.86g/mol) is a synthetic levoisomer of Thyroxine (T4). Seeds of Lathyrus sativus L were obtained from Birsa Agriculture University (BAU), Ranchi, India. Seeds of Lathyrus sativus L have been treated with different aqueous concentration (0.05%,

0.25%, 0.12% v/v) of Sodium Thyroxin for four hours at room temperature and for control seeds were kept in double distilled water in identical condition. Ten plants (10 days old) from each treatment and control were randomly selected for evaluation of root length, shoot length, fresh weight and dry weight and all determinants were carried out in triplicates. Root length was varied from 4.93±0.28 to 5.90±0.72 in comparison to control *i.e.,* 5.20±0.33 and shoot length was varied from 16.00±0.12 to 17.75±0.23 in comparison to control *i.e.,* 16.98±0.26, similarly Fresh weight was varied from 25.94±1.12 to 26.90±0.66 in comparison to control *i.e.,* 26.20±0.42 and dry weight was varied from 5.09±0.33 to 5.32±0.72 in comparison to control *i.e.,* 5.13±0.03. The coefficient of variation (CV) of fresh weight is lesser than that of dry weight, so dry weight gives more effectiveness than fresh weight, similarly root length has higher CV than shoot length, hence root length give more effectiveness than shoot length; The correlation coefficient (r) of fresh weight and dry weight was 1.1 and for root length and shoot length was 0.98 and it is much nearer to one (1), so it implies perfect positive correlation between the variables. It was interesting to note that the % of seedling growth (root & shoot length) and seedling biomass (fresh weight and dry weight) were optimum at 0.25% concentrations.

SAG-149

Stimulus of Panchgavya Bio-Manure (PGBM) on developmental growth as well as harvest of *Pisum Sativum*

Tanu Shiri[1], S. S. Gaurav[1], S.K. Singh[3], Sourabh Jain[4], Arvind Kumar[1]and Neha Bisht[2]
[1] Deptt. of Genetics and Plant Breeding, CCSU campus Meerut, Uttar Pradesh
[2] Deptt. of Microbiology, CCSU campus Meerut, Uttar Pradesh
[3] Deptt. of Genetics and Plant Breeding, CCR (PG) College, Muzaffarnagar, UP
[4] Deptt. of Biosciences, Shri Ram College, Muzaffarnagar, UP
E-mail: tanushri240@gmail.com

A field experiment was conducted during six months (2019) to study the effect of bio-fertilizers in conjunction with inorganic fertilizers on growth and yield of pea at Shri Ram College Muzaffarnagar, U.P. The experiment was laid out in split plot design with three replications in sandy loam soil. The experiment comprised 9 treatment combinations of four levels of fertility (Control, PGBM and Urea). Results indicated that the comparative effect of Panchgavya bio- manure (PGBM) on the growth and yield of pea (*Pisum sativum)* was showed that the plant enrichment with respect to biomass components such as mean number of leaf size, leaf length, arial part, root length, root hair, root width, no. of leaf, full plant size and fresh weight of plant were expressively influenced by used PGBM. Similar trend was noticed with respect to leaf length, Fresh weight and plant height which were found to be significantly higher 45 cm, 136.26gm/plant and 60cm/plant respectively. Bio-organic formulation PBGM has increasing level of growth than other treatments. So, it can be concluded that PBGM can be best substitute for chemical fertilizer, which has proven positive effects on various crops with environmental sustainability.

SAG-150

Recent Advancement in Waste- Management in Relation to Soil Health

Vikram Bharati, Kumar.N. Lamani, Kaushal Kishor & Meena, Harkesh
Deptt. of Agronomy, Tirhut College of Agriculture- Dholi
Dr. Rajendra Prasad Central Agricultural University, Bihar, Pusa, 848 125
E-mail: vbharatiagro@gmail.com; kumarnlamani@gmail.com

Soil health is crucial for higher agricultural output, productivity and profitability. Environmental pollution affects both soil and agriculture which are two valuable resources essential to our livelihoods. Today, in many parts of India, the soil has become virtually lifeless with increasing development and industrialization. Acid soils occupy 48-49mha of land which represents more than 15 per cent of the total geographic area. Around 1/2th of such land is under agriculture, and forestry and other uses are under rest. Soil micro-fauna and flora have a crucial role to play in shaping soil biodiversity, farming and climate. Soil and its living organisms form an integral part of the ecosystem and climate and play a critical role in sustaining the functioning and sustainability of soil health ecosystems. Practicing sustainable farming practices will improve soil health.

SAG-151

Study on autumn winter season sugarcane with intercrop of red cabbage var. Primero on growth and yield of both crops.

Anant Kumar, P.K. Madke and Arvind Kumar
Krishi Vigyan Kendra, Ghaziabad
E-mail: intmsc.abhi@gmail.com

A field experiment was conducted during 2017-18 and 2018-2019 autumn winter season sugarcane to evaluate with intercrop of red cabbage var. Primero on growth and yield of both crops. The experiment was conducted in three progressive farmers' field of Ghaziabad district with three treatments i.e. T1- Method of trench planting of sugarcane with intercrop of red cabbage in double rows, T2 -Trench method of sugarcane planting with intercrop of red cabbage in double row of both crops and T3- Control farmers practice. The maximum average yield of sugarcane 1025 q/ha and maximum average yield of cabbage 179 q/ha was recorded in T2 trench planting followed by double row of both crops. The farmers practice was maximum sugarcane average yield 812q/ha and cabbage maximum average yield 145 q/ha in farmers practice was recorded as minimum. The best method of sugarcane transplanting used trench method as compared to single row and flat planting method in each crops. The yield was recorded 26.23% sugarcane and 23.96 % red cabbage more as compared to farmers practice.

SAG-152

Wastewater Fertigation as a Sustainable Technology for Smart Agriculture

Anil Kumar Shankhwar[1], R.K. Srivastava[2] and Sachin Kumar Singh[3]
[1]Research Associate in Indo-EU India-H_2O project, Deptt. of Environmental Science, [2] Professor, Deptt. of Environmental Science & [3]Ph.D Research Scholar, Deptt. of Soil and Water Conservation Engineering, CoT
G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand-263145, India
E-mail: oxeegen@gmail.com

The waste-water-fertigation (WWF) model is gaining substantial grip at intercontinental and nationwide for providing the significant role in redressing the farming planning especially under water stress region. The shortage of irrigation water in agriculture poses a formidable and everlasting threat to worldwide food security. WWF is the conceptions that integrate the reuse of waste water from domestic and industrial sector as an opportunity to mitigate the shortage of irrigation water and giving the momentum to agricultural growth strategies to support food & livelihood security. The ever increasing human populations in most of the developing nations have pushed the requirement for more food and other agricultural commodity to unprecedented levels. The 'per drop more crop' concept is need to revitalize with new concept "more reuse of recycled and reclaimed water for more crop" for the sustainable agricultural production.

SAG-153

Evaluation of Allelopathic effects of *Lantana camara L.* On Germination and seedling growth of Soybean (*Glycine max L.)*

Babita Patni
HAPPRC HNB Garhwal University Srinagar, Uttarakhand
E-mail: babita28paatni@gmail.com

Allelopathy has been considered not only as an environmentally friendly approach for weed control but also a potential reason causing autotoxicity in crop production. An investigation was conducted to assess the allelopathic potential of weed, *Lantana camara* L. family verbenaceae, on seed germination and seedling growth of the crop *Glycine max* (soybean) The allelopathic potential of aqueous and ethanolic extracts of two parts leaf and root of *Lantana camara* was evaluated. For this, aqueous and ethanolic extracts of 2.5%, 5%, 7.5%, and 10% were prepared from Fresh Leaves (FL), Dry Leaves (DL), Fresh roots (FR), Dry roots (DR). The experiment was conducted in sterilized petridishes at temperature 25°c. The effect of different concentration was compared to distilled water (control). Six germination indies *viz*, Percent germination (%G), Speed of germination (SG), Mean Germination Time

(MGT), Mean Daily Germination (MDG), Germination Index (GI), and Seedling Vigour Index (SVI) were worked out It was found that both leaf and root extracts of *Lantana camara* caused a general phytotoxic effect on seed germination and seedling growth of *Glycine max*. The inhibitory effect was pronounced at higher concentrations, whereas a little stimulatory effect was seen at lower concentrations in some cases. The inhibitory effect was more pronounced in root and lateral root development of the seedling than the seed germination and shoot development of the receptor crop. Thus, the overall result indicated that the allelopathic activity of *Lantana camara* depended on whether the extract was derived from the leaf or root parts of plant. The maximum allelopathic effect occurred with leaf extracts. The result demonstrates that the aqueous and ethanolic extracts of *Lantana camara* have allelopathic potential and should be evaluated as a allelopathic species, presenting a risk or advantage to seed germination and seedling growth of crop.

SAG-154

Adoption and increasing Marigold production potential through Front Line Demonstrations (FLD) in Meerut district of Western Uttar Pradesh conditions

Virendra Pal, Naveen Chandra and Omveer Singh
Krishi Vigyan Kendra, Hastinapur, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut- 250110 (Uttar Pradesh)
E-mail: dvpgangwar77@gmail.com

Marigold is one of the important commercial crop among the floriculture supplementing the regular income to small and marginal farmers of the Meerut district of Uttar Pradesh state. Meerut being a city nearby Delhi NCR region is consumption of flowers is more, but as compared to consumption quality production is very low. However, the major constraints of marigold cultivation are less quality productivity due to the lack of good quality seed, planting materials, non-adoption of recommended package of practices and lack of awareness regarding the economics of the crop as compared to sugarcane. To solve this problem, by front line demonstration were conducted at the farming situations of Meerut district with the participation of farmers after the baseline survey. Marigold production practice in this context front line demonstration (use of improved variety, proper nursery techniques, balance dose of fertilizers, important inter culture operations practice and plant protection measures) increased the yield by 42.67 percent on an average over the farmer practice. The highest extension gap was 68.25q/ha whiles the technology index, which is inversely correlated to the feasibility of the improved technology in the farmer's field, was 22.6 percent. The adoption of improved technology under frontline demonstration (FLDs) resulted in highest gross returns (Rs. 68500/ha), net return (Rs. 59700/ha) and benefit: cost ratio (1.42) as compared to farmer practice.

SAG-155

Nutrient management in wheat for improving fertilizer use efficiency, productivity and soil health

[1]Lali Jat ,[1]N.S. Rana, [1]R. K. Naresh [2] Raju dhayal,[1]Chaithanya and Bal veer Singh
[1] Deptt. of agronomy, [1]SardarVallabhbhai Patel University of Agriculture & Technology, Meerut-250110, U.P., India
[2] Deptt. of nematology, RARI, Duragapura, Jobner,
E-mail: Lalidhayal1990@gmail.com

Wheat (*Triticum aestivum* L) is the second most important staple food and meets about 61% of the protein requirement of the India. The introduction of new high yielding varieties coupled with chemical fertilizer use and creation of irrigation infrastructure have led to green revolution during mid 1960's due to which India became second largest producer next to China, contributing about 35% in cereal basket of country. This can be done through all available nutrient sources, inorganic and organic, but the bottom line is that any mismatch between nutrient input and output that depletes the soil or creates imbalance will adversely affect production potential. Leaf color charts and chlorophyll meters assist in the prediction of crop N needs for rice and wheat, leading to greater N-fertilizer efficiency at various yield levels as reported by Shukla *et al*. (2004). Remote sensing tools are also used to predict crop N demands precisely. At the same time, traditional techniques like balanced fertilization, integrated N management (INM), among others, are also used to supplement recent N management techniques to attain higher productivity and NUE, and reduce environmental pollution through the leakage of N fertilizer. Site and crop specific fertilizer management, customized fertilizers, fortified fertilizers and Urea Briquette in UDP technology, fertigation, foliar spray, eco–fertilization and etc. farmyard manure improve the chemical and biological condition of soil by increasing cation exchange capacity and beneficial soil micro-organism which are involved in various biochemical processes and release of nutrients Sharma *et al*. (2015). Thus, it can be concluded that wheat productivity, NUE and soil health can be improving with the use of SSNM and nutrient budgeting etc. Use of organic manures, biofertilizers in combination with fertilizers can increase the growth and yield of wheat crop. The maximum grain yield of wheat can be obtained with application of NPK Zn based on soil test + FYM @ 5 t/ha + Biofertilizer. Besides, soil fertility can also be improved with the use of balanced fertilization or use of organic sources of nutrients in wheat.

SAG-156

The study of sugarcane with intercrop of marigold var. Pusa Narangi on growth and yield of both crops during autumn winter season

Anant Kumar, P. K. Madke and Arvind Kumar
Krishi Vigyan Kendra, Ghaziabad
E-mail: dr.anantkumar1@gmail.com

On farm field trial experiment was conducted during 2017-18 and 2018-2019 autumn winter season sugarcane to evaluate with intercrop of marigold var. Pusa Narangi on growth and yield of both crops. The experiment was conducted in three progressive farmers' field of Ghaziabad district with three treatments i.e. T1- Method of trench planting of sugarcane with intercrop of marigold var. Pusa Narangi in single row, T2 -Trench method of double row sugarcane planting with intercrop of marigold var. Pusa Narangi and T3- Control farmers practice. The maximum average yield of sugarcane 1012 q/ha and maximum average yield of marigold var. Pusa Narangi 175 q/ha was recorded in T2 trench planting followed by double row of sugarcane crops. The farmers practice was maximum sugarcane average yield 810 q/ha and marigold maximum average yield 147 q/ha in farmers practice was recorded as minimum. The best method of sugarcane double rows planting used trench method as compared to single row and flat planting method in each crops. The yield was recorded 24.93% sugarcane and 19.04 % marigold var. Pusa Narangi more as compared to farmers practice.

SAG-157

Biohardening of *In vitro* raised plants of *Gerbera*

Pragati Misra[1], Priyanka Dubey[1], P.W. Ramteke[2] and Pradeep K. Shukla[2]
[1] Deptt. of Molecular and Cellular Engineering, Jacob School of Biotechnology and Bioengineering, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad [2] Deptt. of Biological Sciences, Faculty of Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad 211007, UP, INDIA
E-mail: pragatimisra3@rediffmail.com

Micro propagation the propagation of plants by growing plantlets in tissue culture and then planting them to the field. During acclimatization i.e., IV stage, high rate mortality of plantlets, raised through *in vitro* culture occurred. Major portion of the production cost in plant tissue culture is contributed by hardening which is time-consuming and labour demanding process. Biohardening is an evolving aspect of micropropagation technique. Plant Growth Promoting Rhizobacteria (PGPR) are beneficial bacteria that colonize plant roots and enhance plant growth by wide variety of mechanism like phosphate

solubilization, phytohormone production, antifungal activity, etc. In the present work an attempt has been made to establish a protocol for efficient bio hardening of *in vitro* raised plants of *Gerbera.* The five PGPR cultures coded as PR24, PR25, PR26, PR28 and PR29 were taken from the Deptt. of Biological Sciences, SHUATS, Prayagraj. The bacterial inoculants were prepared according to the method of Vincent (1970). *In vitro* raised well rooted plants available in the tissue culture labs were used for hardening experiments. The meristem and corm were used as explants and inoculated on MS medium with different concentrations and combinations of BAP, Kin, NAA, 2,4-D and IBA for the establishment of well rooted plants. Plantlets were first transferred to liquid MS medium for a week. Plantlets were taken out from MS medium, washed and then transferred to the plastic pots filled with sterile soil, sand, coco peat and 200 mg indophill (fungicide) after treatment with different formulations of PGPR's for various durations. *In vitro* raised plants treated with different formulations of PGPR's showed increased growth of the root length; shoot length, internode diameter and number of leaves. The effect of PGPR on survival rate of plant was observed. The PGPR treated plants showed higher survival percentage (78%) than control (60%). So it can be utilized to solve the problem of mortality in the hardening procedure of *in vitro* raised plants. The present protocol highlights the importance of bio-hardening on micropropagated plants.

SAG-158

Isolation of Microfungi from Rice Straw for Enzymatic Degradation

Rinni Sahrawat, Amar P. Garg and Jagpal singh
School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology (Deemed-to-be-University), Modipuram, Meerut-250110, India
E-mail: decent.rinni88@gmail.com

The burning of rice straw by farmers in the field is one of the major concern of the environmentalists in western U.P., Punjab and Haryana. After the harvest of rice crop, the farmer needs vacant field for next crop, hence he finds the easiest way of its dispersal by burning in the field. To overcome this problem, the present study envisages to isolate microfungi and bacteria having high enzymatic potential to degrade rice straw in the field. Small pieces (size 1-2 cm long) of rice straw were buried into the soil in nylon bags (mesh size 0.5 mm) and the fungi and bacteria were isolated using Petri dish moist chamber and dilution plate techniques. In the first stage of decomposition, *Penicllium, Aspergillus, Curvularia, Fusarium, Trichoderma, Alternaria* and *Cladosporium* have been isolated as dominant species of fungi. *Pseudomonas* has also been isolated from decaying samples of rice straw. Further experiments on production of enzymes under solid state fermentation (SSF) conditions are going on. It is proposed that using these enzymes, rice straw will be decomposed in/on soil in a fast mode.

SAG-159

Effect of Climate Change on Agriculture and Bio-resource

Sheetal Chanyal[1], Anil Kumar Shankhwar[2], R. K. Srivastava[3]
[1]Junior Research Fellow, [2]Research Associate and [3]Professor
[1,2,3] Deptt. Environmental Sciences, CBSH, G. B. Pant University of Agriculture & Technology, Pantnagar Uttarakhand, 263145, INDIA
E-mail: chanyalsheetal@gmail.com

Numerous rustic individuals over the Himalayan area of Uttarakhand still follow customary ways of life and are profoundly subject to regular assets for their livelihood. Hence, these individuals are legitimately influenced by the effects of environmental change influencing the regular assets of that specific territory. Right now villages of Gairsain block of the District Chamoli were considered in regards to changes in normal bio-resource, cultivating framework and way of life of individuals because of changing the atmosphere from a most recent couple of years. All developed including edible plant species were recorded through scheduled interviews with the help of respondent by questionnaires filling. It was seen that higher temperature, in the end, diminished yields of alluring harvests which is probably going to be brought about by impacts, for example, shorting of the yield developing period and decline in water accessibility and poor vernalisation of mild grain crops. Changes in perception pattern increase the likelihood of short run crop failures and long run production declines. Higher temperature and high relative humidity increase disease transmission by faster growth rates of pathogens in the environment. Therefore, it is concluded from the study that there is a need for assessments related to the use of adaptation and mitigation measures tailored to the location and livestock production system in use, and policies that support and facilitate the implementation of climate change adaptation and mitigation measures.

SAG-160

Nutritional Value of Mushrooms and its Value Addition as Mushroom Powder

Tarun Kumar[1], Samsher[2], Suresh Chandra[3] and Gopal Singh[4]
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (UP) 250210 India
E-mail: tarun.apfe@gmail.com

Mushrooms also called white vegetables or boneless vegetarian meat that can provide balance diet in sufficient quantities for human nutrition and contain various potent pharma-nutritional compounds. Use of mushrooms may contribute significantly to overcome protein deficiency in the developing countries where good quality proteins from animal sources are either unavailable or unacceptable due to religious beliefs. Mushrooms are one of the few natural sources of vitamin D, which is essential for healthy bones

and teeth. It is a good source of the B vitamins, riboflavin (B2), niacin (B3) and pantothenic acid (B5). The folic acid present in oyster mushrooms helps to cure anemia. It is suitable for people with hyper-tension, obesity and diabetes due to its low sodium: potassium ratio, starch, fat and calorific value. But fresh mushrooms cannot be stored for more than two to three days due to its perishable nature. This is a limiting factor for mushroom marketing. Effective value addition (like making powder) will not only prevent the post harvest losses but also result in greater remuneration to the growers as well as to the processors of mushrooms. In order to develop mushroom powder, raw mushrooms are washed thoroughly and dried until they are as crisp as crackers, then put in a blender until they are reduced to a virtual powder. Then mushroom powder is packed in air tight jar. The mushroom powder can be used in to various food products like cake, bread, biscuit, soups and many more. Addition of mushroom powder into any food product is done to a pre determined level, since excess addition can cause off flavor.

SAG-161

Impact of Information and Communication Technologies (ICT) Over Agriculture in Digital Era

Yogesh Awasthi
College of Engineering and Computer Science
Deptt. of Information Technology
Lebanese French University, Erbil, Kurdistan
E-mail: dryogeshawasthi@lfu.edu.krd

कृषिर्धन्या कृषिर्मेध्या जन्तूनां जीवनं कृषि: | Agriculture provides wealth and intelligence and agriculture is the basis of human life. In this digital era nothing has been untouched by the smart technology. Smart Farming constitutes the application of modern Information and Communication Technologies (ICT) into agriculture, contributing to what can be called a Third Green Revolution. Smart Farming has a genuine potential to deliver a more productive and sustainable agricultural production, based on a more precise and resource-efficient approach. Agriculture can act as accelerator for economic steady growth in developing countries, yet yields in these countries have lagged far behind those in developed countries for decades. One potential instrument for expanding yields is the utilization of improved horticultural innovations, for example, manures, seeds and editing methods. The agile spread of cell phone inclusion in developing nations gives an interesting chance to encourage innovative response through data and correspondence innovation in (ICT)- based expansion programs. This paper plots the potential instruments through which ICT could encourage agrarian appropriation and the arrangement of expansion benefits in developing countries. The reviews of running programs using ICT for agriculture, classified by the usages (voice, text, internet and mobile money transfers) and the availability of services provided. Finally, we identify potential restraints to such programs in terms of design and implementation, and conclude with some recommendations for implementing field-based research on the impact of these programs on farmers' knowledge, technological adoption and welfare.

SHM-101

An Introduction to Sea buckthorn: A Miraculous and Complete Treasure to refresh our overall health

Abha Verma[1], Neelesh Kapoor[2], Maya Datt Joshi[3], Dinesh Kumar[3], Rupesh Kumar[3] and Rekha Dixit[2]

[1]Guru Arjan Dev Nagar, Near Samrala Chowk, Ludhiana

[2]Deptt. of Fingerprinting, College of Biotechnology, Sardar Vallabbhai Patel University of Agriculture and Technology, Meerut

[3]Deptt. of Biotechnology, Shobhit Institute of Engineering & Technology, Meerut

E-mail: abha_1501@rediffmail.com

Sea Buckthorn is a super miracle fruit that has more than 190 bioactive components that may show their impact to every part of a human body from head to toe. It is known as nature's most balanced fruit. This "Holy Fruit of the Himalayas" has been utilized by native Tibetans for centuries because of its incredible nutritive properties. The present study reveals various benefits of Sea Buckthorn in enhancing the overall health and the life span of human being. The study also covers the additional benefits of using Sea Buckthorn juice marketed by Happy Health India in comparison to the related products available in market. The present study also highlights the benefits of Sea Buckthorn as a powerful antioxidant improving cardiovascular health, treating cerebrovascular diseases, increasing immunity, in diabetes care, in treating respiratory disorders, in preventing cancer, in preventing liver damage, for skin care, eye care, oral care and hair care, anti-inflammatory, stamina building, preventing blood clotting and women health care. Happy Health India is a company having a strong base for trading distribution, marketing and promotion of products through multilevel marketing in India as per the guidance and provision of law. HHI is technically collaborated with Wellness Ingredients for the production and marketing of Sea Buckthorn based ayurvedic neutraceutical.

SHM-102

Therapeutic role of *Trigonella foenum* in Human for the Diabetes protection

Tanu Shiri[1], Akash Kumar[2], Govind Singh[2,] Sourabh Jain[3]and Rashmi

[1]Deptt. of Genetics and Plant Breeding, CCS University, Meerut, UP

[2]Deptt. of Bioscience, Vinayak Vidyapeeth, Modipuram, Meerut, UP

[3]Faculty of Biosciences, Shri Ram College, Muzaffarnagar, UP

E-mail: *akashkumar8191asr@gmail.com*

Diabetes disease was first discovered by boring endosperm. The imbalance between radical genetics and booking system for radioactive is the magnitude of oxidative stress. It is known for the seeds and leaves and medicines for diabetics. *Trigonella foenum* is used for diabetics who are currently growing

extremely fast. Diabetes disease increases the amount of cholesterol in adults and weakens bones. Due to diabetes, there is a deficiency of insulin in the human body, due to which the amount of glucose in the body. starts increasing, its digestion is not done properly and insulin injections are given to meet the deficiency of insulin in the body. Due to this disease, there is a possibility Cholesterol increases are likely to be tuberculosis pneumonia and respiratory diseases. The *Trigonella foenum* is used globally for diabetes. Fenugreek seeds and leaves are most commonly used for diabetes and also reduce cholesterol, arthritis, wound, rashes and hair loss. *Trigonella foenum* is used for the production of breast milk in stomach malfunctioning heart disease pregnancy, as well as for male impotence and other treatment. *Trigonella foenum* for Diabetics is an amrit karya drug plant which is globally demanded for production. Therefore, fenugreek is said to be full of anti-oxidant and anti-disease properties.

SHM-103

A review of preclinical properties of *Vinca Rosea*

Anamika Vishkarma[1], Sachin Kumar Tyagi[2], Reetu Gour[3]
Director of pharmacy, Bharat institute of technology, Meerut
E-mail: ritugourbioinfo2@gmail.com

Vinca rosea (C. roseus) Linn (Apocynaceae) is an herbaceous plant also known as Madagascar periwinkle, Vinca rosea, or Lchnera rosea worldwide. It is cultivated mainly for its alkaloids, which are having anticancer activities. The two classes of active compounds in Vinca are alkaloids and tannins. Catharanthus roseus produces more than 100 monoterpenoids indole alkaloids (TIA) in different organs. The leaves and stems are the sources of dimeric alkaloids, vinacristine and vinblastine that are indispensable cancer drugs, while roots have antihypertensive, ajmalicine and serpentine. The leaves are used traditionally in various regions of the world including India, West Indies as well as Nigeria to control diabetes. The leaves have been known to contain 150 useful alkaloids among other pharmacologically active compounds. Significant antihyperglycemic and hypotensive activity of the leaf extracts (hydroalcoholic or dichloromethane-methanol) have been reported in laboratory animals. Fresh leaf juice of C. roseus has been reported to reduce blood glucose in normal and alloxan diabetic rabbits. Leaves and twigs of Catharanthus roseus have been reported to have hypoglycaemic activity in streptozotocin induced diabetic rats. In this study the prolonged effect (up to 12-14 day) of the methanolic extracts of whole plant of Vinca rosea in fasting blood glucose (FBG) and biochemical parameters such as serum total cholesterol (TC), LDL, HDL, creatinine, urea, and alkaline phosphatase were studied in alloxan induced diabetic rats.

SHM-104

Ficus benghalensis bark extract as herbal medicine for healing wounds

Ankita Raisagar[1], Anita Raisagar[2], Sangeeta Shukla[3]
[1]School of Pharmacy, LCIT, Bilaspur, Chhattisgarh
[2] Depertment of Dairy Microbiology, WCDT, SHUATS, Prayagraj
[3]Deptt. of Microbiology, WCDT, SHUATS, Prayagraj

In the present study, ethanolic extract of bark of *Ficus benghlensis* was evaluated for wound healing property. Extraction was done by maceration process. In phytochemical screening, ethanolic extract of bark of *Ficus benghalensis* showed presences of tannins, saponins, flavonoids, terpenoids and phenols whereas cardiac glycosides, carbohydrates, Proteins and alkaloids were absent. The Extract showed antimicrobial activity against both fungal and bacterial test organisms. The wound healing activity was evaluated through excision wound model with albino white mice. The extract healed wounds completely in 17 days while control group takes more than 20 days for wound healing. The main factor in wound healing might be presence of tannins, flavonoids, phenols and terpenoids. Phenols and flavonoids shows antioxidant properties whereas terpenoids and tannins shows antimicrobial properties. Tannins also act as detoxifying agent. Thus ethanolic extract of bark of *Ficus benghlensis* showed promising herbal medicine for wound healing.

SHM-105

Effect of *Curcuma longa* extract on the activity of lactic acid bacteria

Aparajita Asthana, Pooja Chauhan, Pradeep Kumar, Dinesh Kumar and Sandeep Kumar
Deptt. of Biotechnology Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut -250110.
E-mail: asthana.aparajita@gmail

Turmeric has been used traditionally in foods preparation and it is very rich in antioxidants and has antimicrobial properties, we used turmeric as an enhancer of probiotics activity of curd. Solution of turmeric was prepared in distil water and two broth samples of curd were taken. Turmeric was added in one of the sample and then growth was observed, it was observed that growth was better in the sample with turmeric hence the study suggests that turmeric has the ability to enhance the growth of probiotics.

SHM-106

A review of: *Cassia angustifolia* (Medicinal Crop)

Arti Kumari[1], Prof. Sachin Kumar Tyagi[2], Reetu Gour[3]
Bharat Institute of Technology, Meerut
E-mail: artikri23051998@gmail.com

Cassia Angustifolia (Senna) belongs to family leguminosae. It is available in large quantities. There are many other species of cassia are cassia alata, cassia fistula, cassia obovata, cassia podocarpa, cassia sieberiana, cassia sofora, cassia dantata, cassia javanica. It is a native plant of Yemen, Somalia and Arabica and now cultivated in other parts of world, has a variety of medicinal uses in unani as well as other traditional systems of medicine. The plant is mainly valued for its cathartic properties and is especially useful in habitual constipation. The laxative principles sennoside A and sennoside B, isolated from leaves and pods of senna, constitute important ingredients in purgative medicines. The plant has been investigated for its various chemical constituents and pharmacological properties. Being a hardy species, it can be grown even in saline and rainfed conditions. Cultivation of senna does not require much expense on irrigation, manuring, pesticides, protection and other pre- and post-harvesting care. This makes the plant an ideal crop for arid regions where water provision, wasteland development, desertification control, sand dune stabilization are the major challenges.

SHM-107

Development, Standardization and Validation of Analytical Methods for Quality Assurance and Quality Control of *Aloe*-based Pharmaceuticals

Bablu Kumar[1], Renu Bala Yadav[2], P. N. Raju[1], D.P. Pathak[1], Rajesh Arora[2]
[1]Delhi Pharmaceutical Sciences and Research University, Pushp Vihar, New Delhi-110017
[2]Phytochemistry and Analytical Toxicology Division, Defence Institute of Physiology and Allied Sciences, Timarpur, Lucknow Road, Delhi-110054
E-mail: bablukumarshah96@gmail.com

A number of Aloe-based pharmaceutical and nutraceuticals are available in the market. However, there is a need for appropriate standardization methods for the authentication and quality control of *Aloe*-based herbal products as its non-availability directly impacts the quality, safety and commercial prospects of products. Quality assurance (QA) and Quality control (QC) are important parameters to ensure reliability, safety, efficacy of top-selling herbal products that find use for prevention and treatment of a broad range of human ailments. Standardized herbal products are well accepted and have immense market potential. The present study has addressed the need for standardized analytical protocols for authentication and standardization of *Aloe*-based herbal products. Different samples of *Aloe vera* extracts, pharmaceuticals, nutraceuticals and four known standards (A=*Aloin*,

AC=*Acemannan*, AE=*Aloe-emodin*, RH=*Rhein*) were applied on TLC plate (silica gel 60 F254). Band lengths were maintained at 8 mm for all samples and standards. The plate was developed in mobile phase comprising of ethyl acetate: methanol: water (77:13.5:10 v/v/v) in a CAMAG twin trough development chamber. Detection for peak identification was carried out at 254 nm using CAMAG Scanner 3. Documentation was done by capturing images at 254 and 366 nm in a CAMAG Reprostar IV system. The QA/QC parameters were standardized *vis-à-vis* four standard compounds isolated from *Aloe vera viz. Aloin A, Acemannan, Aloe emodin* and *Aloe rhein.* The *Rf* value observed by HPTLC method was 0.5, 0.72, 0.7 and 0.65 respectively. Further, HPLC technique was also employed to quantitatively analyze the presence of various phytoconstituents. The QA/QC method developed, validated and standardized for quality parameters of *Aloe*-based pharmaceuticals and nutraceuticals is immensely useful for standardized herbal product development, characterization and testing of batch-to-batch variation.

SHM-108

Preparation and characterization of Rudraksha *(Elaeocarpus ganitrus)* Green Tea

Beena and Amar P. Garg
School of Biological Engineering & Life Sciences Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut-250110, INDIA
E-mail: beena.anshu1986@gmail.com

Rudraksha *(Elaeocarpus ganitrus)* is an evergreen tree belonging to the family Elaeocarpaceae. Rudraksha leaves possess various phytochemicals such as alkaloids, bioflavonoids, polyphenols and antioxidants that have many beneficial effects like reducing inflammation, ageing and help to fight against cancer. These substances can reduce the formation of free radicals in the body, protecting cells and biomolecules from damage. These free radicals are known to play an important role in ageing and various life style diseases. In the present study, preparation of "Green Tea" from Rudraksha leaves (100%) and in combination with Lemon *(Citrus limon)* leaves in different concentrations (50% Rudraksha and 50% lemon leaves) and (75% Rudraksha and 25% Lemon leaves) was used. Rudraksha and Lemon leaves were dried separately by different methods that included sunlight, microwave, hot air oven, shade and in desiccator. All these preparations were tested and drying under desiccator preserved its natural biocharacters as revealed by spectrophotometric analysis. The preparation was given to various people for giving their observations with respect to flavour and taste and we found that Rudraksha tea (100%) tasted good and preserved their natural therapeutic characters.

SHM-109

Bioprospecting Endophytic wealth from Medicinal Flora of North Western Himalayan Region

Brajeshwar Singh, Hemshiveta Pandita, Diksha Raina, Akanksha Rathore and Sneahpreet Kour
Division of Microbiology, Faculty of Basic Sciences, SKUAST-Jammu, INDIA
E-mail: brajeshbhau@yahoo.co.in

Himalayan region with its wide range of altitudes, topography and climatic conditions, is rich in medicinal wealth repository, occupying an important place in Vedic treatise. About 800 valuable medicinal species found in this part of India are extensively used by the locals since time immemorial for curing various human diseases. Medicinal plants sector possesses great potential to uplift the economy of India, however, various developmental and anthropogenic pressures on the forests, unscrupulous/unscientific exploitation of medicinal plants in the wake of their increasing national and a global trade demand have caused severe depletion of the medicinal plants resource base thereby affecting the health and livelihood options of the people. Medicinal plants are gaining global attention owing to the fact that the herbal drugs are cost effective, easily available and with negligible side effects. Bioactive natural products of medicinal plants have long been and will continue to be an important source of medicinal raw materials. The natural habitats for wild medicinal plants are being threatened by over-use and environmental and geopolitical instabilities. Phytochemicals reported in plants are cyanogenic glycosides, protease inhibitors, lectins, alkaloids, non-protein amino acids, saponins, steroids and tannins that can be derived from any part of the plant like bark, leaves, flowers, fruits, roots, seeds etc. Family of microorganisms that grow intra-and/or intercellular in the tissues of higher plants without causing over symptoms on the plants in which they live are designated as endophytes represent a potential source of novel natural products for medicinal, agricultural and industrial uses, such as antibiotics, anticancer agents, biological control agents, and other bioactive compounds. Common endophytes include a variety of bacteria, fungi and actinomycetes, and they can be isolated from wild or cultivated crops of either the monocots or dicots. Among the microbial group the most frequently isolated endophytes are the fungi. Endophytic fungi are considered as an outstanding source of bioactive natural products because there are so many of them occupying millions of unique biological niches growing in different types of environment. The search for new and effective antimicrobial agents has become a necessity due to rise in the number of super resistant strains and failure of currently used antibiotics against them leading to the increased global health concern. Various traditionally used medicinal plants for their ability to host endophytic fungi having antimicrobial potential have been undertaken world-wide.

.

SHM-110

Adansonia digitata: A traditional tree having several medicinal properties

Chhavi Goel, Maya Datt Joshi, Rupesh Kumar, Sandeep Kumar and Amar P. Garg
Deptt. of Biotechnology, Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut
E-mail: mayajoshi2778@gmail.com

Adansonia digitata belongs to the Bombacaceae family and is generally known as the African baobab .it is called kalvprishk in India .it is a massive tree up to 25m long and may live hundreds of years. It is considered to be queen of carbon storage tree as it absorbs huge quantities of carbon dioxide from the atmosphere. Baobab is strongly anchored in the soil by an extensive and strong root system that grows 2 m deep, and whose diameter may be higher than the tree height. The fruit pulp, seeds, leaves, flowers, roots, and bark of baobab are edible and they have been studied by scientists for their useful properties. The fruit pulp has very high vitamin C, calcium, phosphorus, carbohydrates, fibers, potassium, proteins and lipids content, which can be used in seasoning as an appetizer and also make juices. Seeds contain appreciable quantities of phosphorus, magnesium, zinc, sodium, iron, manganese, whereas they have high levels of lysine, thiamine, calcium and iron. Baobab has numerous biological properties including antimicrobial, anti-malarial, diarrhea, anemia, asthma, antiviral, anti-oxidant and anti-inflammatory activities amongst others. Phytochemical investigation revealed the presence of flavonoids, phytosterols, amino acids, fatty acids, vitamins and minerals. The trunk of the tree swell greatly during rainy season will absorb 1000 liters of water. From various parts of the plant various nutritional, Phytochemical constituents were isolated like Vitamin-C, steroids, flavonoids, epicatechin, campesterol, Tocopherol, adansonin, amino acid etc. it is used in the treatment of bronchial asthma, dermatitis, sickle cell anemia, diuretic, anti-diabetic, diarrhea, dysentery, laxative, hiccough in children, anti-oxidant, anti-inflammatory, antidote for poison, anti-trypanosome uses. The present article summarizes the review of pharmacognostical, Phytochemical, pharmacological activity.

SHM-111

Herbs and Health

Deepali Mudgal, B. R. Singh, Samsher, Puja
Deptt. of Agricultural Engineering (Process & Food Engg.)
S.V. Patel University of Agriculture Technology, Meerut (UP)
E-mail: mudgaldeepali@gmail.com

An herb is a plant or part of a plant valued for its medicinal, aromatic, or savoury qualities. Herbs are widely utilized in food and health industries. Their beneficial effects to the human body have been attributed to the presence of active phytochemical ingredients with some efficiency for disease treatment as well as for beauty and health enhancement. Public awareness on the adverse effects of synthetic chemical products also increased the demand for herbal products. Throughout human history,

herbs have been used in food, cosmetics and fragrances. In addition, they are a source of traditional medicines for the treatment of various illnesses and diseases. Herbal remedies or medicines consist of portions of plants or unpurified plant extracts containing several constituents. Herbal medicine or herbalism is the use of herbs or herbal products for their therapeutic or medicinal value. Herbal products have recently increased in importance in the treatment of health-related problems. A recent WHO report stated that 5.6 billion people, or approximately 80% of the world's population, use herbal products for their primary health care. Herbal products are currently being used as dietary supplements, nutraceuticals, health products, and traditional medicines. Phytochemical constituents in medicinal plants, such as flavonoids, phenolics and saponins, are believed to have numerous therapeutic abilities and are able to reduce the risk of multiple diseases, including inflammatory conditions and cancer.

SHM-112

Emblica officinalis (Amla) leaf extracts antibacterial activity on different pathogenic microorganisms

Ankita Gautam and Sangeeta Shukla
Deptt. of Dairy Microbiology WCDT SHUATS Allahabad.)
E-mail: ankita.gautam149@gmail.com

Emblica officinalis are traditionally used medicinal plants found in tropical and subtropical regions of India. Antibacterial activity of different extracts *E. officinalis* fruits were evaluated by agar well diffusion method against different pathogenic bacteria viz., *Escherichia coli, Pseudomonas aeruginosa and Bacillus cereus* in the present study. Maximum antibacterial activity was obtained against E. coli (ZOI = 17.0±1.0 mm and AI = 0.939) by methanol extract followed by aqueous extract (ZOI = 14.5±0.5 and AI = 0.801) of *E. officinalis* fruits. The MIC values of different extracts used in study ranged between 6.25-100 mg/ml. In this study, 6.25 mg/ml was recorded as MIC of methanol extract of *E. officinalis* fruits against E. coli. The results obtained from qualitative phytochemical analysis revealed that the plants contained bioactive secondary metabolites which may be connected with antimicrobial properties of plants. Therefore, these results clearly support the traditional use of *E. officinalis* fruits as a broadspectrum anti-microbial agent against a wide range of microbes.

SHM-113

Antioxidants present in ARTEMISIA ANNUA

Nidhi A
E-mail: nidhi911agrwal@gmail.com

Antioxidants in particular, represent a growing category of nutraceuticals. These compounds are able to mitigate some of the damage caused by free radicals – most often ROS- on the lipid present in the

cell membranes. Vitamin C act as a powerful antioxidant having ability to donate a hydrogen atom and form a relatively stable ascorbyl-free radical, Vitamin C is suggested to decrease oxidative damage and lowering the risk of certain chronic diseases. It possesses anti-inflammatory properties work on swollen and tired limbs under the effect of rheumatism and gout. *A. annua* to be used not just as an antioxidant, but also as a detox agent, and to improve the immune system, anaemia disorders, common cold and abdominal pain. *Artemisia annua* is an aromatic herb widely distributed in the cool temperate and subtropical regions. Oven dried plants part grounded in fine powder and aqueous and organic solution was prepared (10%). In my study, revealed that *A. annua* has maximum vitamin C concentration when compared with standard curve through HPLC. It observed 0.18mg/min in my sample in aqueous solution. *A. annua* required minimal watering and can be cultivated easily. Farmer should aware about the cultivation and maintenance of the same. It will be in a huge demand in an upcoming year.

SHM-114

Effect of *Tinospora cordifolia* and Metformin on Alloxan Induced Diabetic Mice–Kidney Function Study

Sneha Navin[1], Abhinav[1] and Ranjit Kumar[2]
[1]School of Biological Engineering and Sciences, Shobhit University Gangoh, Saharanpur, Uttar Pradesh-India
[2] Mahavir Cancer Institute and Research Centre, Patna, Bihar- India
E-mail: snehanavin9@gmail.com

Diabetes mellitus is a metabolic diseases marked by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is related with long-term damage, dysfunction, and failure of various organs like, especially the eyes, kidneys, nerves, heart, and blood vessels. Diabetes mellitus is a chronic illness that requires continuing medical care and patient self-management education to prevent acute complications and to reduce the risk of unending complications. This high blood sugar produces the classical symptoms of polyuria, polydipsia and polyphagia. In India, as per the 2011 estimates reported by the Indian Council of Medical Research–India Diabetes study, 62.4 and 77.2 million people have diabetes and prediabetes, respectively. It is predicted that by 2030, India's diabetes burden will be almost 87 million people. Present study included biochemical parameters of mice. Four groups of mice were prepared for comparative study on control, diabetic, *Tinospora cordifolia* and Metformin. Diabetic models were prepared in mice by intraperitoneal administration of single dose of alloxan@120mg/kg b.w. Alcoholic extract of *Tinospora cordifolia* was administered @200 mg/kg b.w/day for eight weeks. Metformin were administered @50 mg/kg b.w/day for eight weeks. In diabetic group of mice glucose, urea, uric acid and creatinine were increased. Effective restoration was observed in glucose, urea, uric acid and creatinine of *T. cordifolia* administered group in comparison to metformin administered diabetic group of mice. Thus, it was

concluded from study that alcoholic extract of T. cordifolia restores glucose level to normal. *Tinospora cordifolia* acts effectively on diabetes mice as good as metformin on biochemical parameters.

SHM-115

Therapeutic Potential of *Cinnamomum cassia* in Experimental Visceral Leishmaniasis

Garima Chouhan[1], Mohammad Islamuddin[2], Muzamil Y. Want[2], Farhat Afrin[3]
[1]Deptt. of Biotechnology, School of Engineering and Technology, Sharda University, Uttar Pradesh
[2]Parasite Immunology Laboratory, Deptt. of Biotechnology, Jamia Hamdard (Hamdard University), New Delhi [3]Deptt. of Clinical Laboratory Sciences, Faculty of Applied Medical Sciences, Taibah University, Kingdom of Saudi Arabia
E-mail: garima.chauhan@sharda.ac.in

Visceral leishmaniasis (VL), a clinically lethal form of leishmaniasis, is a vector borne ailment caused by *Leishmania donovani*. The disease which has been primarily endemic in tropical and sub-tropical countries has now spread far from its endemic foci due to its co-occurence with HIV. The chemotherapy in use is faulty and suffers from issues like grave toxicity, cost and emerging resistance. Hence, newer therapeutic interventions are required, and same also has been a national priority for India since quite a few years. Drug discovery from alternate natural resources is a widely accepted strategy as nature presents a gamut of potent antimicrobial compounds. Hence, in our current study, we investigated leishmanicidal potential of *C. cassia* bark dichloromethane fraction (CBD). CBD displayed significant anti-promastigote activity that was interceded via apoptosis. CBD exhibited potent anti-amastigote efficacy and conferred significant protection in *L. donovani* infected animals that was accompanied by restoration of T helper type (Th)-1-polarized mileu in cured animals. CBD was devoid of any toxicity *in vitro* and *in vivo*. Cinnamaldehyde and its derivatives may be responsible for the observed antileishmanial effect.

SHM-116

Standardization, Nutritional Composition and Sensory Evaluation of Fenugreek Seed Powder Supplemented Steamed *Vadi* for Diabetic Patients

Garima Dwivedi and Sadhna Singh
Deptt. of Food Science and Nutrition, College of Home Science,
Acharya Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya
E-mail: garimadwivedi19950@gmail.com

The study entitled "Standardization nutritional composition and sensory evaluation of fenugreek seed powder supplemented steamed *vadi* for diabetic patients" was undertaken to add variety in food choice

for diabetic patients. Steamed *vadi* is based on Bengal gram dal and steamed in a steamer. The seeds of fenugreek can use orally for reduction in blood glucose level. Thus an attempt was made to prepare steamed *vadi* consist of low glycemic index. Fenugreek seed powder exposed to various treatments like raw, roasted, germinated and germinated then roasted. The effect on these treatments on standardization, nutritional composition, sensory score and cost/economics of product was ascertained. Result revealed the steamed *vadi* supplemented with raw fenugreek seed powder score card significantly higher score for colour, appearance, aroma, texture, taste and overall acceptability. As the level of supplementation of fenugreek seed powder increased, the sensory scores for all aspect decreased significantly but still liked very much on Nine Point Hedonic Rating Scale. The crude protein (S_0- 20.80, S_1- 21.45, S_2- 22.10, S_3- 22.75 g), crude fibre (S_0- 1.20, S_1- 1.85, S_2- 2.49, S_3- 3.14 g), total ash (S_0- 2.70, S_1- 2.86, S_2- 3.02, S_3- 3.18 g), calcium (S_0- 56.00, S_1- 56.77, S_2- 57.49, S_3- 58.42 mg) and iron (S_0- 5.30, S_1- 5.79, S_2- 5.85, S_3- 6.25 mg) contents of steamed *vadi* increased significantly with increase in the level of supplementation with fenugreek seed powder. However, no significant effect of treatments like roasted, germinated and germinated then roasted followed by raw on energy, carbohydrates, crude fat and calcium content was found but crude protein (T_1- 21.26, T_2- 22.39, T_3- 23.11, T_4- 23.77 g), crude fibre (T_1- 2.09, T_2- 2.10, T_3- 2.24, T_4- 2.25 g), total ash (T_1- 2.90, T_2- 2.91, T_3- 2.97, T_4- 2.99) and iron (T_1- 5.93, T_2- 5.63, T_3-5.77, T_4- 5.87 mg) value varied significantly. Thus it is recommended that raw fenugreek seed powder may be supplemented in preparation of steamed *vadi* to increase their nutritional value and to improve the glycemic index of diabetic patients.

SHM-117

Medicinal Plants and Its Management for Epidemic Flu

Khyati Lehari, Vishakha Burman, Aastha, NareshPratap Singh, Mukesh Kumar and Vaishali
Deptt. of Ag. Biotechnology, S.V.P.U.A. &T, Meerut

People frequently brush off flu as a mere annoyance, but the infection kills hundreds of thousands lives each year based on the (CDC's) Centers for Disease Control statistical assessments. The swine flu (H1N1 virus) is one among the life threatening epidemic which can be prevented and managed by medicinal herbs or Ayurvedic means. Extracts of medicinal plants, originating from the tropical rainforests of Borneo used as herbal medicines by traditional healers to treat flu-like symptoms, were tested against the H1N1 and H3N1 subtypes of the virus. Likewise, Indigo plant (*Wrightia tinctoria*) (2.25 lg/ml) was one of the best antidotes against H1N1 virus in terms of inhibitory concentration of 50% (IC50). Findings from this study state that the plant *W. tinctoria* can be a potent source for third generation anti-viral drug development against H1N1. Further if someone suffers from the disease, than there are various herbal formulations to control this fatal disease. The concept of immuno- stimulation through medicinal plant has been used successfully in the treatment of immune compromised conditions. The word "Licorice" refers to the root of a plant called *Glycyrrhiza glabra.* It's native to Europe and Asia.Various plant extracts stated as Licorice (*Glycyrrhiza glabra*) contains antiviral activity anti-inflammatory, antioxidant and immune-modulating activities, Tulsi (*Ocimum sanctum*)contain antimicrobial properties,Garlic (*Allium sativum*)contains anti-inflammatory, antiviral,

antibacterial and immune-boosting,Amla (*Phyllanthus emblica*) contains anti-viral activity,Guduchi (*Tinospora cordifolia*)contains anti-periodic, anti-pyretic, alterative, diuretic and anti-inflammatory properties, Kalmegh (*Andrographis paniculata*) containsanti-inflammatory, antipyretic (anti-fever), antiviral, and immunostimulatory properties,Ashvagandha (*Withania somnifera*) contains Stimulant for the immune system, also a very potent adaptogen, Turmeric (*Curcuma longa*)contains antioxidant, anti-inflammatory properties,Neem (*Azadirachta indica*) contains antidiabetic, antibacterial, and antiviral properties,Bael (*Aegle marmelos*) contains analgesic, anti-inflammatory, antibacterial, and antiviral properties,Mentha (*Mentha piperita*) contains antimicrobial and antiviral activity and Haritaki (*Terminalia chebula*) contains Inflammatory, anthelmintic, cardiotonic, aphrodisiac, and restorative properties. These various medicinal plants extract contain antiviral and anti-bacterial properties against epidemic flu as well as it would be beneficial for various novel viruses *eg.2019*-nCoV

SHM-118

An Ethnobotanical Study of Medicinal Plants of Mayurbhanj district of Odisha, India

Lipika Mohanta and Vishnu Shankar Sinha
Deptt. of Botany, Tata College, Chaibasa, West Singhbhum, Jharkhand-833202.
E-mail: lipika.2k19@gmail.com

The present paper reports the ethno-botanical survey of 20 medicinal plant species belonging to 14 families are being frequently used to cure various diseases (diarrhea, dysentery, cough and cold, dropsy, anti-helmintic, muscular pain, UTI, skin diseases, leprosy, scorpion bite etc.) by the rural and different tribal people of Mayurbhanj District of Odisha, India. Ethnobotanical survey was conducted during July 2019 - December 2019 through regular trips in different seasons of rural and tribal rich areas of Mayurbhanj District of Odisha, India for collection, identification and ethno medicinal enumeration of indigenous plants. It was carried out by interviews with local 10 Vaidyas, 12Kaviraj, 12 informants, 12 village head man and 60 patients to know the plant species which are frequently used for the treatment of different diseases and their dosage, duration, method of preparation, mode of administration. The collected plant species were preserved as herbarium specimen and identified with the help of many reference books like Botany of Bihar and Odisha (H.H. Haines, 1921), Herbarium flora of Dehradun (C.R.Babu, 1977) and the information regarding the medicinal values was compared with other available literature like Indian medicinal plants (Kritikar and Basu, 1981), Glossary of Indian medicinal plants (Chopra et al 1996). The observations suggest that Qualitative, quantit and pharmacological studies of these plant species may be carried out as well as conserve this wealth of medicinal plants in the interest of mankind.

SHM-119

Effect of date palm (*Phoenix dactylifera* L.) as dietary supplement on type 2 diabetes mellitus

***Mohammad Mustufa Khan*[1], *Tarun K. Upadhyay*[2], *Jasarat Ali*[3], *Dinesh C. Sharma*[4]**
[1]School of Biological Engineering & Sciences, Shobhit University Gangoh, Saharanpur, U.P.
[2]Biotechnology, School of Applied Science and Ag. Research, Suresh Gyan Vihar University, Jaipur
[3]Deptt. of Agriculture, Himalayan College of Agriculture and Forestry, RIT Roorkee, Haridwar
[4]Deptt. of Life Sciences and Allied Health Sciences, Glocal University, Saharanpur, U.P.
E-mail: mustufakhan01084@gmail.com

The date palm (*Phoenix dactylifera* L.) is one of the oldest cultivated plants in the gulf region, occupying about 30% of the cultivated land. There are more than 2000 different varieties of date palms which have been used as a traditional food for over last 6000 years. Date palms are rich in carbohydrates (total sugars, 44-88%), salts, minerals, vitamins, fatty acids (0.2-0.5%), proteins (2.3-5.6%), and fibers (6.4-11.5%). It contains active constituents like anthocyanin, phenols, sterols, carotenoids, procyanidins, and flavonoids which can improve oxidative stress in pancreatic beta cells and also help to restore insulin production. Changes in dietary patterns, sedentary lifestyle and increasing stress are contributing factors for the high prevalence of diabetes mellitus. Diabetic complications often lead to cardiovascular diseases, hypertension, and hyperlipidemia that are the leading cause of death and disability worldwide. Apart from pharmacotherapy, the use of anti-hyperglycaemic medicinal food may be a new aspect of diabetes management and prevention of its complications. Studies have reported that date palms have low glycemic indices (GIs) and consumption by diabetic patients have shown non-significant postprandial glucose excursions. It has anti-diabetic and anti-oxidant properties and its consumption has been shown to reduce blood glucose levels in hyperglycaemic patients. It also slows the rate of glucose absorption, reduces insulin resistance and/or enhances insulin secretion. The study showed that the prolong treatments with the date palm extract restore the function of the liver, kidney, and also balance the oxidative stress condition in diabetic treated rats. It showed potential protective effects against early diabetic complications of both liver and kidney by its anti-oxidant and free radical scavenging capabilities. Further pre-clinical and clinical prospective studies are needed to evaluate the effects of long-term consumption of date palms on the prevention and management of diabetes and its complications.

SHM-120

Tremendous Activity of Herbal Drugs against Nephrolithiasis

Mohd Tasleem and Mamta Baunthiyal
Deptt. of Biotechnology, G B Pant Institute of Engineering & Technology, Pauri-Garhwal, Uttarakhand
E-mail: mohdtasleem99@gmail.com

Urolithiasis (nephrolithiasis) or kidney stone is formation of urinary calculi at any level of urinary tract. They are crystal aggregations formed in the kidneys. It is estimated that 12% of world population experiences renal stone disease with a recurrence rate of 70-80% in male and 47-60% in female. Urinary calculi are the third most common affliction of the urinary tract which is exceeded by the urinary tract infections and prostate diseases. The most common type of kidney stones worldwide contains calcium. For example, calcium-containing stones represent about 80% of all cases in India. The presence of renal calculi is diagonised by the symptoms explained by the patients and the stones are recognized in the body with the help of X-rays. An attempt has been made during the last decade to study the identical, chemistry, pharmacology and clinical investigations of Pashanbheda plants used for dissolving kidney stones. Herbal drugs have created interest among the people by its clinically proven effects like immunomodulation, adaptogenic and antimutagenic. Number of medicinal plants shows antiurolthiatic activity and play vital role in prevention of disease. Here an attempt has been made to emphasis on potent indigenous herb for urinary stone. We have studied of two medicinal herbal plants *Macrotyloma uniflorum* and *Bergenia ciliata*. Horse Gram is scientifically known as *Macrotyloma uniflorum*. According to our study, *B. ciliata* showed maximum litholytic activity as compare to *M. uniflorum* dissolving renal stones. The observed beneficial effects in the management of urolithiasis following an herbal formulation treatment could be due to the prevention of urinary supersaturation and inhibition of mineralization of stone forming constituents.

SHM-121

Extraction of active medicinal components from *Adansonia digitate*

Mujeeb Ur Rehman, Maya Datt Joshi, Sandeep Kumar, Rupesh Kumar and Amar P. Garg
Deptt. of Biotechnology, Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: mujeeb.biotech@gmail.com

Adansonia digitata L.is a majestic tree admired in African continent for its medicinal and nutritional value and also revered in India. The plant parts are used to treat various ailments such as diarrhoea, malaria and microbial infections. It is reported that it is an excellent anti-oxidant due to the vitamin C content which is seven to ten times higher than the vitamin C content of oranges. The results obtained showed the presence of several types of phenolic compounds; namely tannins, flavonoids, anthocyans,

coumarins, and other secondary metabolites such as alkaloids, sterols and terpenes, essential oils, saponins and quinones. The thin layer chromatography (TLC) is perform first to confirm the qualitative characterization of phytochemical screening, second to separate different molecules of each secondary metabolite and show the diversity in metabolite extracts. The TLC results are presented in the form of spots and frontal reports Rfs reflecting the plurality of component molecules in both of studied plants.

SHM-122

Immunomodulatory effects of Curcumin in Paraquat induced airway inflammation

Namitosh Tyagi[1] and Rashmi Singh[2]
[1]School of Biological Eng. & Science, Shobhit University, Gangoh-247341
[2]Deptt. of Zoology, MMV, Banaras Hindu University, Varanasi - 221005
E-mail: k.nami1728@gmail.com

Paraquat (PQ) an extensively used herbicide, is highly toxic to humans and animals. PQ toxicity is a global health issue since its introduction to agriculture, it can cause severe toxicity in many organs but it mainly accumulates in lungs which leads to cellular damage, acute lung injury (ALI) and pulmonary fibrosis. The molecular mechanism of PQ toxicity is based on cyclic oxido-reduction of paraquat, which generates superoxide anion and other oxygen free radicals. The present study evaluates role of intranasal curcumin against paraquat induced airway inflammation. Mice were pretreated with curcumin (5mg/kg, i.n) an hour before single toxic dose of PQ (50mg/kg, i.p). After 48hr of PQ intoxication, cellular infiltration in lungs, inflammatory cytokines and different oxidative stress markers were quantified and analysed. PQ intoxication resulted in significant increase in recruitment of inflammatory cells, ROS levels and proinflammatory cytokines level (TNF-α and IFN-γ) leading to lung endothelial damage. Significant reduction in the inflammatory cell recruitment to the lungs were observed after intranasal curcumin pretreatment (all $P < 0.05$). RT PCR analysis demonstrated that mRNA expression of IL-6 and IL-1β were increased due to PQ intoxication and decreased in the curcumin pretreated mice groups. Being anti-inflammatory, curcumin via intranasal route may prove as new therapeutic tools for PQ induced airway inflammation by regulating the expression of inflammatory mediators.

SHM-123

Antimicrobial effects of *Curcuma longa* rhizome extract against some selective bacterial pathogens

Neha Pal[1], Maya Datt Joshi, Rupesh Kumar, Sandeep Kumar and Amar P. Garg[2]
Deptt. of Biotechnology, Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: palneha1990@gmail.com

Plant derived medicine or herbs have made a huge contribution to human health *Curcuma longa* was significantly proven to have antifungal and antiviral effects. In the study antibacterial activity of *Curcuma longa* was investigated against selective bacteria by using disk diffusion method. Three type of solvent extraction were prepared, Benzene, Acetone and Methanol extraction. Extracts were tested against three selective bacteria: *E. coli*, *K. pneumoniae* and *P. aeruginosa* at 100% concentration. This is followed by (MIC) Minimum inhibitory concentration test to identify the lowest concentration which can inhibit the bacteria. The result shows that extractions had antibacterial potential against all selective negative bacteria. Thus, it is suggested that *Curcuma longa* rhizome extracts has a potential to kill gram negative pathogenic bacteria.

SHM-124

Physicochemical & Phytochemical Analysis of Mango (*Mangifera Indica*) Leaves

Sweety Pal, Nishant Chauhan, Amit Kumar Singh, and Shiva Sharma
Deptt. of Biomedical Engineering, Shobhit Institute of Engineering and Technology, Meerut

The plant kingdom has been the safeguard for the survival of the humans throughout recorded history, due to its use in many traditional medicine systems throughout the world for thousands of years and continues to provide mankind with new remedies. The research on plants of medicinal importance is rapidly increasing at the National and International level. The use of plants as a source of medicine has been inherited and is an important component of the health care system in India. One of the many fruit plants leaves mango (Mangifera indica) belonging to the family Anacardiaceae, is one of the major fruit crops in India. Besides fruit yielding, this plant is used for various other therapeutically purposes like managing diabetes & respiratory problem. The aim of the present study was to evaluate the physicochemical and phytochemical analysis of Indian mango leaves collected from Shobhit University, Meerut. The physicochemical properties such as ethanolic extract of mango leaves, loss on drying, total ash value, the phytochemical properties such as alkaloids, flavonoids, tannins, protein, lipid, carbohydrate, pH, volatile matter, fixed carbon contain has been found. The present study

provides the details of physicochemical and phytochemical properties of mango leaves which are useful in laying down standardization and pharmacopeia parameters.

SHM-125

Medicinal and pharmacological properties of Turmeric (*Curcuma longa*)

Reetu Gour[1] and A.P. Garg[2]
[1]Deptt. of Microbiology, Ch. Charan Singh University, Meerut-250004 (India) [1]
[2]School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology, (Deemed to be University), Modipuram, Meerut-2501102
E-mail: amarprakashgarg@yahoo.com

Turmeric is a natural antiseptic plant and a very important spice in India. It obtained rhizomes of plant *Curcuma longa* which is a member of the Zingiberaceae family. Turmeric forms a part of most Indian curry powder. Due to its colour and its spicy form sometimes it is also called the 'Indian saffron'. The active constituents of turmeric are the flavonoid curcumin (diferuloylmethane) and various volatile oils, including tumerone, atlantone, and zingiberone. Water and fat soluble extracts of turmeric and its curcumin component exhibit strong antioxidant activity, comparable to vitamins C and E. Turmeric's hepatoprotective effect is mainly a result of its antioxidant properties resulting in enhanced cellular resistance to oxidative damage as well as its ability to decrease the formation of pro inflammatory cytokines. Curcumin administration significantly decreased liver injury in test animals compared to controls and Turmeric extract also inhibited fungal aflatoxin production by 90% in addition to the role of turmeric and curcumin in reversing biliary hyperplasia, fatty changes, and necrosis. Studies showed that oral administration of curcumin in instances of diabetes, cancers, gastrointestinal disorders and neurological diseases. Curcumin may also be applied topically to counteract inflammation and irritation associated with inflammatory skin conditions and allergies. Curcumin ability to inhibit carcinogenesis at three stages: tumor promotion, angiogenesis, and tumor growth. This review focuses on the medicinal and pharmacological benefits of turmeric in prevention and treatment of diseases. The information was collected from articles that have been published in pubmed and which are available online

SHM-126

Design & Development of a Novel Formulation for Prophylaxis and Management of Cold Injury at High Altitude

Renu Bala Yadav[1], Rajesh Arora[1], Dharam Pal Pathak[2]
[1]Defence Institute of Physiology and Allied Sciences, Defence Research and Development Organization, Lucknow Road, Timarpur, Delhi-110054
[2]Delhi Pharmaceutical Sciences and Research University, Pushp vihar, New Delhi
E-mail: yadav.renubala20@gmail.com

Cold injuries are common in sub-zero temperatures, and occur when the temperature falls to 28°F (-2°C) and tissue freezes, which results in formation of intracellular ice crystals and micro-vascular occlusion. The pathophysiology of cold injuries is complex and tissue damage may result from direct change at cellular level or secondary effect of vasoconstriction taking place due to desensitization of receptor, which leads to extra and intra cellular ice formation followed by ischemia and thrombosis. Beside this, non-freezing cold injuries (such as chilblains, frostnip and trenchfoot) more frequent cold injuries due to constant exposure to cold wind and saturated humidity. Our soldiers are posted in high risk environmental conditions are susceptible to cold injuries and thus it is imperative to develop products and strategies to manage the challenges occurring at high altitude. On the basis of pathophysiology of the cold injuries, some of the active phytoconstituents were selected in the range of (2-6% w/w) with a smart targeting approach and their optimization was done by using response surface methodology by employing *in-vitro* drug release and permeation rate methodology. HPTLC and HPLC were used for standardization of phytoconstituents. Further Quality-by-Design approach as per pharmacopoeial guidelines was applied for optimization of product and quality control parameters. Rat skin model was used for induction of frostbite in healthy Sprague Dawley Rats (4-8-week-old; female; 170-185 g. b. wt) and safety studies were conducted as per OECD guidelines and efficacy study of the optimized formulation was carried out. The novel antifrostbite topical formulation was tested on animals and the optimized formulation was found to be effective ($p<0.05$) against tissue-freezing injury vis-a-vis standard and it was found that polyherbal formulation restricts the alterations at cellular level as evidenced by histopathological observations. The novel topical formulation specifically has potential for use in the management of cold injuries occurring at high altitude under extremes of cold.

SHM-127

Microbiological Assessment of Betel Quid for Antibiotic Resistance & Susceptibility against Bacterial Isolates

Ruchika, Rupesh Kumar, Sandeep Kumar, Maya Datt Joshi & Amar P. Garg
Deptt. of Biotechnology, Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: ruchikatomar25@gmail.com

In India, Betel Quid is used as traditional mouth freshner mostly eaten after a meal for digestion. The road side available Betel Quid commonly consumed by majority of population are considerd vulnerable from hygiene point of view. The study showed the dominance of pathogenic micro-oraganism which includes *Escherichia coli, Staphlyococcus aureus, and Pseudomonas aeruginosa*. The continous and highly consumption of Betel Quid may lead to disease like diabetes, stroke and cardiovascular disease. Thus in present scenario consumption of contaminated Betel Quid has become a major health concern. The objective of this study is to determine the microbiological assesssment of Betel Quid. Besides this all the bacterial isolates were checked for their resistance and susceptibility pattern against clinically significant antibiotics.

SHM-128

Comparative study of antimicrobial potential of aqueous extract of Pudina, Indrajav, Atis and Kalmegh

Sangeeta Shukla[1], Rajesh Shukla[2], Pramila Gupta[3]
[1]Assistant Professor, Deptt. of Microbiology, WCDT, SHUATS, Prayagraj
[2] Head Quality, Biogene Laboratory, Prayagraj
[3]Secretary, Yash Krishi Takniki Evam Vigyan Kendra, Prayagraj
E-mail: sangeeta.upadhyay@shiats.edu.in

Aqueous extracts of medicinal plant *Mentha piperita* (fresh leaves), *Aconitum heterophyllum* (roots), *Holarrhena antidysenterica* (seeds) and *Andrographics paniculata* (dry leaves) were evaluated for antibacterial activity against the growth of diarrhoea causing strains of *Escherichia Coli*. Among the selected plant extracts, aqueous extracts of *Mentha piperita* and *Holarrhena antidysenterica* showed inhibitory activity against the growth of *Escherichia coli.* There was a significant antibacterial effect of extracts of pudina (*Mentha piperita) and* indrajav (*Holarrhena antidysenterica*) at 5%, 10% and 15% concentration against diarrhea causing *Escherichia coli* whereas at the same concentrations, Atis *(Aconitum heterophyllum*) and Kalmegh *(Andrographis paniculata)* were not found effective against *Escherichia coli.* Thus the use of pudina (Mentha piperita) and indrajav (*Holarrhena antidysenterica*) in traditional medicine against diarrhoea is justified.

SHM-129

Phytochemical screening and analysis of antioxidant properties of various extract of Eucalyptus

Snigdha Tiwari, Beena Rawat, Mumrez
Deptt. Agriculture and Agri-informatics, Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: snigdha.tiwari07@gmail.com

Eucalyptus plant belongs to the Myrtaceae family, commonly known as safeda. Eucalyptus leaves show many activities such as antioxidant, antiseptic and anti-inflammatory. Besides antimicrobial activity, the essential oil and its constituents also show herbicidal, insecticidal, anthelmintics, anti-tumor, anti-leech activity. The phytochemical content of Eucalyptus leaves was analyzed by soxhlet extraction of the dried leaves using methanol and petroleum ether. Maximum amount of phytochemicals present in eucalyptus leaves were retained in methanolic extract. The methanolic extract contained carbohydrates, proteins, alkaloids, phenols, flavonoids & tannins except steroids while in petroleum ether extract all respective phytochemicals were present. Both the extracts were found to be effective in showing antioxidant activity through DPPH scavenging activity assay. The IC50 values for methanolic and petroleum ether came out to be 8.50ug/ml and 9.40ug/ml. The IC_{50} values are comparable with the standard, Ascorbic acid (11.2ug/ml).

SHM-130

Identification of phenolic acids and curcuminoids in Turmeric (*Curcuma longa* L.) using chromatography

Vishakha Burman[1], Naresh Pratap Singh[2], Vaishali[1], Khyati Lehri[1], Neelesh Kapoor[4], Rekha Dixit[3]
[1]Deptt. of Biotechnology, College of Agriculture, SVPUA&T, Meerut
[2] Dept. of Commercial Biotechnology, College of Biotechnology, SVPUA&T, Meerut
[3]Dept. of Biochemistry and Physiology, College of Biotechnology, SVPUA&T, Meerut
[4]Dept. of Finger Printing, College of Biotechnology, SVPUA&T, Meerut, INDIA.

Curcuma longa (turmeric) is a rhizomatous perennial herb of Ginger family. In the form of root powder, turmeric is used for its flavouring properties as a spice, food preservative, and food-colouring agent and has therapeutic uses as it is credited with a variety of important beneficial properties such as its antioxidant, antibacterial, anti-inflammatory, analgesic, and digestive properties. In addition, turmeric also has a variety of pharmacological activities due to its bioactive compound curcumin, the yellow color pigment of turmeric. It is a powerful antioxidant, anti-parasitic, antispasmodic and anti-in-flammatory compound, which may also inhibit carcinogenesis. Plants synthesize a vast range of

secondary metabolites with a significant portion consisting of phenolic compounds and flavonoid compounds. The total phenolics are secondary byproducts and play a significant role in defense mechanism of plant. Some of these secondary metabolites have antioxidant property as they promote health by removing reactive species that may otherwise exert harmful metabolic effects. In general, maximizing antioxidant concentrations is thought to minimize the risk for chronic disease. Study was conducted on 24 germplasm collected from different places of India. Quantification and qualitative evaluation of phenolics was done using Thin Layer Chromatography which shows the presence of different phenolic compounds in all turmeric germplasm. The results of TLC of total phenolics from the turmeric germplasm indicated the presence of caffeic acid in all the turmeric germplasm except the germplasm collected from Faizabad.The germplasm from Jhansi and Faizabad showed high concentration of phenolic compounds which will be beneficial for medicinal purpose.

SHM-131

Anti-adipogenic Effects of Novel Polyherbal Formulation in 3T3-L1 Adipocytes

Laxmi Bisht[1], Alpana Joshi[2], and Subrata K Das[3]
[1]Drug Discovery & Development, Patanjali Research Institute, Haridwar
[2] Deptt. of Agriculture & Agri-Informatics, Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut
[3] School of Medical Science &Technology, Indian Institute of Technology, Kharagpur
E-mail: lakshtheaim@gmail.com

Ayurvedic form of medicine is believed to be existent in India for thousands of years. There are about 45,000 medicinal plant species in India, with concentrated spots in the region of Eastern Himalayas, Western Ghats and Andaman & Nicobar Island. India is the largest producer of medicinal herbs and is called the botanical garden of the world. The present study demonstrates a novel polyherbal formulation PRI2018 inhibiting adipocyte differentiation in 3T3-L1 mouse adipocytes. PRI2018 is formulated by combining hydro-alcoholic extracts of five Indian herbs Bakuchi (*Psoralea corylifolia*), Bahera (*Terminalia bellirica*), Jamun (*Syzygium cumini*), Harad (*Chebulic Myrobalan*) and Amla (*Phyllanthus emblica*). Phytochemical analysis of PRI2018 revealed the presence of alkaloids, phenolic, flavonoids and, saponins. Oil-Red-O staining of 3T3-L1 adipocytes reveals that PRI2018 is a synergistic formulation that inhibits adipogenesis by reducing intracellular lipid accumulation and triglyceride contents in a dose-dependent manner. In addition, PRI2018 down-regulated mRNA expression of major adipogenic transcriptional factors: Peroxisome proliferator-activated receptor gamma (PPARγ) and CCAAT/enhancer-binding protein (C/EBPα) and adipogenic marker genes (LPL, AP2 and, adiponectin) in 3T3-L1 pre-adipocytes. Taken together, the results suggest that PRI2018 inhibits lipogenesis by inhibiting lipid and triglycerides accumulation; and by downregulating the expression of central adipogenic genes along with inhibition of specific biochemical processes.

SHM-132

Comparative Study of the Preliminary Phytochemical Screening and Antioxidant Activity of Five Medicinal Plants of Garhwal Himalayas

Monika Kawra and Sarla Saklani
Deptt. of Pharmaceutical Chemistry, HNBGU Srinagar Garhwal, Uttarakhand
E-mail: kawra.monika8@gmail.com

The Garhwal Himalayan region is rich in plant species, including many medicinal plants, greatly valued by local inhabitants for health care needs. In this study five different medicinal plants i.e, *Bunium persicum*, *Dactylorhiza hatagaria*, *Satyrium nepalense*, *Urtica diocia*, and *Viscum album* of Garhwal Himalayan region were screened for the presence of major phytochemical compounds and also analysed for their antioxidant activity. The air dried and selected part of each plant were extracted with methanol using soxhlet extraction method. Phytochemical screening of methanolic extract of each plant was resolute through standard biochemical analysis and their antioxidant activity was examined by DPPH assay. All the plants showed the presence of carbohydrates except *Urtica diocia*, *Satyrium nepalense* and *Dactylorhiza hatageria* showed the presence of alkaloids, flavonoids, saponins, and steroids. *Viscum album* and *Urtica diocia* showed the presence of flavonoids and phenols. *Bunium persicum* didn't showed the presence of saponins and flavonoids. DPPH free radical scavenging activity indicated that the methanolic extract of *Satyrium nepalense* possesses the maximum antioxidant activity while the lesser was found in *Urtica diocia*. IC50 value of methanolic extracts of *Bunium persicum*, *Dactylorhiza hatageria*, *Satyrium nepalense*, *Urtica diocia* and *Viscum album* were 0.09mg/ml, 0.21mg/ml, 0.04mg/ml 0.42mg/ml and 0.14mg/ml, respectively. This result reveals that *Satyrium nepalense* contains potent phytochemicals and thus further studies can be done for its therapeutic uses.

SHM-133

Nutritional Aspects of Blue Green Algae *Spirulina*

Neha, Y. Vimala, Ashu and Devendra Kumar
Deptt. of Microbiology, C. C. S. University, Meerut, India
E-mail: monidhillon81@gmail.com

Cyanobacteria, also known as blue-green algae, cyanoprokaryotes and cyanophytes, are photosynthetic prokaryotes comprising a single phylogenetic group within the domain bacteria. They have photosystems I and II and use water as an electron donor during photosynthesis, leading to the production of oxygen. Several cyanobacteria can also perform anoxygenic photosynthesis using only photosystem I if electron donors such as hydrogen sulphide are present. Cyanobacteria have a long evolutionary history and documented fossil records date back to about 3500 million years ago. One of

the most important cyanobacteria is *Spirulina* which is also called super food because it has many nutraceuticals values. It is commercially produced in large outdoor ponds under controlled conditions. Potential health benefits of *Spirulina* are mainly due to its chemical composition, which includes proteins (the highest protein content of any natural food, 55–70%), carbohydrates, essential amino acids, minerals (especially iron), essential fatty acids, vitamins and pigments. In this respect, three major bioactive components of *Spirulina*, the protein phycocyanin (a biliprotein pigment), sulfated polysaccharides and gamma linolenic acid seem to play significant roles in imparting improved human body functions. Phycocyanin operon locus (cpcB-IGS-cpc-A) and 16S rRNA aspects are also studied in present study.

SHM-134

Antimicrobial Property of *Carica papaya* Leaves

Pooja Chauhan, Amita Saxena, Prachi khare, Sandeep Kumar, Rupesh Kumar, Maya Datt Joshi and Amar P. Garg
Deptt. of Biotechnology Shobhit (Deemed University, Meerut 250110)
Corresonding author- Pooja Chauhan
E-mail: poojachau4441@gmail.com

Carica papaya has been used medicinally to treat an extremely broad range of ailment including intestinal worms, dengue fever and diabetes. Papaya leaf also have medicinal property and antioxidant properties. We use papaya leaf extracts to check its antimicrobial property. Extract of *Carica papaya* leaf was prepared by using the soxhlet using organic solvent and were used to check antimicrobial activity against some human pathogenic bacteria like E. coli., salmonella by using agar well diffusion method. Phytochemical such as alkaloid, saponins, flavonoids, and glycoside were present in the extract. These phytoconstituent were responsible for the antimicrobial activity of the plant. This experiment concludes the antimicrobial property of the leaf extract of *Carica papaya*.

SHM-135

Ethnobotanical study of Con*servation of religious plant practices for Buddhism*

Pawan Prakash Yadav and Rajumar Mishra
P G Deptt. of Botany, Maagadh University Bodh Gaya- 824234.

The present paper deals with *Con*servation of religious plant practices in Buddhism. trees in Buddhism because various events of Buddha's life are interconnected and interwoven with these plants *viz.*, Ashok, Bar, Bel, Jamuna, Kush, Pipal, Saal, bamboo and mango trees**.** Buddha got first knowledge about life under the Jamuna (*Syzygium cumunii*) tree. The four events i.e., the birth, the enlightenment,

the spreading out of enlightenment and Mahaparinirvana (salvation) in Buddha's life took place under the Ashok (*Saracaka indica*), Pipal, Bel, and Saal trees. Buddhist people perceive Ashok, Bar, Bel, Jamuna, Kush, Pipal, Saal, bamboo and mango trees symbolically meaningful in their religious life.

SHM-136

Evaluation of Total Phenolics, Flavonoids contents and Phytochemical analysis of *Calendula officinalis* Leaf Extracts Grown in Different Doses of Fly Ash

Sumedha Mohan, Ayushi Varshney, Praveen Dahiya
Amity Institute of Biotechnology, Amity University Uttar Pradesh (AUUP), Sec-125, Noida, India
E-mail: pdahiya@amity.edu

This study was designed to evaluate the phytochemical analysis, total flavonoids and phenolic content of *Calendula officinalis* leaf extracts grown in various soil fly ash amendments. *Calendula officinalis* were grown in different fly ash-soil doses (control soil, 30% fly ash, 60% fly ash and 100% fly ash). The dried leaves were collected and extracted with ethanol, methanol and water. The prepared ethanol, methanol and water crude extracts were used for the evaluation of total phenolic, flavonoids contents and phytochemical analysis. The established conventional methods were used for quantitative determination of total phenolics and flavonoids contents. Phytochemical screening of all the extracts prepared confirmed the presence of carbohydrates, tannins, steroids, triterpenoids, flavonoids and coumarins. Glycosides was found to be present only in ethanol and methanol extract. The results of quantitative estimation of phytoconstituents (phenolic compounds and flavonoids) revealed that the phenolic compounds and flavonoids increased with respect to increased application of fly ash from control soil to 60% fly ash treatment and then gradually decreases. The methanolic extract of all the treatments contains maximum amount of phenolic and flavonoid compounds when compared with the other two solvents used. Therefore, it has directly correlated with fly ash level in the soil till 60% treatment. The present investigation revealed that extracts obtained from *Calendula officinalis* grown in different fly ash-soil doses contain significant amount of phenolics and flavonoids. The outcome of these findings might be useful as a diagnostic tool for the evaluation of the antimicrobial activity of plant extracts.

SHM-137

Herbal Wine – A Healthy Drink

Puja Singh, Suresh Chandra, Samsher, Deepali Mudgal
Deptt. of Agricultural Engineering (Process and Food Engg.)
S.V. Patel University of Agriculture and Technology, Meerut (U.P)
E-mail: pujayadav5544@gmail.com

Before the revolution in medicinal area and rise of modern medicines, people were treated using the herbal formulations that were derived from plants. Herbal infusions are trendy in wine these days. Herbs used to prepare herbal wine are amla, tulsi, ginger, aloe-vera, peppermint etc mix with fruit juice like Wild Grapes, Guava, Sapota, Fig, Pomegranate, and blends of Guava with Kokum and Sapota. These herbs are either in powder form or completely dry form. Herbal wine has many health benefits like reduction in ovarian cancer, strengthening the bones and overall skeleton, cancer cells deteoriation, prevention of heart strokes by keeping the coronary arteries clean, elevating the lung functionality and also to lower down the hypertension and increase overall body performance. These herbs have anti-microbial, anti-cancerous properties. Different variety of herbs play a vital role in flavour enhancement and wine production. The herb used in herbal wine are having more tannins, polyphenols and lower titrable acidity. Herbal extracts have surplus esters and aldehydes making it nutritional and medicinal. Tannins found in the herbs are astringent in nature; they have aroma enhancing and antioxidant properties. They contain hydroxyl groups and carboxyl groups to form strong complexes with proteins. These are diverged to have polygamous roles like enhancers, preservatives and antioxidants. These antioxidants are found in flowers, fruits, stem, roots, and leaves. So such combinations of alcoholic drink with herbs give a novel product with better qualities, increased acceptability, wider applications and helpful in maintaining the health of human beings.

SHM-138

Ethnobotanical Study on the Flora of District Ambala Haryana: Part I

Raj Singh, Sushil Kumar Upadhyay, Indu Sharma, Sunita and Anil Kumar
Deptt. of Biotechnology, Maharishi Markandeshwar (Deemed to be University)
Mullana Ambala, Haryana

The presents study revealed the diversity of different plant species along with their vernacular names, habit and their occurrence in district Ambala of Haryana. This study is first of its kind conducted in the district showing current status of the plant diversity. During the floristic study 100 species belonging to 82 genera and 38 families have been described from the various sites in Ambala district, out of which 91 species were of ethnobotanical value. Out of total 38 families reported, 1 belongs to monocots and 37 to dicots. An analysis on the basis of habit revealed dominance of herbaceous flora (81species)

followed by shrubs (14 species) and climbers (5 species). Among all families , Asteraceae (16genera and 19 species each) is the more dominant families followed by Amaranthaceae (7 genera and 8 species), Poaceae (7 genera and 7 species), Malvaceae (5 genera and 6 species), Fabaceae and Solanaceae (4 genera and 5 species each) Euphorbiaceae (3 genera and 6 species each), Polygonaceae (3 genera and 4 species), Lamiaceae (3 genera and 3 species) Convalvulaceae (2 genera and 6 species), Cucurbitaceae Brassicaceae and Caryophyllaceae (2 genera and 2 species) and 25 families were represented by single genera and single species. This study suggested that documentation of traditional knowledge about plant medicinal uses provides raw material for pharmacological investigation and leading to discovery of various drugs. The study also acknowledges the ecological balance is being disturbed due to the activities of human population and their increased demand for more utilization of natural resources. Therefore, the proper knowledge of plant diversity could play important role in planning for conservation and sustainable use of available resources. This study is further carried out to explore the remaining flora of Ambala district and will be published in II part of investigation.

SHM-139

Improvement in Nutritional and Medicinal value of Mushroom *Pleurotus* sp. by using different Substrates

Rajeev Kumar, Rajat laller, Indu Sharma and Raj Singh
Deptt. of Biotechnology, Maharishi Markandeshwar Deemed to be University, Mullana, Ambala, 133207, Haryana, India
E-mail: rajeevkp1995@gmail.com

Pleurotus sp. (Oyster Musroom) is a very popular mushroom consumed all over the world due to their taste, flavor, high nutritional values and some medicinal properties. Several species of this genus are rich in proteins with essential amino acids, physiologically important polysaccharides and essential fatty acids, dietary fibers, important minerals, and some vitamins. Oyster mushroom contains 80-95% moisture, 3% protein 0.3 to 0.4% fat and 1% minerals and vitamins. Oyster mushroom having special types of vitamins, which is not destroyed by cooking, drying and freezing. Oyster mushroom is a good source of vitamin B such as Riboflavin (B2), Folate (B9), Thiamin (B1), Panthothenic acid (B5), and niacin etc. The chemicals present in this mushroom includes: polysaccharides, lipopolysaccharides, proteins, peptides, glycoproteins, nucleosides, triterpenoids, lectins, lipids and their derivatives. The study evaluated the performance of mushroom *Pleurotus* sp cultivation on different types of substrates supplemented with rice husk, wheat straw, coconut, corn cobs, waste cotton, banana leaves, *Psidium guojova, Eucalyptus, Azadirachta indica, Moringa oleifera* leaves are also used as substrate for addition of some nutritional and medicinal values in the oyster mushroom. It was observed that *Pleurotus* sp. was significantly affected by varying levels of supplementation. The high nutritional value and potential medicinal uses suggest that the *Pleurotus* sp. mushrooms are important functional foods or nutraceuticals.

SHM-140

Nutritional and Medicinal profile of White Button Mushroom cultivated in the State of Maharashtra, India

Satish Kumar Sinha, Tarun Kumar Upadhyay, Sushil Kumar Sharma, Manju Sharma
School of Agriculture, Suresh Gyan Vihar University, Jaipur, Rajasthan, 302017, India
E-mail: tarun_bioinfo@yahoo.co.in, tarun.kumar@mygyanvihar.com

This is susceptible change era and for India, which is country with large population, but limited land resource, it is a big challenge to meet the food demand. There is malnutrition and diseases in economically poor population and this makes the challenge even bigger. Therefore, necessity to discover any alternative food which has good nutritional values. Mushroom cultivation is such an alternative. Beside nutritional values, mushroom also has medicinal values. The composition of nutrients in white button mushroom was analyzed using standard methods. Following mean of the results was recorded for sample of fresh *A. bisporus* (white button mushroom). The nutrient composition unit was measured g/100g, Moisture 92.80±0.37, Ash 0.93.01±0.01, Protein 3.27±0.12, Carbohydrate 2.66±0.61, Fiber 1.87±0.08, Total fat 0.22±0.05, Energy K cal 28.50±1.22, Correlation between nutrients R^2 0.997 and Minerals content unit was measured mg/kg :Se 0.06±0.01,Ni 0.35±0.20,P 16.90±4.0,Mn 0.94±0.31, Fe 13.61±0.00, Na 3.65±0.70, Mg 78.96±9.76, Cu 2.26±0.27, Zn 3.65±0.13,Ca 26.58±7.95, K 3560±153.33, S 2195±1405 and correlation between minerals content (R^2=0.9701). Present investigation is to analyze the nutrients composition and medicinal profile of white button mushroom. Mushroom grows on wastes so it is non green revolution product. It does not require additional land. This solves land limitation issue. It has high nutrition properties. It also has high medicinal properties. Its fruit body has high significant nutrient and mineral composition. It may be used as source of food as well as medicine. The WBM additionally has properties like Antioxidantanti-inflammatory, bacterial, antifungal, anticancer, immunomodulatory, against atherosclerotic, Antidiabetic, Neuroprotective and HIV (Human immunodeficiency virus).

SHM-141

The study of antimicrobial activities of herbal extract of fennel seed, cardamom and Liquorice on *Candida albicans In vitro* condition

Umeshwar Narayan
Deptt. of Microbiology, C. C. S. University Meerut
E-mail: umeshwar1216@gmail.com

The herbal extract has been used as a medicine for treatment of microbial infection since ancient time fennel seed and cardamom are used as mouth fresheners and Liquorice as home remedies. but it has been seen that it affects the environment of oral cavity and reduce effect of oral microbial flora

concerned with oral cavity problem such as dental caries peritonitis and oral ulcer etc. In this study, *yeast C. albicans*, stored as stock pure culture, chosen due to its highest prevalence in oral cavity. Stock pure culture of *C. albicans* was used that were already diagnosed by microbiological techniques. Methods for herbal extraction were used Aqueous extract preparation and Ethanolic extract preparation methods. Herbal extract stocks were prepared in DMSO solvent. *C.albicans* was grown on SDA (Sabouraud's Dextrose Agar medium, I-Media) and inoculums density was prepared by Mc-Farland standard. Antifungal susceptibility was determined by Disc Diffusion, Broth Micro-dilution and Agar Well Diffusion method. Muller-Hinton agar medium was used for DD and WD Method. For this, herbal extract was used to examine their effect on test organisms which were dominantly found in oral cavity and have clinical importance. And in vitro report, were observed beneficial effect because It reduce number of viable count in BMD and inhibition zone were observed in well diffusion and Disc Diffusion Methods. As antibiotic have various adverse effect but traditional herbal therapy may have alternate beneficial therapy in above study.

SHM-142

Herbal Medicines, their Processing and Marketing

Urvashi Sharma and Dr. Shubha Dwivedi
Deptt. of Biotechnology, IIMT University, Meerut

"Nature itself is the best physician". This proverb defines the term "Herbal medicines". Herbal medicines are the plant –based medicines made from differing combination of plant parts e.g. leaves, flowers or roots. Each part can have different medicinal uses and the many types of chemical constituents require different extraction methods. Both fresh and dried plant matter are used, depending on the herb. Herbal medicine is suitable for people of any age. Herbal medicine has its beginning in ancient cultures. It involves the medicinal use of plants to treat disease and enhance general health and wellbeing. Some herbs have potent ingredients and should be taken with the same level of caution as pharmaceutical medications. According to world health organization (WHO), because of poverty and lack of access to modern medicine, herbal medicine is still the bastion of about 75-80% of the world population, mainly in the developing countries, for primary healthcare. This is primarily because of the general belief that herbal drugs are without concomitant besides being cheap and locally available. Herbal medicine was also an effective therapeutic method, but was viewed less anxious. Herbal medicine generally works towards to improve the overall health and wellbeing of an individual person or patient, not solely focusing on the primary adroit mechanism of a disease. The new legislation for traditional herbal medicinal products will come into force on 1st April 2011. Prominence has been placed on domestication, production and biotechnological studies and genetic improvement of medicinal plants. The trend towards the domestication and planting of medicinal plants instead of the use of wild harvested plants will offer great advantage, since it is possible to provide uniform and high quality raw material. The uniform quality of raw material is the first pivotal step in the process of developing good quality, herbal drugs, avoiding discombobulate, bastardize, defilement etc. The

process of acclimatize is the real and important possibility of improving the quality of raw material through genetic selection and breeding and the development of medicinal plants resistant to microorganisms- induced diseases, free of undesirable secondary metabolites, or rich in bioactive constituents. This paper focused on the recent development in the area of herbal medicines.

SHM-143

Qualitative Phytochemical Analysis of four Therapeutic Plant Species of Family Verbenaceae

Vishnu Shankar Sinha and Sushant Ram
P.G. Deptt. of Botany, Tata College, Chaibasa, Jharkhand, India 833202
E-mail: sram915@gmail.com; vish20nu@gmail.com

The present study reports the comparative Qualitative phytochemical analysis of four therapeutic plant species belonging to family Verbenaceae such as *Clerodendron infortunatum* Gaertn, *Lantana camara* L, *Tectona grandis* L.f. and *Vitex negundo* L. with special emphasis to quinine. All the plant species are commonly used for the treatment or mitigation of malaria or malaria like symptoms by the different tribes and rural people of Kolhan region of Jharkhand, India. (Ram, 2019). Fresh leaves of all Plant species were collected from Kolhan University, Chaibasa campus and Tata College, Chaibasa campus; plant leaves were air dried in shed for 3 to 4 days at room temperature and then it was kept in hot air oven at 40^0C for 30 min until all the water molecules evaporated and plant became well dried for grinding. Four types of solvent *i.e.* double distilled water (DDW), Ethanol, methanol and n-butanol were used for preparation of leaf extracts. Standard protocols (Ahmad and Beg 1998; Kassa et.al. 2014; Sofowra 1993 and Harborne 1973) were adopted for detection of major classes of phytochemicals. Quinine, Protein, Carbohydrate, Phenol, Tannin, Flavonoids, Saponins, Glycosides, Steroid and Alkaloids were detected in all of the plants tested while Terpenoids was only detected in *Clerodendron, Lantana, Tectona.* Interestingly, Qualitative detection of quinine was quite rich in *Vitex negundo* L than other plant species. Our results confirmed the therapeutic potential of tested plant species, hence Quantative phytochemical analysis, elucidate the molecular mechanism of action of phytochemicals be carried out as well as conserve this wealth of antimalarial plants species in the interest of mankind.

SHM-144

Review Editorial on Medicinal Value & Healthiness Reimbursement of Palash – *Butea monosperma*

Kaushal Kishor and Anoop Yadav
Deptt. of Agriculture G.S. Degree College, Allahabad State University, Prayagraj, Uttar Pradesh, India
E-mail: k.kishor023@gmail.com

The habitual organization of medicine together with folklore medicine continue to play a significant position in our physical condition care system. Palash is a frequently used herb in Ayurvedic medication. The botanical foundation of Palash is *Butea monosperma* Lam. Kuntze. It is a medium sized deciduous tree which is widely distributed throughout the superior part of India. The flowers look like fire and therefore considered as a form of Agnidev (God of Fire). Mostly found in the greater parts of India, and less found in the arid regions. It is known by different names according to the region or place in which it is found. Its gum is called as Bengal Kino or Butea Gum and is used for many purposes.

SAH-101

Production, Consumption and Marketed surplus of milk production in eastern region of India

Binita Kumari[1], B.S. Chandel[2], Tulika Kumari[3], Priyanka Lal[4]
[1]Assistant professor, RK (PG) College, Shamli-247776
[2]ICAR- National Dairy Research Institute, Karnal-132001
[3]Assistant professor, RPCAU, Pusa
E-mail: b.binitakumari@gmail.com

The present study was undertaken in the eastern region of India comprising of the states of Bihar, West Bengal and Jharkhand. A total sample of 300 households was selected according to probability proportional to size and production, consumption, marketed surplus of milk, factors affecting marketed surplus, utilization pattern of milk retained at home and disposal pattern of marketed surplus of the milk of the sample households was calculated. It was found that average daily milk production of the households in the region was 37.93 litres with an average consumption of 3.46 litres and the marketed surplus of 34.47 litres. On an average about 65 per cent of total milk retained for home consumption was converted into milk products while the remaining 35 per cent of it was consumed in liquid form. Among the different explanatory variables, herd size, price of milk, membership in dairy cooperatives and distance of household from collection centre had a positive and significant impact on marketed surplus of milk. The study also revealed more than 50 per cent of households disposed their milk

through halwais or dudhiyas, about 20 per cent is through cooperatives and about 25 per cent is disposed directly to consumers.

SAH-102

Effect of Helminth Parasites in Livestock Production

Desh Deepak
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110 (U.P.)
E-mail: deshdeepakmeerut@gmail.com

Helminth infections of cattle affect productivity in all classes of Livestock stocks, and are amongst the most important production-limiting diseases of grazing ruminants. The purpose of the study was to record and determine intensities, seasonal incidence and distribution of helminth parasites of veterinary importance that occur in cattle in Meerut. Cattle are parasitized by various helminth species, the most important being gastrointestinal nematodes (GIN), lungworms and liver fluke. These pathogens can cause severe disease, affect productivity in all classes of stock, and are amongst the most important production-limiting diseases of grazing ruminants. Essentially all herds/flocks in a grass-based production system are affected. Out of 8 faecal samples 6 were positive with helminthic eggs stool examination under low power microscope. (2- *Toxocara spp*, 2-*Amphistomum*, 2-*Haemonchus spp)*. Treated with Fenbendazole @ 5mg/kg and were found negative in stool examination after one-week post treatment.

SAH-103

Male dog contraception with Therapeutic Ultrasound

M. K. Shukla
Deptt. of Veterinary Gynaecology and Obstetrics
College of Veterinary and Animal Science, SVPUAT, Modipuram, Meerut (UP)
E-mail: shuklamanish15@gmail.com

A non-surgical form of contraception involving therapeutic ultrasound is a promising alternate to invasive procedure of orchiectomy and hence, the present study was conducted to validate it's utility in canine model. A total of 45 male dogs were divided into three equal groups of 15 dogs each. The dogs of Group I were subjected to three exposures of 1 MHz frequency and intensity of 1.5 W/cm^2 of therapeutic ultrasound all over the testicular surface for five minutes at 48-hr intervals whereas the animals in Group II were treated with similar frequency at the same interval at dorso-cranial surface of the testicles. The Control Group III was subjected to the same procedure as Group A, but with the

transducer switched-off. Though a significant decline in sperm concentration, motility, testicular volume and abnormal thermal/ questionable thermal profile was recorded in animals of group II at day 40 after treatment as compared to day 0, complete azoospermia was only recorded in animals of group I. The control animals (group III) did not exhibit any significant alteration in the recorded parameters. Azoospermia, testicular volume reduction and apparently irreversible testicular damage were achieved by Group I. Testosterone levels were at physiological range throughout the study (range 1.5–5.0 ng/dl) in all the groups with no significant difference between groups I, II and III. A regimen of three applications of ultrasound at 48 h interval at 1 MHz, and 1.5 W/cm^2 was effective as permanent sterilization in the dog without hormonal impact.

SAH-104

General Biosafety in Laboratory Procedures

Rajat Singh
College of Veterinary and Animal Science, SVPUAT, Modipuram, Meerut (UP)
E-mail: Rs94688@gmail.com

Microbiology laboratories are special, often unique, work environments that may pose special infectious disease risks to persons in or near them. Personnel have contracted infections in the laboratory during their work tenures. Published reports around the turn of the century described laboratory-associated cases of typhoid, cholera, glanders, brucellosis, and tetanus and many more.

Four biosafety levels are described for activities involving infectious disease activities with experimental mammals. These four combinations of practices, safety equipment, and facilities are designated *Animal Biosafety Levels* 1, 2, 3, and 4 and provide increasing levels of protection to personnel and the environment. Standard general microbiological practices: a) Access to the laboratory is limited or restricted at the discretion of the laboratory director when experiments are in progress. b) Work surfaces are decontaminated once a day and after any spill of viable material. c) All contaminated liquid or solid wastes are decontaminated before disposal. d) Mechanical pipetting devices are used; mouth pipetting is prohibited. e) Eating, drinking, smoking, and applying cosmetics are not permitted in the work area. Food may be stored in cabinets or refrigerators designated and used for this purpose only. Food storage cabinets or refrigerators should be located outside of the work area. f) Persons wash their hands after they handle viable materials and animals and before leaving the laboratory. g) All procedures are performed carefully to minimize the creation of aerosols. h) It is recommended that laboratory coats, gowns, or uniforms be worn to prevent contamination or soiling of street clothes. The most important element of containment is strict adherence to standard microbiological practices and techniques. Persons working with infectious agents or infected materials must be aware of potential hazards and must be trained and proficient in the practices and techniques required for safely handling such material. The director or person in charge of the laboratory is responsible for providing or arranging for appropriate training of personnel.

SAH-105

Camel Milk - A Source of Potential Probiotic Strains

Komalben Hirani [1], Amar Garg [2] and Sandeep Shrivastava [3]

[1,2] Shobhit Institute of Engineering & Technology (Deemed to be University), Modipuram, Meerut,
[3]Associate Professor& Head (CIRD), Dr. B. Lal Clinical Lab Pvt. Ltd. & Dr. B. Lal Institute of Biotechnology, Jaipur, Rajasthan, 302017, India

E-mail: komalhirani2008@gmail.com

Use of probiotics is evidently on a high rise due to its various health benefits. Probiotics are live microorganisms promoted with claims that they provide health benefits when consumed, generally by improving or restoring the gut flora. These live microorganisms are generally Lactic Acid Bacteria. Large number of probiotics sold in the market at high cost are usually found ineffective due to its limited health benefits and several other limitations. Therefore, demand of novel probiotics is the necessity of time. Several studies in the past have demonstrated the use of cow, buffalo and sheep milk as probiotic, but very limited studies on camel milk are available till date. Camel is the only cattle which can survive in both the extreme summers as well as winters with very little consumption of water. The milk produced by camel is believed to be highly nutritious with various health benefits. The primary objective of our present study is to determine the probiotic potentials of Lactic Acid Bacteria isolated from camel milk. Our study found that camel milk is the great source of Lactic Acid Bacteria isolation. About 27 isolates from 14 different camel milk samples were isolated. On biochemical characterization, these isolates were found to be from 3 different genera that is *Lactobacillus, Lactococcus* and *Pediococcus*. All the isolates were checked for their growth at low pH, different bile salts concentration and growth at different temperatures. The isolates which fulfilled these criteria's were further checked for its antagonistic activity against common human pathogens as well as their potential to resist against antibiotics. Our study found best two isolates which were identified as *Lactobacillus fermentum* and *Lactobacillus acidophilus* on the basis of Bergey's Manual of Systematic Biology. The entire work will briefly explain the biochemical characterization of potentially probiotic strains of Lactic Acid Bacteria isolated from camel milk.

SAH-106

Influence of Fenugreek Seed Powder and Vitamin E on Growth Performance and Feed Conversion Efficiency

Shiwanshu Tiwari[1,2], D.S. Sahu[1], C.B. Singh[2], Manoj Bansala[1], Pawan yadav[1] and Kartik Tomar[1]
[1] Deptt. of Animal Husbandry, College of Agriculture, SVPUA&T, 250110 Meerut, U.P.
[2] Deptt. of Animal Genetics and Breeding, College of Vet. and animal sciences, GBPUA&T,
E-mail: shiwanshutiwaridiscover@gmail.com

An experiment was conducted on 120-day old broiler chicks (cobb-400 strain) reared in deep litter system at PRTC of SVPUA&T Meerut during 2016-17 to study the effect of fenugreek seed powder & Vitamin E on performance of broiler chicks. The chicks were randomly divided in to 4 treatment groups (T_1, T_2, T_3 & T_4) of 30 chicks each group having 3 replications consisting of 10 broiler chicks each. The control group (T_1) was feed diet without fenugreek seed powder and Vitamin E and group T_2, T_3 and T_4 were supplemented with fenugreek seed powder in basal feed @ 02g/Kg of feed in T_2, basal diet + vita. E @ 50mg/Kg of feed in $T_3$and basal diet + fenugreek seed powder 2g/Kg + Vita. E @ 50mg/Kg of feed in T_4. The average BWG was found 1947.57±0.62, 2094.900±1.28, 2110.03±0.73 and 2186.43±0.53 g at 6 weeks of age in T_1, T_2, T_3 and T_4 group, respectively. The average Feed Conversion Efficiency (F.C.E.) up to 6 weeks of age ranged from 1.65±0.00 (T4 group) to 1.76±0.00 (T1 group). The F.C.E. up to 6 weeks of broiler chicks of all the treatment groups differ significantly ($P<0.05$) to each other. The results of an experiment on growth parameters and F.C.E. of broiler chicks indicated that dietary inclusion of fenugreek seed powder and Vita. E combination could be affectively use in the ration of broiler chicks to improve the performance. The optimum level adjusted from present study are 2gm/Kg Fenugreek seed powder and 50 mg/Kg Vita. E consideration.

SAH-107

Zinc flow in indigenous sheep reared under low input semi-arid region of Telangana

Venkata Raju N[1], P.K. Pankaj[2], Busetty. Manasa[3], Abhinav Parashar[4].
[1,3,4] Vignan's Foundation for Science, Technology & Research, Vadlamudi, Guntur, A.P.
[2]Senior Scientist (Livestock Production Management), ICAR-CRIDA, Hyderabad.
E-mail: venkat.raju005@gmail.com

In semi-arid regions of Telangana having predominant population of sheep, small ruminants mainly graze on the native grasses, crop residues and agricultural by-products due to which mineral deficiencies are very rampant in these areas. Present investigation was carried out to observe Zinc (Zn) flow in low to medium rainfall (around 750 mm) areas, Gaddamallaya Guda in Ranga Reddy district and Gangupally in Vikarabad district of Telangana, India and suggest suitable measures to prevent its losses as well as alleviate Zn deficiency in sheep. Ten farmers from each village rearing Nellore breed of sheep

(five sheep from each farmer making a total of 50 sheep) were randomly selected for collection of samples (soil and plant from grazing areas; blood, faecal and urine samples from animals). Zn content were analyzed with the help of an atomic absorption spectrophotometer after suitable processing of samples. It was observed that the 37-48 % of soil samples and most of the straws and stovers of the study area were classified as below critical level for Zn. Green fodder (Hybrid Napier Co-4 variety, fodder sorghum, grazing grass), tree leaves and concentrate ingredients were having sufficient Zn content. The Zn content in the samples of Nellore sheep were inadequate, where 32.2-47.3% of the samples were having below critical level of Zn which suggests sizable amount of indigenous sheep suffering from Zn deficiency. Significant correlation values were obtained between feed and fodder and sheep serum, however, such correlations were not observed between the mineral levels in sheep serum and mineral levels in soil. Zn content in green fodder were more representative of soil, faeces and urine (R^2=0.467) than only soil (R^2=0.123) which suggests true recycling of nutrients through faeces and urine under rural semi-arid conditions. Based on soil, forage, feed, water and animal samples analyses, it was concluded that almost most samples were deficient in Zn, but animal was able to maintain the plasma Zn level to some extent (62.4%). Zinc homeostasis is largely regulated by its uptake and loss through the small intestine. Supplementation of Zn is required to overcome sub-clinical Zn deficiency mainly through feed fortification and supplementing the feed with Zn rich components.

SAH-108

Clinico-pathological study *of Lantana camara* toxicity in a sheep farm

Rakesh Kumar Gupta[1], D Niyogi[1], R N Yadav[2], S V Singh[2], A Mishra[1] and V K Varun[3]
[1] Deptt. of Veterinary Pathology, C.V. Sc & A.H, ANDUAT, Kumarganj, Ayodhya, UP
[2] Deptt. of Veterinary Medicine, C.V. Sc & A.H, ANDUAT, Kumarganj, Ayodhya, UP
[3] Deptt. of Veterinary Clinical Complex, COVAS, SVPUAT, Meerut, UP
E-mail: rakeshguptaa96@gmail.com

Lantana camara is an exotic weed brought to India as an ornamental plant but become toxic weed in most parts of the country. This plant is not readily eaten by sheep but when ingested leads to hepatotoxicity and photosensitization. To study clinic-pathological changes in sheep due to Lantana camara poisoning. A farmer village khandasa, Kumarganj in September, 2018 reported 5 mortalities in a flock of 30 sheep to the Veterinary Clinical Complex, ANDUAT, Kumarganj, Ayodhya, and brought one dead sheep for post-mortem examination. The farm was visited and on the basis of grazing area, grazing history and clinical signs, toxicity of *Lantana camara* was suspected and was confirmed by postmortem examination. During farm visit, numerous lantana shrubs were found near farm. The incidence and mortality rate was 43.33% and 16.66% respectively. The affected sheep showed discharge from eyes (conjunctivitis), anorexia, dehydration and ruminal stasis. Oedema of oral mucosa, lips and ear were also observed. There was loss of hairs and sloughing of skin around ear, muzzle, eye and tail which are suggestive of photosensitization. The postmortem examination showed liver as enlarged, fragile and pale yellow. Gall bladder was swollen with dark and viscous contents. Kidney was

pale and swollen. *Lantana camara* has become a wild pest in many parts of Eastern Uttar Pradesh of India. Incidence of lantana poisoning varies from sporadic to heavy outbreaks during drought or flood condition when fodders is in scarce and are responsible for mortality and production. Preventing the spread of lantana is the most effective management tool.

SAH-109

Treatment of Ruminal Impaction of Cows Using Traditional Indian Food Oils

Riteshkumar Arya[1], Amar Garg[2], Komal Hirani[2], Vimal Sharma[3]
[1]School of Life Sciences, Jaipur National University, Jaipur, Rajasthan, India.
[2] Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut, U.P, India.
[3]Undergraduate Student, School of Agriculture Sciences, Jaipur National University, Jaipur, India

Rumen impaction is a severe condition of cattle which is caused due to accumulation of indigestible materials (*e.g.* plastic waste) in the rumen. Such medical complications in the stray animals of developing country like India are very common. The animals including cows have several beneficial uses and religious beliefs in Indian population. But these animals die because of "Ruminal Impaction". According to the literatures, it is enumerated that about 3000 animals every year in India loses their lives due to Ruminal Impaction. Cow is considered as mother according to Hindu mythology but they die a cruel death due to ingestion of plastic waste. The main objective of our present study is to cure Ruminal Impaction using traditional Indian food oils. The study was conducted on 7 different cows suffering from severe ruminal impaction. An innovative liquid syrup was prepared using a cocktail oil obtained from mustard, sesame seeds, castor oil, *Azadirachta indica* seeds and alum, sago and rock salt which were blended in cow buttermilk and was given to infected cows as a tonic for four regular days with their routine diet. All the plastic waste which was ingested by the cows, was vomited out through their mouth. Out of 7 cows, five were out of danger and are living a health life whereas 2 cows died due to ruminal impaction. The entire study will highlight the innovative treatment of ruminal impaction of cows. Further experiments are in process on large scale.

SAH-110

Beneficial Effects of Probiotics from Dairy Products

Swati Sharma and A.P. Garg
School of Biological Engineering & Life Sciences, Shobhit Institute of Eng. & Tech., Meerut

Probiotics are "live microorganisms which, when administered in adequate amounts, confer a health benefit on the host". Probiotics include lactic acid bacteria such as *Lactobacillus* and *Bifidobacterium*. These strains are widely used as the fermentation of dairy products such as yogurt, cheese and kefir.

Probiotic containing milk products are beneficial for a number of gastrointestinal, digestive conditions, diarrhea, respiratory tract infections, alleviation of symptoms of lactose intolerance, binding of toxins. The role of balanced nutrition for health maintenance has attracted the attention of the scientific community, which in turn has produced numerous studies in order to prove the performance of certain foods in reducing the risk of some diseases. There has also been considerable growing interest in encouraging research into new natural components. The metabolic capacity of gut bacteria is extremely diverse. This diversity is influenced by the large number of bacterial genera and species.

SAH-111

Preparation of Formalin free and Air dried Anatomical Specimens

***Yousuf Dar, Prabhakar Kumar, Prashant Gedam and Aditya* Kumar**
Deptt. of Veterinary Anatomy,
College of Veterinary and Animal Science, SVPUAT, Meerut, 250110, UP, INDIA
E-mail: yousufdar8@gmail.com

Dry preservation is an alternative technique to conventional formalin preservation. Plastination though well known for its preservation qualities of anatomical specimens is still more costly. So the aim of our present study was to develop a formalin free and air dry preservation of anatomical specimens of goat. The fresh samples of heart, lungs were collected and subjected to acetone-chloroform-melamine protocol. The dried specimens were economical, easy to handle and free from noxious formalin fumes. The specimens can be stored in open space without any preservatives and can be handled comfortably by both students and teachers as it avoids the ill effect of formalin like irritation to eyes, nose and respiratory tract.

SHE-101

Feasibility study of ash generated from waste-to-energy (WTE) plants to develop value - added building materials

***Afeefa Ateeq*[1], *Amar P. Garg*[1] & *Niraj Jain*[2]**
[1] Shobhit Institute of Engineering and Technology, Meerut.
[2] Principal Scientist, CSIR-CBRI, IIT Roorkee.
E-mail: afifaatiq6@gmail.com

The environmental problem arising from unscientific and indiscriminate disposal of Municipal solid waste (MSW) is a real means for the whole society. In addition to the MSW, urban areas in Delhi generated various other wastes such as ash from waste to energy plants, sludge from ETP plants and silt from drains. These waste get mixed up with MSW at collection or disposal points leading to many problems in waste processing plants such as composting, waste to energy etc. These wastes are either

disposed in all landfill sites which are already overburdened and saturated or in dumpsites/water bodies/low lying areas in the city. The importance of utilization of industrial waste used in building sector as ecofriendly building material is widely recognized and reflected by increasing emphasis being placed to reduce pollution and health hazards produced by them. The waste-to-energy (WTE) ashes - an inert material which was previously thought of non-usable and land filling was the only option for its disposal. But now it has been proved that it could be utilized completely with the help of proper studies for development of eco-friendly building materials. The present investigations deal with utilization of ashes generated from WTE plants to develop Value Added Building Materials. These WTE plants are processing the dry MSW for power generation. Studies on feasibility has been carried out using WTE ashes viz. fly ash and bottom ash as partial replacement of fine aggregate to develop construction materials like road paving blocks. OPC cement was used as binding materials in all the studies. After initial studies using these ashes as fine aggregates it was observed that that results are encouraging and giving high compressive strength required to develop the products.

SGB-101

Marker Assisted Background Breeding – Potential tool for development of CMS lines in *Capsicum annum* in less time

Anita Verma and Alpana Joshi
Deptt. of Agriculture and Agri Informatics
Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut
E-mail: anita5786verma@gmail.com

The pepper seed industry in India has a total value of 70M$. CGMS system not only helps in reducing the cost of hybrid seed production but also improves genetic purity of hybrid seed. In addition, it also helps private companies in securing their germplasm from theft. To develop a new sterile line backcross is the only method as self cannot be produced by Sterile line. Marker Assisted Backcrossing (MABC) can help in reducing the time required to develop an isogenic line by 40-50% when compared to conventional backcrossing. A significant amount of work has been done in transferring the required gene from one parent to another and increasing the efficiency of MABC by either increasing the population in backcross generation, but there is no report of development of sterile line using marker assisted backcrossing is available. For the development of new sterile lines, foreground marker is not required as the maintainer crossed with CMS line will always give sterile generation. So directly background markers can be run on BC1/BC2/BC3 generation. For the selection of background markers public database can be utilized. Recently the whole genome of the *C. annuum*, its wild progenitor *C. annuum* var. *glabriusculum* and *C. baccatum* has been sequenced. Moreover, there is availability of many inter- and intra-specific genetic maps with wide distribution of markers covering the whole genome. Thus, with defined protocol and wise selection of donor, markers and population size there is

wide scope in reducing the cost of MABC and making it economically feasible for commercial application.

SGB-102

Sequence diversity of the *Sub1A, Sub1B* and *Sub1C* genes among rice genotypes and its association with flooding tolerance

Anuradha Singh[1,2,3], Yashi Singh[1], Ajay K Mahto[1], Renu Singh[1], Neera Yadav[1], A.K. Singh[5], Endang M. Septiningsih[2,4], H. S. Balyan[3], Nagendra K. Singh[1] and Vandna Rai[1]

[1]ICAR-National Institute for Plant Biotechnology, Pusa Campus, New Delhi, India
[2]International Rice Research Institute, DAPO 7777, Metro Manila, Philippines
[3]Chaudhary Charan Singh University, Meerut, India
[4] Deptt. of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843, USA
[5] Deptt. of Crop Physiology, NDUAT, Faizabad, UP, India

Erratic rainfall leading to flooding stress causes huge yield losses in rice. The traditional varieties and landraces of rice germplasm possess variable levels of tolerance to submergence stress, but gene discovery and utilization of these resources have been limited to the *SUB1A-1* allele of FR13A rice variety. Therefore, we studied the allelic sequence diversity of the three SUB1 genes (*SUB1A*, *SUB1B* and *SUB1C*) in a panel of 179 rice genotypes and its association with submergence tolerance. Population structure analysis on a 36-plex genome-wide genic-SNP assay grouped them into two major categories representing *Indica* and *Japonica* with further sub-groupings for each into *indica*, *aus* and *deepwater* and *aromatic* and *japonica*, respectively. Flood tolerant genotypes identified belonged to *aus* and *deepwater* groups. *SUB1A*, *SUB1B* and *SUB1C* genes located in tandem on chromosome 9 were PCR-amplified and re-sequenced using IonTorrent PGM platform revealing diverse haplotypes and the phylogenic relationship among the three genes. Germplasms not having Sub1A-1 gene showed different level of reponse towards submergence stress. Some germplasm also having the Sub1 A-1 allele showed a varied level of response towards submergence which suggested that there can be other genetic factors independent of the Sub1A-1 gene, for flooding tolerance.

SGB-103

Morphological Characterization and Yield Traits Analysis in Some Parental Crosses of Okra (*Abelmoschus Esculentus* L.)

Arvind Kumar[1], Tanu Shiri[1], S.S. Gaurav[1], Sahadev Singh[1] and Mahendra Kumar[2]
[1] Deptt. of Genetics and Plant Breeding, CCSU campus Meerut, Uttar Pradesh
[2] Deptt. of Genetics and Plant Breeding, CSSS (PG) College Machhara, Meerut, Uttar Pradesh
E-mail: chaurasia.gpb@gmail.com

Okra (*Abelmoschus esculentus* L.) is a fruit vegetable annual crop believed to originate from Southeastern Asia. The okra improvement program highly depends on the significance of genetic combining variability and genetic advance, various character association, direct and indirect effects on harvest and high production attributes. Genetic diversity is the total number of genetic characteristics in the genetic makeup of a species important for different selection of parents to progeny recovers transgressive offspring. The magnitude of phenotypic coefficient of variation (PCV) was higher than that of Genotypic coefficient of variation (GCV) for all the traits. The PCV and GCV were very close for most of the characters which shown fewer natural effects on the expression of the characters under this analysis. High values of PCV with compatibly to GCV were observed for the characters because the number of main branches and number of fruits per plant which indicated the presence of considerable variability for these characters thus suggesting good scope for improvement of yield through selection. High magnitude of heritability coupled with high genetic advance for the characters because leaf axil bearing first fruit, first flowering. Plant height, duration, yield per plant, number of pods per plant, number of seeds per pod, number of primary branches, fruit weight and fruit length suggested the scope for improvement of these characters through selection. Heritability coupled increases with moderate genetic advance for days to fruit length and fruit diameter revealed that direct selection has limited scope for further improving these traits. In this Study direction are very less and can not to be generalized for every environmental condition and with other genetic materials.

SGB-104

Variability, Heritability and Genetic Advance for Yield and Yield Related Traits in tomato (*Lycopersicon esculentum* Mill.)

Vipin Kumar, Taru Dumi, Arvind Kumar, M.K. Singh, Sunil Malik and Mukesh Kumar
College of Horticulture, S.V.P. University of Agriculture & Technology, Meerut (UP), India
E-mail: vipinch1@yahoo.co.in

The present investigation was conducted at Horticulture Research Centre, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut (UP) 250110 during *rabi* season in 2018-19. The

study was undertaken with 36 genotypes of tomato in the randomized block design and revealed significant difference for all the 10 characters, this indicated the presence of wide spectrum of variability among the genotypes. The phenotypic coefficient of variation (PCV) was higher than the respective genotypic coefficient of variation (GCV) for all the traits, a narrow difference between PCV and GCV were recorded for most of the traits except for days to 50% flowering and number of branches. High heritability and genetic advance as per cent of mean were observed for all ten characters. The highest heritability was recorded in number of fruits per plant and lowest for number of branches.

SGB-105

Genetic Variability studies in Gladiolus (*Gladiolus hybridus* Hort.)

Manoj Nazir
Directorate of Agriculture, Krishi Bhawan, Talab Tillo, Jammu
E-mail: manojnazir@rediffmail.com

Genetic variability studies in gladiolus was carried out among 22 diverse genotypes of gladiolus for 20 characters at R.F. (Floriculture) Jammu for two years during 2010-2011 viz., American Beauty, Appache, Bonos Memory, Black Beauty, Congosong Canidman, Day Dream, Enchantress, Friendship, Great Britan, Her Majesty, Jester Gold, Lucky Number, Oscar, Pb. Morning, Red Beauty, Trader Horn, White Friendship, White Prosperity, Wine & Roses, Pacifica, Wind Song, Congo Song, Black Beauty. The PCV were higher than GCV for all the character's studies, indicating thereby high degree of environmental influence. Higher GCV and PCV estimates were found for number of cormels per plant and average weight of cormels per plant. Hertiablity estimates were high (>80%) for days to 50% heading, days to first floret opening, days to last floret opening. Whereas, Propagation Coefficient, number of cormels per plant showed moderate to high heritability along with genetic advance showing additive gene effects.

SGB-106

Effects of Gamma Radiation in Brinjal (*Solanum Melongena*) Seeds

Vrishti Kumari[1] and V K Prabhat[2]
[1]P G Deptt. of Botany, Gaya college Gaya (Bihar) India.
[2]P G Deptt. of Botany, Dr A H Rizvi College, Karari, Kaushambi, U. P.

The present paper deals with effects of gamma radiation in brinjal seeds. Brinjal is one of the most labor and cost intensive horticultural crop in the World. It is also one of the most consumed vegetable. Its high volume consumed guarantees the importance as supplier of potash, folic acid, vitamins A, B1, B2, B3, C and E [1, 2]. Five treatments radiation doses were applied as follows: 0 (control); 10kr,15kr,20kr

25kr and 30kr. Seed germination as well as green fruits number, harvested fruit number, fruit weight and total production were assessed to identify occurrence of stimulation. Tomato seeds and plants were handled as for usual Brinjal production in Deptt.al garden. Low doses of gamma radiation treatment in the seeds stimulate germination and substantially increase fruit number and total production up to 86% at 15 Kr dose. There are evidences that the use of low doses of gamma radiation can stimulate germination and plant production thus, showing hermetic effects.

SGB-107

Comparative Study of Two Rice Germplasm against Drought

Shivani and Mohd Vaseem
Shobhit University, Gangoh

Rice (*Oryza sativa* L.) is a high-energy food but low quantity of protein as compared to wheat. Rice was first cultivated crop in India. The optimum temperature for rice cultivation is between 25°C and 35°C, and in temperate regions, rice growth is impressed by limited period that favors its growth. Rice crop need a hot and humid climate. It is most suitable to regions having, high humidity, prolonged sunshine and an assure supply of water. In this study, two rice germplasm *i.e.* Nagina-22 and shusk samrat were use for screening of drought stress tolerance at PCR of gene expression level. Nagina-22 and sushk samrat are highly drought tolerant germplasm of rice. DREB1A SSR marker is a Transcriptional activator that binds specifically to the DNA sequence 5'-[AG]CCGAC-3'. Binding to the C-repeat/DRE element mediates drought-inducible transcription. DREB1A factors play a key role in drought tolerance. As Result, expression of OsDREB1A gene which is associated with induces of drought tolerance genes was found to be induced strongly in Nagina-22 genotype and this genotype also is documented for possessing unique gene allele with DREB1A SSR marker.

SPP-101

Phytochemicals constituents of *Calotropis procera* and their efficacy in bio-control against cotton mealy bug (*Phenacoccous solonopsis*)

Devendra Kumar[1], Dhan Prakash[2], Veena Aagrawal[3], Suresh Nebapure[4] and Tanu Jindal[1]
[1]Amity Institute of Environmental Toxicology, Safety and Management,
[2]AIHRS, Amity University-UP, Sector-125, Noida-201313 India.
[3]Dept of Botany, University of Delhi, New Delhi.
[4]Division of Entomology, Indian Agriculture Research institute, PUSA, New Delhi.
E-mail: devendranagar14@gamil.com

Calotropis procera is a weed plant known for its high medicinal properties. Screening and bio-efficacy studies of extract of *C. procera* against cotton mealy bug (*P. solonopsis*) and identification of its active

phytochemical constituents. Plant materials was collected, cleaned, shade dried and grounded. 100 g of powder was extracted with 300 ml methanol thrice at room temperature. The solvent from combined extract was removed under reduced pressure in rota-vapor at 50-60^{O}C. The crude extract was further fractionated with different solvents and studied for antioxidant and insecticidal activities against selected insects and chemical composition. Total phenolic contents were ranging from 25.6 to 39.4 mg/g gallic acid equivalent (GAE), antioxidant 45.6 to 67.4% and free radical scavenging activity by using DPPH (1,1-diphenyl-2 picrylhydrazyl) varied from 35.8 to 39.6 %. The crude extract showed potential insecticidal efficacy against experimental pest at 16.7% at 0.007 % lowest dose and 63.3% at 0.5% highest dose. Further, hexane soluble fraction showed highest (66.7%) at 0.5% and chloroform fraction showed highest (66.7%) mortality at 0.5% dose as bio-control against cotton mealy bug. The LD_{50} and LD_{90} data obtained for crude extract 0.080 and 9.411 % at fiducial limits of 0.026 to 0.485 and 1.027 to 18.15 respectively. The extracts and different fractions were subject to LC-MS-MS analysis to identify its phytochemical constituents and activity guided fractionation. The data showed the presence of dehydrositosterol acitate, calotropin, daucosterol, sitosterol, calotoxin, uscharidin, lupeol dihydocinnamate, rutin hydrate, stigmastanol ferulate, cardenolide card, sitosterol-monohydrate, and beta –sitosteryl ferulate, Phenols were phenolic acids, anthocyanins, rutin and their derivatives. *Calotropis procera* a weed available in abundance was found with promising bio-active constituents and insecticidal activity.

SPP-102

Antimicrobial activity of Lantana (*Lantana camera)* and Neem (*Azadirachta indica*) to Control the Plant Diseases

DilKunwar, Neha Jha, Kalpana, Manisha Sharma, Indu Sharma, Raj Singh
Deptt. of Biotechnology, Maharishi Markandeshwar Deemed to be University, Mullana, Ambala, 133207, Haryana, India
E-mail: 19951029dil@gmail.com

Indian economy is dependent upon agriculture, mostly fungi cause serious damage in agriculture crop production, quality and profit. Now a day's agriculture has made remarkable progress during last decades and part of this progress has been the development of modern methods of plant disease control. Lantana (*Lantana camera)* and Neem (*Azadirachta indica*) are medicinal plant which are effective against plant diseases. We isolated the five fungal pathogens from infected plants like brassica leaves, bottle guard and lemon and orange, which was further morphologically and microscopically identified by standard manual. Isolated fungi are *Aspergillus, flavus, Aspergillus fumigatus, Mucor* and *Rhizopus*. In present studies Lantana and Neem leaves extract showed prominent antifungal activity against plant pathogenic fungi. The results show that different solvents (methanol, hexane and water) having different spectra of antifungal activity against *Aspergillus niger, Aspergillus fumigatus, Mucor* and *Rhizopus* fungal plant pathogen. Fungal growth inhibition was maximum 50% in *Mucor* and 68% in *Rhizopus* and minimum inhibition was observed in hexene 31% in *Aspergillus* and 20% in *Rhizopus.* The

experiment confirmed the efficacy of some selected plant extracts as natural antimicrobials and suggested the possibility of employing for disease control.

SPP-103

Ecofriendly Management of Plant Disease by Selected Plant extract

Indu Sharma, Parvinder Devi, Poonam Devi, Mukesh Kumar and Raj Singh
Deptt. of Biotechnology, Maharishi Markandeshwar Deemed to be University, Mullana, Ambala, 133207, Haryana, India
E-mail: endusharma@gmail.com

The use of chemical pesticides for controlling various plant diseases is still a common practice especially in developing countries. Although with the application of chemical fungicides, plant diseases can be controlled but the hazardous impacts of such products in human health and environment are well known. Natural plant products have been found effective ecofriendly management of plant disease and could be safely incorporated as suitable alternatives for synthetic fungicides. Neem (*Azadirachta indica*), Eucalyptus (*Eucalyptus globules*) Lantana (*Lantana camera)* and Castor (*Ricinus communis*) are medicinal plants which have various applications against plant diseases. These extracts or botanicals have a bright future in modern plant protection to replace conventional synthetic pesticides. In present studies we isolated the four fungal pathogens from infected plants like paddy straw, bottle guard and lemon and orange, which was further morphologically and microscopically identified. Neem, Eucalyptus, Lantana and Castor leaves extract showed prominent antifungal activity against *Aspergilllus flavus, Aspergillus niger, Rhizopus* and *Mucor* fungus. The results shows that extract of leaves in different solvents (Methanol, Hexane and water) having different spectra of antifungal activity against fungal plant pathogen. Through this study we developed bio-fungicides, which are used to control the activity of plant pathogenic fungi. The present study is successful in demonstrating inhibitory activity of important medicinal plants against phytopathogenic fungi and proposes the use of these plants in plant disease management. The bio-fungicides explores as bio-control agent has contributed to substantial increase in crop production.

SPP-104

Biological Control of Fusarium Wilt of Tomato (*Lycopersicum esculentum Mill*.) by Phenotypic Volatile and Non Volatile Inhibitory compounds of Rhizospheric Antagonistic Organisms

Rashmi Nigam[1] and Joginder Singh[2]
[1] Deptt. of Plant Pathology, J. V. College, Baraut, UP
[2] Deptt. of Horticulture, J. V. College, Baraut, UP
E-mail: rashminigampatho16@gmail.com

A total of 20 rhizosphere microbes were isolated from healthy rhizosphere soil samples of tomato collected from major tomato growing areas of Uttar Pradesh. Out of which (eight fungal antagonists, ten bacterial antagonists and two fluorescent Pseudomonads) were found to exhibit antagonism against tomato wilt pathogen. Rhizospheric antagonists can act as potential biocontrol agents, showing antagonistic activity against phytopathogen by production of volatile and non-volatile metabolites. In vitro assessments revealed their antibiosis and mycoparasitic ability to affect growth pathogen *Fusarium oxysporum* due to production of toxic volatile and non-volatile metabolites. On further in vitro evaluation, nine isolates including four fungi, four bacteria and one pseudomonas sp. were found to be most efficient against tomato wilt pathogen. Among them four promising antagonists were tested RFA 2 showed the highest mycelial inhibition of the pathogen (24.35% and 74.5%) followed by RFA 4(17.29% and 60.47%) and RFA 1 (5.17% and 31.76%), whereas RFA 3 showed less inhibitory effect (2.35% and 22%) by production of volatile and non-volatile inhibitory compounds respectively after seven days of inoculation. Those rhizosphereic bacterial antagonists (RBA1, RBA 2, RBA 3 and RBA 4) and rhizospheric fluorescent pseudomonads (RFP1) which were found to be extremely efficient against Fusarium wilt pathogen of tomato in dual culture were further phenotypically identified based on the production of Siderophores, HCN and ammonia. Among them fluorescent Pseudomonads RFP 1 was positive to siderophore, HCN and ammonia production.

SPP-105

Differential physiological and antioxidant defense responses of seven oilseed *Brassica* species to Alternaria blight infection

Geeta Devi[1], R. P. Awasthi[2], A. K. Tiwari[2] and Arvind Kumar[3]
[1]RK (PG) College, Shamli-247776
[2] Deptt. of Plant Pathology, College of Agriculture, GBPUA&T, Pantnagar - 263 145
[3]Central Soil Salinity Research institute, Karnal-132001
E-mail: ujjwal2810@gmail.com

Oilseed crops play an important role in global agriculture and horticulture. *Brassica* species group of crops is the major oilseed crop of India; this contributes about 23% acreage and over 25 % production for the last five years. This crop has low average productivity due to the prevalence of various biotic and abiotic stresses. Among the various factors limiting their productivity. Alternaria blight caused by *Alternaria brassicae* (Berk.) Sacc., is an important and a widespread destructive disease of rapeseed-mustard worldwide. This disease infects host species at all growth stages from seed germination to ripening of siliquae and deteriorate both quality and quantity of oil. The capability of physiological traits as indicators for identifying tolerant genotypes in rapeseed- mustard would be used as tools in the form of validated stress-tolerance to accelerate breeding associated with *Alternaria* blight resistance. A set of representative eight oilseed *Brassica* species (*B. Brassica juncea -domo yellow, B. rapa, B. napus-PB9501, B. carinata-turnip red, B. nigra-local, Eurca sativa, B. alba*) evaluated in the field experiments using a Randomized Block Design (RBD) with two replications under control and infected with *Alternaria brassicae*. The photosynthetic rate, stomatal conductance, transpiration rate, intercellular CO_2, carotenoids, chlorophyll content, total phenol content, total protein content and antioxidant enzymes participating in the scavenging of ROS were investigated. Chlorophyll content was significantly reduced in infected plants after 2 weeks of infection as compared to control plants. Decreased net photosynthetic rate, transpiration and stomatal conductance, and a slightly higher intercellular CO2 concentration were observed in infected plants. The results also revealed an increase in Superoxide dismutase (SOD) and peroxidase (POD), Phenyl Ammonia Lyase (PAL) and catalase activities in infected leaves of different genotypes of rapeseed-mustard.

SPP-106

Immunological assessment of nematode-bacterium complex in Agriculture Insect Pest Management

Istkhar[1] and Ashok Kumar Chaubey[2]
[1] Deptt. of Bioscience and Biotechnology, Banasthali Vidyapith, Banasthali-304022, Rajasthan,
[2]Nematology Laboratory Deptt. of Zoology, Chaudhary Charan Singh University, Meerut
E-mail: istkharrao@gmail.com

Results oriented applicability of entomopathogenic nematodes carrying gut pathogenic bacteria work in a coordinated manner providing perceptions to use this soil inhabiting lethal due as microbial agent for biomanagement of insect pests. The identity of nematode as *Steinernema abbasi-Xenorhabdus indica* complex was confirmed molecularly and the duo was released in six well plates for providing natural interaction with 4th instar of target pest *Helicoverpa armigera*. The responses were recorded for total and differential hemocytes, phenoloxidase, and proteins profiling at 0, 3, 6, 9, 12, 18 and 24 hours post infection. Total cell count changed effectively from $10.2\pm1.81\times10^5$ to $15.5\pm3.3\times10^5$ cells/mm^3 up-to 9 hours and reduced distinctly up to $8.0\pm2.49\times10^5$ cells/ mm^3 in 24 hours in infected group. Reduction in cell population showed that the juveniles of *S. abbasi* had good ability to penetrate the cellular immunity and start to establish their infection in the larvae within this short time. The PO activity inclined significantly and was recorded highest at 9 hours and lowest at 24 hours in total hemolymph plasma and the cellular fractions. Increment in protein contents observed from 3 hours (110.26 mg/ml to 139.30 mg/ml) to 9 hours (163.01 mg/ml) probably as symptom of early defensive system of insect. SDS-PAGE profile also showed the evolvement and subsequent lost in proteins were supposed the activity of hydrolytic enzymes as the action of hydrolysing of the host proteins. Not any change was observed in Native-PAGE. The results demonstrate that the nematode- bacteria due actively participate to target the insect pest and ultimately causing death at very high rate.

SPP-107

Performance of Rhizospheric Mycoflora Either Toxic or Egg Parasitic Against Root Knot Nematode Infecting Chilli in Yamuna Khadar Delhi

Mohd Amir[1], Neetu Singh[2] and Rupa Upadhyay[3]
[1,2]Amity Center for Biocontrol & Plant Diseases Management
Amity University, Noida, U.P., India
[3]Lady Irwin College, University of Delhi
E-mail:amirzak.khan786@gmail.com

In the present investigation, an attempt has been made to categorize the nature of a number of fungi or mycoflora isolated from rhizosphere soil of root knot affected roots of Green chilli in Yamuna khadar Delhi through in vitro studies with larvicidal tests of all the isolated fungal species/isolates in different

dilutions separately to find out the toxicity and egg parasitization tests. In this study, *Aspergillus niger* has been discretely observed to be highly toxic against the infective J2 larvae with almost negligible percentage of egg parasitization. In the same study, species of *Fusarium* also showed toxicity and exhibited no sign of egg parasitization against *M. incognita*. Out of all the saprophytic fungi *Trichoderma viride* showed maximum egg parasitization during in vitro test while least one was *Aspergillus niger*. Two fungal genera *Aspergillus* and *Trichoderma* showed remarkably high mortality of *Meloidogyne incognita* larvae and categorized as toxic and egg parasitic respectively. The selected isolates are maintained on starch rich medium for further IPM studies either alone or together with already evolved IPM packages for combating location specific field maladies.

SPP-108

Role of solar energy in IPM techno-package to inhibit incidence of disease-complex caused by root knot nematode, *Meloidogyne graminicola* and root rot fungus, *Rhizoctonia solani* on rice

Neetu Singh
Amity Center for Biocontrol & Plant Diseases Management
Amity University, Sector–125, Noida, U.P., India
E-mail: nsingh19@amity.edu

Out of ignorance and indiscriminate or overuse of toxic chemical pesticides by our farmers of Western U.P has created their farmlands a *dump yard of toxic residues* destroyed the health of the soil, crop and more seriously the farmers and consumers .As a remedial and alternative approach, therefore, the present investigation targeted towards evolving a safe and cost effective farmers 'friendly management package initiated by utilizing soil solarization clubbed with organic amendment, neem oilseed cake and/or chopped cabbage leaves followed by other sustainable components i.e. indigenous strain of fungal bioagent, *Trichoderma harzianum* grown on starch rich grains as the core one along with biofertilizer, AM fungus *Glomus etunicatum* as root protectant against the root invaders viz. root knot nematode *Meloidogyne graminicola* and root rot causing fungus *Rhizoctonia solani* of rice nurseries in and around G.B Nagar of Western U.P. The resultant effect of solar assisted treatment with all components with sequential manner expressed most outstanding performance in management of the disease-complex at nursery level.

SBT-101

Proline content: as a measure of Drought Stress Tolerance in Wheat (*Triticum aestivum* L.)

Aastha, Vaishali, Vandana Sharma, Vishakha, Khyati Lehri and Naresh Pratap Singh
Deptt. of Agriculture Biotechnology, S.V.P. University of Agriculture and Technology, Meerut (UP) 250110.
E-mail: astha.saggi@gmail.com

Drought stress mostly affects accumulation of some organic compatible solutes in wheat crop, which adjust the intercellular osmotic potential. Higher accumulation of organic compatible solutes, increase the solute potential which prevent the loss of water. Proline is a common and important osmoregulator that is produced in response to stresses. It is an amino acid known for its sensitivity to drought and also protects cells against damage induced by ultraviolet radiation. Proline acts as a signaling molecule and trigger specific gene expression, which can be essential for plant recovery from stress. Wheat genotypes accumulate the proline in greater extent than the other osmoregulators in drought stress condition. The proline level in control plant is also found to vary between varieties of the same crop grown under same physiological and environmental conditions. Concentration of proline has been shown to be generally higher in stress-tolerant than in stress-sensitive plants. It influences protein solvation and preserves the quarternary structure of complex proteins, maintains membrane integrity under stress condition. The proline content increase as the drought stress increased and a positive correlation exists between the proline accumulation and drought tolerance. This phenomenon varies among the wheat genotypes because different genotypes have variable water stress threshold. Wheat genotypes having more accumulation of proline under drought have ability to bear drought stress by regulating and reducing water loss from the cell during episodes of drought stress condition. Hence the higher proline content considered as a beneficial drought tolerance indicator and may be used as selection criteria in wheat breeding program.

SBT-102

MicroRNA network analysis revealed the axis of proliferation and apoptosis oral squamous cell carcinoma (OSCC) – First report

Ajay Francis Christopher[1], Mridula Gupta[2], Parveen Bansal[3], Maya Datt Joshi[4] and Amar P. Garg[4]

[1],[4,5] Shobhit Institute of Engineering & Technology, Meerut, U.P. (India).
[2] Punjab Agricultural University Regional Station, Faridkot-151203, Punjab, India.
[3] Division of Clinical Research, University Centre of Excellence in Research, Baba Farid University of Health Science, Faridkot-151203, Punjab, India.
E-mail: ajbees@rediffmail.com

Although substantial advancement has been achieved there is poor prognosis and limited therapeutic options for OSCC. Till date no miRNA-miRNA interaction network (micronome) has been developed to understand cell proliferation (CP) and apoptosis (AP) together in OSCC.To identify key dysregulated genes and common miRNAs controlling CP and AP using bioinformatic tools. Differentially expressed OSCC genes were obtained from reputed oral cancer gene databases. Gene ontology of the dysregulated genes was performed using STRING v10 for CP and AP and their positive (+ve) and negative (-ve) regulations. Experimentally validated miRNA-target interactions were retrieved from miRTarBase. The target genes of miRNAs were predicted through TargetScan. Key miRNAs and genes were identified via construction of miRNA-miRNA interaction network using Cytoscape 3.3.0. Of the 1109 dysregulated genes, 24 genes were pro-proliferative/anti-apoptotic, whereas 17 genes were antiproliferative/proapoptotic. Micronome constructed between CP+ve and AP-ve regulation revealed 11 miRNAs (miR-379-5p, miR-106b-3p, miR-208b-3p, miR-208a-3p, miR-504-5p, miR-33a-3p, miR-328-3p, miR-376c-3p, miR-197-3p, miR-496 and miR-758-3p), and their direct target were EDN1, HSPA5; HIF1A, NFE2L2; CDKN1A; CDKN1A, ETS1; MDM2; RARB, GSK3B; SFRP1; DAPK1, TGFA; IL18; MDM2 and MDM2 respectively. Micronome between CP-ve and AP+ve regulation revealed five miRNAs (mir-328-3p, mir-33a-3p, mir-504-5p, mir-5195-3p, mir-379-3p), and their direct targets were SFRP1; RARB; TP53; DUSP6, CDK6 and PTGS2 respectively. Protein-protein interaction network revealed CDKN1A as master pro-proliferative/anti-apoptotic gene and TP53 as the master anti-proliferative/pro-apoptotic gene. Micronome constructed revealed the key dysregulated genes and the miRNAs involved in proliferation and apoptosis of OSCC, which are potential therapeutic targets.

SBT-103

Multiple Shooting and Plant Regeneration Through Somatic Embryogenesis from Immature Zygotic Embryo of Jute

Alpana Joshi[1] and Dr. Subrata K Das[2]
[1]Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut
[2]Indian Institute of technology, Kharagpur
E-mail: alpana.joshi@shobhituniversity.ac.in

In vitro plant regeneration protocol has been developed through multiple shooting from germinated seed of Jute, *Corchorus capsularis* cv. JRC 321. Multiple shooting was initiated from cotyledon, hypocotyl, and shoot-tip excised from 2 days old germinated seeds. Only shoot-tip of germinated seed produced multiple shooting successfully on MS basal media supplemented with IBA (0.5mg/l) and BAP (0.2 mg/l). The best regenerative ability was observed when shoot tips were cultured in medium SMM1 supplemented with BAP (1.0mg/l) for one week and then transferred in medium SMM5 supplemented with IBA (0.5mg/l) and BAP (0.2mg/l) in MS basal media. Direct shoots regeneration was obtained only from the cut surface of the shoot tip. Regenerated shoots were rooted in MS-B5 medium with 0.5mg/l IBA and transferred successfully in the glasshouse conditions. Plant regeneration by somatic embryogenesis was also initiated from different explants like - hypocotyls, cotyledons, and immature zygotic embryo. Only immature embryo produced embryogenic calli on MS basal medium containing 0.5mg/l NAA and 0.5mg/l BAP. Globular somatic embryos were produced when the calli were transferred on the medium containing BAP-1mg/l, NAA-0.5mg/l and $AgNO_3$-0.03 mg/l. Bipolar structures, torpedo and cotyledonary structure were also found as maturity stages of the initial globular embryos. The somatic embryos were cultured into plantlets in the maturation media containing MS basal salt with activated charcoal (0.3g/L). Plantlets regenerated from the embryos were rooted and transferred to the field where their survival rate was 100%.

SBT-104

Synthesis of Zinc Oxide (ZnO) and Zinc Sulphide (ZnS) Nanoparticles used for Sustainable Agriculture

Anjali[1], Jyoti[1], Anju Bala[2], Sukhadeep Kaur, Indu Sharma[1], Raj Singh[1]
[1] Deptt. of Biotechnology, Maharishi Markandeshwar Deemed to be University, Haryana
[2] Deptt. of Physics, Maharishi Markandeshwar Deemed to be University, Haryana
E-mail: anjalikanwal1234@gmail.com

Agriculture is always the backbone of many developing countries. Since large scale uses of chemical fertilizer results is an irreparable damage to the soil structure, microbial flora, plants mineral cycles and detrimental effect on food chain. Nanotechnology is the most innovative field of 21st century. Extensive research is going on for commercializing nano-products throughout the world. Among other metal nanoparticles, zinc oxide nanoparticles are very much important due to their utilization in agriculture. Zinc oxide and Zinc sulphide nanoparticles (ZnO and ZnS NPs) also have remarkable optical, physical, and antimicrobial properties and therefore have great potential to enhance agriculture production. As far as method of formation is concerned, ZnO NPs can be synthesized by several chemical methods such as precipitation method, vapor transport method, and hydrothermal process. The biogenic synthesis of ZnO and ZnS NPs by using different plant and microbes' extracts. This green synthesis is quite safe and ecofriendly compared to chemical synthesis. Physicochemical characterization of Nano-fertilizer carried out by SEM, TEM, then confirmed ZnO and ZnS NP homogeneity, FTIR, X-ray diffraction and wurtzite-structure symmetry. This green synthesis is quite safe and ecofriendly compared to chemical synthesis. This paper elaborates the synthesis, properties, and applications of zinc oxide nanoparticles as nano-fertilizer. Since fertilizers are the main concern, developing nano-based fertilizer would be a new technology in this field.

SBT-105

Effect of Nano-fertilizers on Soil Microflora

Charu Gupta and Dhan Prakash
Amity Institute of Herbal Research & Studies,
Amity University UP, Sector-125, NOIDA-201313 (UP) India
E-mail: charumicro@gmail.com

Nano fertilizers are one of the recent advancement tools in agriculture that are developed with an aim to increase nutrient use efficiency, reduce wastage of fertilizers and indirectly the cost of cultivation. Besides this they improve the growth and yield of crop and the quality parameters. Nano-fertilizers are very effective for precise nutrient management in precision agriculture with matching the crop growth stage for nutrient and may provide nutrient throughout the crop growth period. However, it has also been speculated that nano-fertilizers can increase the crop growth up to certain optimum concentrations;

further increase in concentration may cause nutrient toxicity thereby inhibiting the crop growth. It is also necessary to assess the effect of slow-release nano-fertilizer on the soil enzyme activity and soil microbial population. The introduction of nano-fertilizers into the natural environment may pose threat to beneficial microbial communities (bacteria and fungi). The impact of nano-fertilizers on microbial activity could be determined through measurement of soil respiration and enzymatic activities. This review would therefore focus on the effect of nano-fertilizers on the activity of soil microorganisms including both their beneficial and deleterious effects.

SBT-106

Molecular Biology and *In Silico* Approaches for Validation of Conventional Taxonomy

Dr. Sushil Kumar Upadhyay
Deptt. of Biotechnology, Maharishi Markandeshwar (Deemed to be University), Mullana- Ambala, Haryana, India
E-mail: upadhyay.k.sushil@gmail.com

The helminthes are ubiquitous, diversified, occurring in every habitat and distrusted in most of the group of animal kingdom. These are noble creatures due to its diversity, tolerance, and sensitivity to microhabitat, host specificity, climate change, and economic significance in relation to health and hygiene. These micro-faunae are usually dealt by taxonomist along with skilled medical persons for its correct taxonomic identification, biology, diagnosis and pathogenecity. The recorded parasitic worms substantiated through morphological observations based on shape, size, color and morphometric numerals with the assistance of available keys at first. In between the physical and mechanical smash up of developing stages; immature specimens and adults are creating huge bewilderment to conventional taxonomists. After a long back journey of Parasitology, the school of Indian Parasitologists designed an approachable comprehensive numerical tool, so called Polythetic Divisive Classificatory System (Malhotra, et al., 1981). This tool works with comparative account of specimens under investigation to earlier described members of same taxonomic group. The PDCS is might be able to resolve the ambiguity in identification of parasitic helminthes at a certain extent. But it did not lend a hand absolutely to segregate very closely related specimens. Therefore, researchers of the present era supposed to utilize decent and advanced, taxonomic tool for phylogenetic analysis based on exploration of conserved gene sequences and *in silico* analysis. The conserved gene region of parasitic helminthes is an inimitable feature with encoded information which describes all phenotypic and physiological uniqueness of bearing animals similar to barcode of a physical object. In the present investigation author compiled a conclusive methodology of *in silico* approaches for helminthes taxonomy after a note "*this is not to say that traditional taxonomy has become less important*".

SBT-107

Identification and characterization of microRNAs in *Catharanthus roseus* using *insilico* approach

Vibha Vishvkarma
Assistant Professor, Deptt. of Biotechnology, Dr KN Modi Institute of Pharmaceutical Education & Research, Dr. KN Modi Foundation, Modinagar 201204, India
E-mail: vibha.bioinfo@gmail.com

MicroRNAs (miRNAs) are a class of small noncoding RNAs of 18 to 24 nucleotides long, which play significant role in gene regulation at various biological processes in plant life such as genome development, metabolic activities, biotic and abiotic stresses. Furthermore, the study extended towards finding of small ncRNA discovery through homology using genome-wide computational approach. In present study, EST, GSS and WGS data were used as study material and applied comparative genomics based approach for discovery of ncRNAs. In this study 30 novel miRNAs (29 miRNAs from WGS and one miRNA from EST) belongs to 22 families were identified first time in *Catharanthus roseus*. In these 22 families, 14 novel miRNA families were identified. A stable secondary structure of all 30 miRNA precursors was generated according to MFE and MFEI. This criterion is used to distinguish miRNAs or other coding and noncoding RNAs. Moreover, uracil was found to be more leading nucleotide in the first position at the 5' end in mature miRNAs. Twenty-three target genes were identified through psRNA target. These target genes were involved in controlling growth and development in plants. This research attempts to look insight into noncoding RNAs studies in medicinal plants such as *C. roseus* that has widely used in anticancer TIA drugs and shows antioxidant activity. In my research work identified Cro-miR 169a-3p, which is a good biomarker to cure breast cancer, Cro-miR 156 controls the transition from the vegetative phase to floral phase and Cro-miR 172 that is involved in flowering time and floral organ identity in *C. roseus.*

SBT-108

Regulation of molecular targets in protein interceding neurodegenerative disease

Govind Singh[2], Tanu Shiri[1], Sourabh Jain[3], Akash Kumar[2] and Urmila Moral[2]
[1] Deptt. of Genetics and Plant Breeding, CCSU campus Meerut, UP
[2] Deptt. of Bioscience, Vinayak Vidyapeeth Modipuram, Meerut, UP
[3] Deptt. of Biosciences, Shri Ram College, Muzaffarnagar, UP
E-mail: hariomrajpoot931@gmail.com

Study of nervous system *i.e.* neurology related diseases usually interfere with conversation, worsening physical imbalance, symptoms of stiffness in body, weakness, loss of memory, experiencing difficulty in getting up, sitting, walking, tremor in body, muscles symptoms of difficulty in swallowing are found. Most of the neurological diseases can be diagnosed in the initial stage. Is, otherwise he can confuse the

body with serious person. Diseases related to the nervous system can be divided mainly into the following parts, which include diseases related to the brain, diseases related to the nerve muscles, myasthenia gravis, spinal diseases etc. The predominant noradrenic nucleus locale coerulus (LC) in the brain is characterized by weathering in both Alzheimer's disease and Parkinson's disease, but this has not received much attention. It is now believed that the first detectable E-like neuropathology in the hyperphosphorylated to human brain may be used in LC, α-synuclein inclusions in LC represent an early stage in Parkinson's disease, and Experimental LC increases neuropathology and cognitive / behavioral deficits in the animal. The purpose of this review is to consider the causes and consequences of LC pathology, dysfunction and degeneration, as well as to provide their implications for early detection and treatment. They will need to resort to further research to fully understand them and develop targeted medical science. Dopamergic neurons found in the lateral thyroid nigra of humans that give rise to sensorimotor striatum. When a differential loss of dopamine is of interest, a dangerous disease produces Parkinson's disease which becomes faster and more dangerous. Closes contain a subdivision of the ultimate for its control. Diseases related to nervous systems occurring in individuals are caused by protein dissociation and the balance of RNA deterioration that can be fatal to those who live in most frequent depressions, and finally, we can discuss the hypothesis that protein dissociation changing steps and modulating MLO may provide potential new therapeutic strategies for these post-translational modulations (PTM). Not, and currently unusable neurodegenerative disease.

SBT-109

In-vitro regeneration of Datura (*Datura stramonium.* L) from Callus Culture

Jamilu Danjuma Koko, Manisha Chaudhary, Rishi, Sandeep Kumar
Deptt. of Biotechnology, Shobhit Institute of Engineering & Technology, Meerut, U.P. (India).
E-mail: danjumajamilu2@gmail.com

An *in vitro* propagation of Datura form immature flowering buds (anther). Surface sterilization with $HgCl_2$ then culture was separately on MS (Murashige and Skoog in 1962) medium supplemented with 30g/L sucrose, 8g/L agar and different combination of 2, 4, Dichlorophenoxyacetic acid, (at three levels, 0, 1 and 2 mg/L) and kinetin (0, 0.25, 0.5 and 1 mg/L). The formed calli were transferred to regeneration media supplemented with BAP alone (at three levels, 1, 2 and 3 mg/L) or in combination with NAA (at four levels, 0, 0.02, 0.2 and 1 mg/L). The regenerated shoots were rooted in media containing IBA at three levels (0.5, 1 and 1.5 mg/L). The media containing 2 mg/L 2, 4-, Dichlorophenoxyacetic acid + 0.5 mg/L kinetin and 2 mg/L of 2, 4-D alone were found to be the best treatments for callus induction from anther culture. Moreover, the media containing 3 mg/L BAP + 1 mg/L NAA and 2 mg/l BAP + 1 mg/L NAA were found to be the best hormonal treatments to shoot regeneration from calli of anther culture. Also 0.5 mg/L IBA was found to be the best treatment for rooting of regenerated shoots.

SBT-110

Designing Universal Primers for Developing DNA Barcodes of Astavarga Plants

Jyotsana Kushwaha and Alpana Joshi
Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut
Email: jyotsanakushwaha27@gmail.com

Astavarga plants is rare flowering plant found in the Himalayan region. It is the group of eight medicinal plants belonging to Zingiberaceae, Orchidaceae and Liliaceae family. The actual identification of these plants is ambiguous due to lack of documented literature, scant knowledge of natural habitat, and ambiguous morphological identification. DNA barcoding has been widely used for species identification. It is primarily used to identify known species by comparing their unique barcode sequences to reference sequences in public databases, as well as to facilitate species identification. Thus, it has rapidly become a widely recognized and acceptable tool for species discovery. In this study, we have evaluated seven candidate DNA barcodes (nrITS, nrITS2, matk, rbcL, trnTLF, ndhF and trnH-psbA) by aligning DNA sequences of plants belong to Zingiberaceae, Orchidaceae and Liliaceae family. Primer 3 software was used to develop primer set to amplify conserved region of the genome. Different bioinformatics tools, including BLAST and multiple sequence alignment were used to design primers suitable for the amplification of DNA barcodes of Astavarga plants.

SBT-111

A Bioinformatics Studies on TNRC9 Gene- Causing Breast Cancer

K. S. Ravi Teja and Ritu Sharma
Shobhit Institute of Engineering and Technology, Modipuram, Meerut, (U.P.)
E-mail: raviteja14009@gmail.com

Breast cancer genes which can be develop from breast tissue in uncontrollable manner. Breast cancer usually starts in inner lining of milk or the lobules that supply them with milk. These type of cancer usually occur in women especially in USA these cancers will occurred in female more than 40,000 of women.so this cancer will be spread throughout the body and disturb other cells it means to it make normal cells into tumor cells.so one of the gene like TNRC9. TNRC9 is a protein coding gene. Disease associated with TNRC9 may cause breast cancer. TNRC9 is also refer as TOX3 gene. So in this study I use different types of tools for bioinformatics studies and I want to know the complete genetic information of TNRC9 gene and it interaction studies at both genetic and protein levels. So these data can be used for primary studies, and also applied immunological studies using immune informatics studies. So based on the primary data I can proceed for further studies like Next Generation sequencing data analysis(NGSA) which can identify the gene expression levels and regulation process like up regulation and down regulation of genes based upon cutoff value of Venn diagrams of genes, pathway

studies we can conclude it based upon statistics methods. So, these studies used for genetic studies and Epigenetic profiling studies and Docking and simulation used for protein modeling or protein modeling a drug discovery studies at protein levels

SBT-112

In-Silico Characterization of Heat Responsive Transcription Factor under High Temperature Stress in Wheat (*Triticum aestivum* L.)

Khushboo Singh[1] and Mohd Tasleem[2]
[1] Division of Vegetable Science, ICAR- Indian Agricultural Research, New Delhi-110012
[2] Deptt. of Biotechnology, G B Pant Institute of Eng. & Tech., Pauri-Garhwal, U.K.
E-mail: khushboo.aaidu@gmail.com

Heat stress is one of the major problems in wheat growth and yield. It affects the growth and development of plant by causing denaturation of various enzymes, defunct pollen, and pseudo seed setting problem which ultimately affect the productivity. Wheat, being important food grain crop, has been neglected in terms of whole genome sequencing; very limited information is available on stress-associated genes and proteins. The mechanism of thermo tolerance has yet not been elucidated. Transcription factor plays an important role in modulating the thermotolerance by modulating the expression of heat shock protein under heat stress. Transcription factors are protein, which perform their role at transcriptional level by affecting the transcription process of SAGs. Here, we have characterized heat-responsive transcription factor by using bioinformatics tools. The nucleotide sequence of heat - responsive transcription factor was~1.1 kb. Clustal W analysis of heat-responsive transcription factor with other heat-responsive transcription factor sequence (reported from wheat) showed large variability in TFs nucleotide sequence. Based on phylogeny analysis, all HSF reported till date from wheat belongs to same origin as that of *Triticum aestivum* (Accession number KF208548.1). HSF gene showed different number of hits on wheat chromosomes. The image of pfam_Is: shows the presence of HSF_DNA- bind. HSF can be used as a suitable candidate gene for the breeding program or for manipulating the thermo tolerance of wheat using genetic engineering tool in order to develop climate-smart wheat crop.

SBT-113

Transgenic Plants in Food Production

Kratika Keswani, Pushpendra Kumar, Puja, Deepali Mudgal
Deptt. of Agricultural Biotechnology (College of Agriculture)
S.V. Patel University of Agriculture and Technology, Meerut (U.P)
E-mail: kratikakeswani96dd@gmail.com

Transgenic plants are plants that have had their genomes modified through genetic engineering techniques either by the addition of a foreign gene or removal of a certain detrimental gene. A foreign gene inserted into a plant can be of a different species or even kingdom. The first transgenic plant was developed for antibiotic resistance gene in tobacco. Since then, with the rapid development in plant molecular biology and genetic engineering technology, a wide variety of transgenic plants with important agronomic traits such as pest resistance and drought tolerance have been developed, ranging from dicots to monocots that are amenable to genetic modifications. The main purpose in the production of transgenic plants is to produce crops, which have desired traits, quality, and high yield. Besides being beneficial to the agriculture sector, the plants are found to be able to act as the factory for pharmaceutical protein production. The most common genetically engineered (GE) crops now being grown are transgenic varieties of soybean, canola, cotton, and corn. Varieties of each of these crops have been engineered to have either herbicide tolerance or insect resistance (or both). The goal is to allow plant breeders to produce more useful and productive crop varieties by exploiting genes from a wide range of living sources, not just those that can be found within the crop species itself. Progress in traditional plant breeding is limited by the genetic diversity within each crop species, the diversity sometimes available from closely related species, or occasionally useful diversity created within the crop itself by inducing mutations.

SBT-114

Biotechnological Applications for Quality Fruits Production

Muzeev Ahmad[1], Bijendra Singh[2], Khursheed Alam[3], Rishabh Shukla[4], Rajat Singh
Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & Technology Meerut, (U.P.)
E-mail: muzeev1@gmail.com

In fruit crops of long juvenility, incompatibility and sterility are the biggest hindrances for the improvement of fruit crops through conventional fruit breeding. To overcome the biotic and abiotic stresses, enhance the one or few traits in already cultivated traits. The biotechnological tools will prove quite useful to expedite the rate of fruit crop improvement. For production of quality planting material by tissue culture is commercialized in banana and strawberry. The different Biotechnological tools such as in vitro mutagenesis and somaclonal variation are the choicest method for varietal development in

banana. GCTCV-119 and Novaria are the result of somaclonal variation and in vitro mutagenesis, respectively. Somatic hybridization has been explored for the rootstock and scion improvement of citrus. Somatic hybridization research of almost two decades in citrus is yielding fruit now. Embryo rescue has helped in accelerating the pace of stenospermocarpic grape improvement and 'Sweet Scarlet' and 'Thomcord' are two of the seedless table grapevines, which were released using this technique. Rainbow and SunUp transgenic variety carrying resistance to PRSV. These are commercially cultivated in Hawaii of USA. The concept of cisgenics, the genetically transformed fruits are likely to get public acceptance. Molecular marker helps in early diagnosis of sex of dioecious fruit plant like Papaya and Date palm. Marker is screening to resistance for Dagger nematode and pierce disease at university of California in the breeding programs are routinely used for grapevine rootstock improvement.

SBT-115

Genomic Approaches for Enhancing Nutrient Use efficiency in Crop Plants

Krishanu[1], Shailendra Pratap Singh[1], Sweta Mishra[2], Neelesh Kapoor[2], Naresh Pratap Singh[3], Rekha Dixit[1]

[1] Deptt. of Biochemistry & Physiology, College of Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut- 250110 (UP), India.

[2] Deptt. of Fingerprinting, College of Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut- 250110 (UP), India.

[3] Deptt. of Commercial Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, 250110 (UP), India.

There is a dire need for environmentally friendly agricultural practices directed towards increasing the productivity of food crops worldwide today to meet the challenge of feeding the ever-increasing population in era of climate change. Phosphorus (P) Nitrogen (N) and Potassium (K) are the primary key nutrients essential for plant growth and development. Chemical and organic fertilizers are added to soil to make these nutrients available to crops for positive effects on plant growth. However excessive uses of fertilizers deplete quality of soil and cause severe environment damage. Today there is absolute requirement to increase nutrient use efficiency (NtUE) of plants to enhance crop productivity under reduced fertilizer application to protect the environment. Nutrient use efficiency involves uptake of nutrient from soil, its subsequent transport, assimilation, storage and remobilization within the plant. A complex network of genes underlies coordination among these diverse physiological processes. Identification of quantitative trait loci (QTL) linked to NtUE has led to development of Nutrient-efficient crops with increased ability of maximizing yield per unit of nutrient taken up from soil. QTL linked to genetic variation in root hair length, release of root exudates and genes for Pi, nitrate, potassium cation transporters, trans- regulating transcription factors have been identified that are expressed to higher levels to enable nutrient uptake under low nutrient conditions. Potential genomics resources as biological databases, genome-wide association studies (GWAS), next generation sequencing, SNP genotyping holds promise to unravel regulatory network associated with NtUE and

identify novel genes for developing crops with improved uptake and use efficiency through transgenesis, genome editing and molecular breeding.

SBT-116

In vitro shoot initiation of *Elaeocarpus ganitrus* (synonym: Elaeocarpus sphaericus)

Rishi, Manisha Chaudhary, Sandeep Kumar Maya Datt Joshi, Harinder Vishwakarma
Deptt. of Biotechnology, Shobhit Institute of Engineering and Technology, Modipuram, Meerut, (U.P.)
E-mail: teotia.sandeep@gmail.com

Elaeocarpus ganitrus (synonym: *Elaeocarpus sphaericus*) is the tree species belonging to the family of Elaeocarpaceae. In the present study an attempt has been made to initiate shoot of *Elaeocarpus ganitrus*. Shoot initiation is one of the key part for the *in-vitro* propagation process by using stem as explant. For the study different range of plant growth regulators were taken. Initiations of shoots in the cultures of *Elaeocarpus ganitrus* were observed in MS, Anderson and WP medium when supplemented with PGR and Antioxidants in the medium.

SBT-117

CRISPR-editing: A Technology Driven Answer to Expedite Rice Improvement

Sweta Mishra, Ravindra Kumar, Anil Sirohi, Gargi Sharma, Monkia Chaudhary and Sanjay Yadav
College of Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, UP
E-mail: sweta_biotech@yahoo.co.in

The CRISPR technology offers a stable, reliable and sustainable solution for doubling the farmers' income. Breeding higher yielding and premium quality rice is the demand of growing population. There are several fully characterized genes for yield and quality traits those can be tapped with CRISPR/Cas9 technology. GS3 for grain length, Gn1a for number of grains, GW2, GW5, and TGW6 for grain weight, OsSPL13, OsSPL16/GW8, GW7, and Chalk5 to improve rice milling quality and Wx for amylose content (AC) have been targeted through knock-in/out CRISPR/Cas9-mediated genome editing to improve elite cultivars without any penalty in other desirable agronomic traits. The fragrant gene Badh2 in was edited by the CRISPR/Cas9 to increase the accumulation of 2AP, and enhanced fragrance in rice. The CRISPR/Cas9 system was used to knock out five rice carotenoid catabolic genes (OsCYP97A4, OsDSM2, OsCCD4a, OsCCD4b, and OsCCD7) to increase β-carotene accumulation in rice endosperm. A knockout of the blast resistance gene OsERF922; Bsrk-1 and *Os8N3* genes resulted in enhanced resistance to Blast and *Xanthomonas oryzae* pv. *oryzae* of rice without compromising yield.

Knockout of the OsNramp5 transporter gene for cadmium (Cd) led to the development of rice lines with low Cd accumulation. CRISPR/Cas9 mediated mutations to 13 genes associated with the phytohormone abscisic acid, enhanced tolerance of abiotic stresses, such as drought, soil salinity and other environmental factors and produces 25-31 percent more grain.

SBT-118

First report: Morphological and Molecular identification of *Saprolegnia australis* from early life stages of endangered Golden mahseer, *Tor Putitora*

Tarang Kumar Shah[1], Avdhesh Kumar[1], Ritesh S Tandel[2], Debajit Sarma[2] and Aadil Raja Bhat[2]
[1] Deptt. of Aquaculture, G.B. Pant university of Agriculture and Technology, Pantnagar
[2]Fish Parasitology & Mycology Laboratory, ICAR-Directorate of Coldwater Fisheries Research, Bhimtal
E-mail: kunnushah4545@gmail.com

Saprolegniasis is one of the most devastating oomycete diseases in freshwater fish which is caused by genus Saprolegnia sp. including *Saprolegnia australis*. The cumulative mortality is around 15-20% in early life stages of captive reared mahseer. The eggs of golden mahseer showing cotton wool, hyphal growth were collected from farms & hatchery facilities of Bhimtal (29.3393oN, 79.5505oE) and transported in cooling box to Fish Parasitology & Mycology Laboratory of ICAR-DCFR, Bhimtal, processed within 24 hrs to study the cause of mortality. More than thirty infected golden mahseer eggs were check microscopically for the presence of oomycete and examined externally for morphological identifications. Morphological identification confirmed that isolated oomycete belongs to the member of *S. australis*, supported by its typical features including cotton-like mycelium, pitted oogonia with variable shapes, predominantly obpyrifrom with immature and mature oospores, direct zoospore germination internal. Further, Genotypic characterization was done using internal transcribed spacer (ITS) universal primer. ITS 1 and ITS 4 were sequenced. Further, sequence similarity was performed using NCBI BLAST online application. Nucleotide sequences of UKBG 1212 were 99% -100% similar with the sequence of *Saprolegnia australis*. The present scrutiny could supplement the information to the scientific community regarding the prevalence and taxonomic ambiguity which can effectively be resolved using ITS molecular sequencing and further effective control measure can be developed in respect to early life stages of Golden mahseer, *Tor Putitora.*

SBT-119

Morpho-physiological and Biochemical Responses of Wheat genotypes to PEG-induced Drought Stress

Vandana Sharma, Ashwini Kumar, Aastha, Naresh Pratap Singh and Vaishali
Deptt. of Agriculture Biotechnology, S.V.P. University of Agriculture and Technology, Meerut
E-mail: vandana_20sep@yahoo.com

Drought is the most critical abiotic stress that affects growth and development of wheat crop by limiting productivity worldwide. Aim of the present study was to examine the impact of drought condition on morpho-, physio- and biochemical responses of wheat. 20 wheat cultivars were subjected to drought stress induced by different concentration polyethylene glycol (PEG-6000 5, 10 and 15%) along with control (water). Morpho-physiological traits such as germination count (GC), shoot length (ShL) and root length (RL), plant height PH, number of tillers (NT), flag leaf area (FLA), spike length (SL), spikelet number spike^{-1} (SPS) number of grain per spike (GPS), test weight (TW) and days to maturity (DTM), chlorophyll content (ChL) by SPAD (Soil Plant Analytical Development) meter, photosynthesis rate (Pn) by Infra Red Gas Analyzer (IRGA), relative water content (RWC), membrane stability index (MSI) and proline content were evaluated at different growth development stage. GC was significantly correlated with ShL, PH, in control condition and in case of treatment-1 found negatively significant correlation with RL. Otherwise in all the treatments GC was positive and significant correlated with all the traits except, FLA and DTM. In control condition ShL has negatively significant correlation with FLA and ChL. Otherwise GPS, TW, Pn in treatment-1, PH, SPS, in treatment-2 and RL, SPS, GPS, TW, IRGA, MSI, RWC and proline in treatment-3 were positively significant correlated. As the concentration of PEG increased all the traits founds to be decrease except proline content in all the wheat cultivars to different extent. Overall results indicated that RAJ3765 and HD2888 can be considered as drought tolerant and parameters like germination count, shoot length, root length, RWC and higher proline content could provide useful tools for identification of drought tolerant wheat cultivars at growth stage.

SBT-120

Bioinformatics in Agriculture: A Useful Approach to Improve Agricultural Crops against Abiotic Stress

Vishakha Burman, Khyati Lehari, Aastha, Naresh Pratap Singh and Vaishali
Deptt. of Agricultural Biotechnology, SVPUA&T Meerut, 250110 (U.P)

Plant are often subjected to unfavorable environment conditions–abiotic factor causing abiotic stress like decreased water availability, extreme temperature (heating and freezing), decreased availability of soil nutrient and excess of light that play a major role in determining productivity of crop yields. Over

the few decades several traditional and modern breeding methods have been used for Crop improvement to develop the stress tolerance in crop plants to fight against the notorious abiotic stresses. As traditional strategies for crop improvement approach have their limits. The era of genomics research has arisen with new and promising perspectives in breeding improved varieties against abiotic stresses by using bioinformatics. Bioinformatics developed new approaches for in silico analysis as well as experimentally, studies regarding the distribution pattern of the abiotic stress. Several bioinformatics approaches, tools, and resources have already been developed for abiotic stress in crops. Modern sequencing technologies have greatly accelerated genomics and transcriptomics studies in various crop plants. These advancements facilitate Quantitative trait loci (QTL) mapping, genome-wide association studies (GWAS), and genomic selection (GS). Several transcription factors (TFs) act as major TFs concerned with abiotic stress responses across various plant species. In this regard, efforts are being made to understand the stress tolerance mechanism, gene discovery, and interaction of genetic and environmental factors. So in silico resources made highlighted the need for integration of bioinformatics approaches for efficient utilization of resources and a better understanding of complex regulatory networks of abiotic stress tolerance mechanism by gene expression profiling. The information provided by bioinformatics analysis will be helpful to understand the plant responses and the genetic regulatory networks involved in abiotic stress tolerance and efficient utilization of bioinformatics resources for crop improvement.

SBT-121

Cytotoxic Effect of Usnic Acid on Growth and Progression of A549 and H1299 Lung Cancer Cells

Narendra Singh[1] and Rana P. Singh[1, 2]
[1]School of Life Sciences, Central University of Gujarat, Gandhinagar, Gujarat, India
[2]School of Life Sciences, Jawaharlal Nehru University, New Delhi, India
E-mail: narendra20jan@gmail.com

Incidences of cancer are increasing continuously because of adapting cancer associated life styles including chewing tobacco, smoking, physical inactivity and westernized diet. Several strategies are being exploited to decrease the burden of lung cancer, still considerable success has not been achieved so far. Chemoprevention is one of the most promising approaches for reducing the burden of lung cancer, prevention of cancer can be best achieved with natural and synthetic compounds. Usnic acid (UA) a dibenzofuran derivative is a secondary metabolites found in several lichens. Here effect of UA was investigated on important parameters like total cell number, death percentage, cell cycle distribution, and apoptosis on A549 and H1299 cells. UA treatment on A549 (25-100µM) and H1299 (15-60µM) cells decreased total cell number, increased cell death and induces cell cycle arrest and apoptosis in both cell lines in dose and time dependent manner. Induction of apoptosis was accompanied with loss of mitochondrion membrane potential. UA decreases the expression of CDKs (2,4 and 6), cyclin D 1 and cyclin E and increases the expression of CDKIs (p21 and p27) at both transcription as

well as at translation level. Induction of apoptosis is accompanied with increase in expression of cleaved caspase-9 and cleaved PARP. EGFR pathway is reported to promote growth of lung cancer cells; the inhibition of EGFR pathway was observed in UA treated cells. Taken together this study has shown that UA has anticancer potential against lung cancer cells.

SBT-122

Advancement and Application Spectra of Antimicrobial Metabolites produced by Lactic Acid Bacteria

Neha Bisht[1] and Amar P. Garg[2]
[1] Deptt. of Microbiology, Ch. Charan Singh University, Meerut- 250004, India
[2]Shobhit Institute of Engineering & Technology (Deemed-to-be University), Meerut, India

During recent years the interest on novel biological preservation methods has been increasing day by day and supported by research indicates that antagonistic microorganisms and their antimicrobial metabolites are used as natural preservatives to control the growth of undesired microorganisms in food. For improving food safety bio-preservatives using lactic acid bacteria (LAB) and their antimicrobial metabolites are used. These antimicrobial properties of LAB's are derived by the production of various metabolites such as organic acids, hydrogen peroxide and bacteriocins. The most important contribution of LAB is there use in food industry as preservative which extended the shelf life of food products. Researchers are focusing on probiotic bacteria as edible biofilms and for the formulation of functional foods products. It also plays an important role in the production of flavor, aroma and texture of fermented food products. *Lactobacillus fermentum*, isolated from cow milk showed maximum antagonistic activity against common enteric pathogens, highest auto-aggregation assay, highest cell surface hydrophobicity and maximum tolerance against acid, bile and pancreatin which are the desirable potent probiotics attributes hence the result suggest that, *Lactobacillus* may be used as natural bio-preservatives in different food products and also to extent the shelf life of food products.

SBT-123

Applicability of Real Time rt-PCR in diagnosis of Influenza-A (H1N1) Pdm09 Virus Infection

Rajni[1], A.P Garg[1], Amit Garg[2]
[1]Shobhit Institute of Engineering & Technology (Shobhit University), Meerut, UP
[2]LLRM, Medical college, Meerut, Uttar Pradesh.

Influenza virus is a common human pathogen that caused serious, respiratory illness and death. Pandemic H1N1 caused high morbidity and mortality in India. The study is to identify epidemiological

characteristics including clinical and seasonal pattern of suspected cases with H1N1 Infection. A total of 1667 throat and nasal swabs sample were collected at VRDL Lab, Dept. of Microbiology, LLRM Medical College Meerut and tested by Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR). Out of 1667 suspected cases of Inf A(H1n1) Pdm09 virus infection. A total 534 (32 %) were found positive for Inf A(H1N1) and total 18 (3.34%) samples were positive for Influenza-A (Seasonal Flu). The results of this study clearly demonstrate the high sensitivity of our newly developed RT-PCR for the detection of Influenza A virus in stock virus preparations and in clinical specimens. In a considerable proportion of the clinical specimens, Influenza A Virus could be detected only by RT-PCR.

SBT-124

In vitro plant regeneration from immature zygotic embryos of *Commiphora wightii*- an endangered medicinally important desert plant

Sandeep Kumar[1] and Arvind Arya[2]

[1] Deptt. of Biotechnology, School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology (Deemed to be University) Meerut, U.P.

[2] Deptt. of Biotechnology, NIET, Greater Noida, U.P.

E-mail: dr.sandeepkumar@shobhituniversity.ac.in

Present investigation micropropagation of endangered medicinal plant *Commiphora wightii* using immature zygotic embryos explants by modified M.S medium. For immature zygotic embryos on the MS medium containing BAP 3mg/l and IAA 0.5 mg/l with additives, 80% of cultures showed maximum induction of embryogenic callus within 8weeks. A low concentration of auxin along with a high concentration of cytokine in was most promising for the somatic embryo development and maturation of somatic embryos in *Commiphora wightii*. The maximum no. of germination of somatic embryos were observed on hormones free half strength MS medium.

SBT-125

Role of Fragment based Drug Design in the development of Novel Lead Compounds

Surya Pratap Singh[1], Nouratan Singh[2] and Dinesh Kumar[3]
[1]Deptt. of Biotechnology, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow
[2] Deptt. of Physiology, UPUMS, Saifai, Etawah, U.P.
[3] Deptt. of Biotechnology, SIET, Deemed to-be University, Meerut, Uttar Pradesh, India.

The development of fragment based computational novel lead compounds configure an outfit for future research in determined for targeted medication in advancement perceived a powerful prescription for different types of infections. The exact conversation on the most recent advances and procedures will be trotted on the accompanying segments. The flowchart for a conventional computational fragment-based novel lead compounds configuration involves 5 significant advances. To start with, the computer-based fragment design leads the foundation of the diverse part of the good lead compound library. So, thinking about the advancement in computational software's and tools, a gigantic scope of sections can be screened for each test. This guarantees a reasonable level of fragment range and builds the factual plausibility of finding a proper part for a given pocket within the macromolecules. Second, obvious screening of the section library is to find best fitting fragments of small novel lead compound. The parts of small novel lead compound are little mixes, which will now not likely give appealing restricting energies or docking scores all through the docking procedure. In any case, by methods for assessment of the conceivable receptor-ligand associations, similar to H-bond or hydrophobic connections, fitting parts can be distinguished. Third, the structure of the lead compound mixes principally dependent on perceived fragments. As explained above, the development of lead fragment, section connecting, and lead-parts of drug compound consolidating the techniques that can be utilized right now as a good drug compound against the infectious diseases. Fourth, the check of created novel lead compounds with comparing natural examines. The computational approval procedures will be used at the beginning to sift through bogus positives or bogus negatives. The relating natural tests will be going with to officially insist the adequacy of these lead mixes. Fifth, the affirmation of authoritative. The last advance as a rule adds to the system understanding. After the developing, connecting, or blending steps, parts inside a compound may likewise not repeat at the indistinguishable areas from the virtual screening. Affirming the coupling method of the mixes with X-ray crystallography or NMR will uncover the receptor-ligand communications and outfit for the understanding into the system of receptor enactment or restraint.

SBT-126

Bio-nanotechnology: An evolutionary change for cancer therapy with nanomedicines

Vanshika kaushik and Shubha Dwivedi
Deptt. of Biotechnology, IIMT University, Meerut

Advancement in the bio-nanotechnology research have provided a new approach for biological and medical research applications with potential effects in both diagnostics and therapeutics. These nanotechnologies include the application of fluorescent imaging (1nm-100 nm). These nano-particles plays a major role for cancer treatment; protein interacrtions, blood circulation and tumor penetration. Nano-technology based drugs are Abraxane used to treat breast cancer, Albumin bound Pecilateral for lung cancer and pancreatic cancer. This technology has developed in cancer therapy such as carbon-nanotube, dendrimers, nano-crystal, nano-wire, nano-shells. Nano-medicines are having very important role for the specific detection of tumor cells and treatment and diagnosis of cancer. These nanomedicines have capability to deliver the chemotherapeutic agents which provide lower toxicity. The other revolutionizing treatment of cancer is immunotherapy, in such treatment nanomedicines are capable of modulating the behavior of myeloid cells and lymphoid cells. These actions of nanomedicines empowers the anti-cancer immunity and immunotherapy. These direction of the innovative ideas of bio-nanotechnology will increase the development of successful cancer nanomedicines therapies. Visionaries have predicted that one day, researchers will incorporate multifunctionality into nanomaterials. Recently researchers working on further challenges in nanoscience to make it more progressive and advanced and to produce more nanotechnology based products. These contributions can bring more ideas and to provide more views to accept the challenges lied ahead in such different fields.

SBT-127

C-Jun –N- terminal Kinase (JNK) activation enhances sensitization of Colon Carcinoma cells to Radiation by Silymarin

Mitu Lal, Damodar Gupta
Dept.of Capacity Enhancement and Product Induction,
Institute of Nuclear Medicine and Allied Sciences, DRDO Delhi-110054, INDIA
E-mail: damodar.gupta@gmail.com

Colon cancer is the fastest growing cancer today, according to WHO (World health organization) it is the second leading cause of cancer death in women and third in men. Radiation sensitizers are novel agents or compound that target molecular pathway and making cells more sensitive towards radiation. Silymarin is an active constituent of plant milk thistle *(Silybum marianum)*; it exerts antioxidant, free radical scavenging (Reactive Oxygen Species) and anticancer properties through variety of mechanism

in different cell types. It triggers biochemical and signaling events and alters expression of genes involved in apoptosis and signal transduction pathway. C-Jun –N- terminal Kinase (JNK) is known as stress activated protein kinase (SAPK) belongs to family of mitogen activated protein kinases (MAPKs) are activated in response to stress, ultra violet (U.V) radiation and mitogen. JNK pathway plays important role in wide range of cellular processes such as cell proliferation, differentiation, migration and apoptosis. The current study was performed to elucidate mechanism involved in radiation sensitization by silymarin in combination with radiation in time dependent manner. Human colon carcinoma cell lines of large intestine HCT-15 and RKO cells was used during the experiments. Both the cells were treated with silymarin before radiation. Silymarin targets JNK and induce apoptosis in time dependent manner in both the cells. Silymarin and Radiation combination treatment has increased JNK activation and was found to enhance cell death in both HCT-15 and RKO cells.

SBT-128

Effects of Dietary Mannan oligosaccharides on mice gut microbiota

Rahul Vashishtha[1], Sumita Belel[2], Sweta Sanguri[2] Damodar Gupta[2]

[1] Deptt. of Pharmacology, KIET Group of Institutions, Ghaziabad-Meerut Road (NH-58), District: Ghaziabad, Uttar Pradesh 201206, Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow, India.

[2] Deptt. of Capacity Enhancement and Product Induction, Institute of Nuclear Medicine and Allied Sciences, Defence Research and Development Organization, Timarpur, Delhi, India.

E-mail: damodar@inmas.drdo.in

Prebiotics are undigestible oligosaccharides that are fermented and utilized by gut microbiota to maintain growth of beneficial microbes and provide better health benefits and reduces disease risk to host. They act through different mechanisms, such as providing nutrients, preventing pathogen attaching to host cells by binding the thread like fimbria on pathogenic bacteria, interacting with host immune systems and affecting gut morphology. Mannan-oligosaccharide (MOS) is isolated from plant cell walls, seed endosperm and vegetative tissues such as bulbs and tubers, or from cell wall of the fungi, *Saccharomyces cerevisiae*. MOS is a potential prebiotic and is effective in alleviating inflammatory condition of the gut by inhibiting colonization of enteric pathogens. Present study is aimed to determine the prebiotic effects of MOS on gut microbiota of BALB/c mice. The development of new prebiotics products can serve as an alternative to antibiotics. An investigation on BALB/c mice (both male & female) were performed to evaluate the effects of MOS on gut microbiota. Mice were treated with MOS (oral, 200 mg/kg b.w.) and their faecal material was collected every day for appraisal of gut microbiota, just before and after oral administration. The faecal samples were prepared for isolation of microbes in nutrient agar plates under aseptic conditions. Isolation of microbes was done using streak plate and pour plate methods in Nutrient agar plates. Changes in colonies of microbes was observed in nutrient agar plates with respect to their size, number, shape, opacity, colour, etc. with or without MOS treatment. This study revealed that gut microbiota of mice shows variation in microbial populations following MOS treatment. It can be concluded that MOS has the potential to be used as a

beneficial prebiotic for managing the gut microbiota of mice and preventing metabolic issues by promoting growth of beneficial microbes. MOS can also be used as nutraceutical in body weight management and gut health improvement.

SBT-129

Hodiernal tool of DNA sequencing: Nanopore Sequencing

Abhishek Singh and R.S. Sengar
Deptt. of Agricultural Biotechnology, College of Agriculture
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut
E-mail: intmsc.abhi@gmail.com

The revolution of genome sequencing is continuing after the successful second generation sequencing (SGS) technology which is game changer in the field of DNA sequencing. The third-generation sequencing (TGS) technology, led by Pacific Biosciences (PacBio), is progressing fast growing rapidly, moving from a technology once only capable of providing data for small genome analysis, or for performing targeted screening, to one that promises high quality de novo assembly and structural variation detection for human-sized genomes. In 2014, the MinION, the first commercial sequencer using nanopore technology, was released by Oxford Nanopore Technologies (ONT). MinION identifies DNA bases by measuring the changes in electrical conductivity generated as DNA strands pass through a biological pore. Its portability, affordability, and speed in data production makes it suitable for real-time applications, the release of the long read sequencer MinION has thus generated much excitement and interest in the genomics community. While de novo genome assemblies can be cheaply produced from SGS data, assembly continuity is often relatively poor, due to the limited ability of short reads to handle long repeats. Assembly quality can be greatly improved by using TGS long reads, since repetitive regions can be easily expanded into using longer sequencing lengths, despite having higher error rates at the base level. The potential of nanopore sequencing has been demonstrated by various studies in genome surveillance at locations where rapid and reliable sequencing is needed, but where resources are limited.

SBT-130

Molecular and Antibacterial aspects of Green synthesis of Silver Nano particles

Anil Kumar, Surya Pratap Singh, Dinesh Kumar and K. Khasdeo
Deptt. of Biotechnology, Vivekananda Sciences College, Betul, M.P.
Deptt. of Biotechnology, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow.
Deptt. of Biotechnology, SIET, Shobhit Deemed to-be University, Meerut, Uttar Pradesh, India.

In recent cases of various research papers focusing on *E. coli* transition disease are facing significant global health challenges, especially in view of the fact that due to the emergence of resistant and adverse side effects associated with long-term used of effective antibacterial the treatment. It requires the development of safe and powerful options to replace of traditional medicines. The current sequence of events occurring on the nano scale and the developed a master plan has emerged as a novel agent for the possibilities of offering their unique chemical and physical properties. Silver nano particles have been studied primarily for their antimicrobial capacity can be active against many types of bacteria. Silver (Ag) is an essential trace element using as nanoparticles which provides an interesting opportunity for novel antibacterial remedies. The current study focuses on the development of methods of production of silver nanoparticles and their use as antibacterial aspect at the molecular level (DNA). In both EMB and BGLB bacterial cultures were also growing, in which properly developed for *E. coli.* in both cultures respectively, initial pH 6.5 in both media. Silver nanoparticles were synthesized by green synthesis techniques where *Azadirachta indica* leaves were used as catalysts.

SBT-131

Zinc oxide and Copper oxide nanoparticles regulate stevioside content in Stevia plants

Koduru Manoj Kumar Reddy[1], Pragati Misra[2] and Pradeep Kumar Shukla[1]
[1] Deptt. of Biological Sciences, Faculty of Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad 211007, UP, INDIA
[2] Deptt. of Molecular and Cellular Engineering, Jacob School of Biotechnology and Bioengineering, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad 211007, UP
E-mail: pradeepshuklak@yahoo.co.in

Plants constitute a major component of the ecosystem, and of nanoparticles' interaction with different plant system is a consequential factor to comprehend the fate of nanoparticles in the environment and its concomitant jeopardies. The field of agro-nanotechnology has recently been up-surged into a new epoch of discovery to dissect intricate processes and mechanisms for better understanding of plant responses to nanoparticle exposure. *Stevia rebaudiana* Bertoni (family: Asteraceae) is a perennial herb and natural sweetener plant commonly known as 'Sweet weed', 'Sweet leaf', 'Sweet herbs' and 'Honey

leaf' which is estimated to be 300 times sweeter than cane sugar (Chalapathi and Thimmegowda, 1997; Liu and Li, 1995). The leaves of *Stevia* are the source of diterpene glycosides: stevioside and rebaudioside. *Stevia* is also helpful in treatment of hypoglycemia and diabetes because it nourishes pancreas and thereby helps to restore its normal function. An experiment was conducted to assess the effect of different metal-oxide-nanoparticles on the stevioside (%) content. Foliar spray of different metal-oxide-nanoparticles (Copper oxide, Zinc oxide and Silicon dioxide) was done on 15-day old stevia plantlets on weekly intervals for six weeks. The results showed that The maximum stevioside (%) was observed with ZnO NPs (50 ppm) and CuO NPs (50 ppm) and the minimum stevioside (%) was observed with ZnO NPs (75 ppm). This research opens up new avenues for studying the fate of nanoparticles in medicinal plants in the context of their uptake, translocation and alteration of secondary metabolites in a concentration-dependent manner.

SBT-132

CRISPR/Cas-mediated genome editing for crop improvement

Ritu Rani[1], Swati Sharma[1], Ujjwal Sirohi[1] and M K Yadav[1]
[1]Deptt. of Agricultural Biotechnology
Sardar Vallabh Bhai Patel University of Agriculture and Technology, Meerut (U.P)-250110, India
E-mail: rituchaudhary246@gmail.com

The conventional breeding techniques have significantly increased crop production and yield, but new approaches are required to further improve crop production in order to meet the global growing demand for food. Genome editing tools have the potential to change the genomic architecture of a genome at precise locations, with desired accuracy. It refers to a technique, where specialised enzymes that have been modified can insert, replace, or remove DNA from a genome with a high degree of specificity. The Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)/Cas9 (CRISPR-associated protein9) genome editing technology has shown great promise for quickly addressing emerging challenges in agriculture. It can be used to precisely modify genome sequence of any organism including plants to achieve the desired trait. CRISPR/Cas9 is faster, cheaper, precise and highly efficient in editing genomes even at the multiplex level as compared to other genome editing tools such as zinc finger nucleases (ZFNs) and transcriptional activator-like effector nucleases (TALENs). Genome editing technologies have wide practical applications for solving one of the most important tasks of modern biotechnology—the creation of new varieties of crops, which are high-yielding and resistant to abiotic and biotic stresses and also have high nutritional value. Genome editing system has been used in plant breeding (1) to insert point mutations similar to natural SNPs, (2) to make small modifications to gene function, (3) for integration of foreign genes, (4) for gene pyramiding and knockout, and (5) for the repression or activation of gene expression, as well as (6) epigenetic editing.

SBT-133

Biotechnological approaches over conventional methods of Crop improvement

Swati Sharma[1], Ujjwal Sirohi[1], Ritu Rani[1] and M K Yadav[1]
[1] Deptt. of Agricultural Biotechnology
Sardar Vallabh Bhai Patel University of Agriculture and Technology, Meerut (U.P)-250110, India
E-mail: swatisharma194.ss@gmail.com

Crop improvement involves the exploitation of genetic variability followed by several generations. Biotechnological approaches have been proved as a better complement to conventional methods for meeting worldwide demand for quality food. It may take ten or more years to transfer a trait from a donor species into a crop cultivar via conventional strategies. Wide hybridization is an efficacious means of incorporating desirable alien genes into crop cultivars but it has a limitation regarding possibility of transmitting unwanted chromosomes and sterility due to adverse genetic interactions. Modern biotechnological approaches on contrast offers rapid introgression of novel genes and traits into elite agronomic backgrounds. Plant transformation methods successfully introduced gene of interest such as for enhancing soil nutrients utilization, resistance to insects, viral and bacterial diseases etc. Xa 21 resistance gene from rice provides resistance to bacterial blight caused by *Xanthomonas oryzae* introduced into a variety of rice using *Agrobacterium* mediated gene delievery method. Also, Flavr Savr, a genetically modified tomato, became the first commercially grown genetically engineered food to be granted a license for human consumption.

SBT-134

Physiological and Biochemical Changes under the Drought stress in Chickpea (*Cicer arietinum* L.)

R. T. Shende and R. S. Sengar
Deptt. of Agricultural Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut india-250110
E-mail: rajendrashende7@gmail.com

Chickpea (*Cicer arietinum* L.) is an agronomically and economically significant plant for India. It is generally affected by terminal drought which causes retardation of flowering and decreases yield. The aim of this study was to determine significant factors which can be used to identify chickpea plant tolerance to drought stress. Drought is a major factor responsible for loss of productivity in agriculture and results in decline in food production by reducing uptake of water and nutrient. Plants under drought stress show different responses. Changes of, physiology and biochemical in face of drought stress in plants can be seen. With this objective we assessed physiological (fresh and dry weight, relative and real water content) and biochemical (enzymatic and non-enzymatic antioxidants, malondialdehyde, and total protein contents) parameters which were used to measure the impact of drought on chickpea. Among the biochemical changes induced by drought stress can be compatible dissolved in dry

conditions of stress Noted. chickpea genotypes under drought stress conditions. It is shown that the decrease in water potential, reducing the amount of leaf starch and total soluble sugars, hexose and sucrose increases the osmotic regulation of pea genotypes. But some of these differences correlate with changes in carbohydrate composition or the rate of gas exchange may osmotic potential weak effect on stress levels, or stage of plant growth. In above finding all of these characters play essential roles in the drought tolerance of plants.

SBT-135

In vitro screening for Cytotoxic Activity of Phenol extracted from the seed *Salvia hispanica on transformed cell*

Beena Rawat, Manisha Rastogi, Amar P Garg
Deptt. of Biotechnology, School of Biological engineering & Life Sciences
Shobhit Institute of engineering & Technology (Deemed to-be University)
E-mail: beenarawat8@gmail.com

With increasing public health awareness worldwide, demand for functional food with multiple health benefits has also increased. The use of medicinal food to prevent diseases such as cancer, diabetes, obesity, and cardiovascular problems is now gaining concern among the public. Seed from *Salvia hispanica* L. commonly known as Chia is widely consumed for various health benefits Although the presence of active ingredients in chia seed warrants its health benefits, however, the safety and efficacy of this medicinal food or natural product need to be validated by scientific research. The present study is conducted to evaluate the cytotoxic potential of phenol extracted from seed of the *Salvia hispanica* on transformed cell. The extracted phenol was characterized by using high pressure liquid chromatography (HPLC). In order to find the cytotoxic potential of Phenol extracted from *Salvia hispanica* at various concentration on transformed cell by using Sulforhodamine B assay. The morphological changes of cell were determined by using the fluorescent microscopy. Result showed that the phyto active constituent of *Salvia hispanica* can help in the cumulative management of various type of cancer by exerting multiple pharmacological actions like cellular oxidative and reduction homeostasis.

SEC-101

Bioremediation of Heavy Metals Cadmium (Cd), Lead (Pb) and PAHs Naphthalene, Pyrene by Isolated Fungal spp. from Contaminated Agriculture soil near Hindon River

Ankita Gautam
School of Biotechnology, Gautam Buddha University, Greater Noida-201308
E-mail: ankita8gautam@gmail.com

Today anthropogenic activities have persuaded our environment towards critical situation not only air, water, soil but also microflora is under threat. The agriculture soil near Hindon river in Ghaziabad, is continuously contaminated since decades need of hour is to remove the contaminants from it by using microbe. Fungus has potential to remediate the heavy metals (Pb) Lead and (Cd)cadmium, study includes a prior physical chemical and biological study of soil as biodegradation depends upon pH ,temperature, electrical conductivity, Carbon and Nitrogen content, micronutrients, water available and microbial population followed by identification of various PAHs Naphthalene<Acenaphthalene< Pyrene<Benz(a) anthracene were detected by GC-MS and Heavy metals like Lead>Cadmium>Cobalt were detected by AAS out of which (Pb) Lead, (Cd),Cadmium and poly aromatic hydrocarbons Naphthalene ,Pyrene were found in maximum concentration varying 1.0ppm-2.0ppm .Fungal isolates from contaminated soil were optimized for the remediating capacity for both contaminants on selective SDA media with 1ppm,2ppm and 3ppm each fungal treatment replicated thrice then kept under observation for 7 days, 14 days and 30 days. The concentration of residual PAH and Heavy metal were identified by UV -spectrophotometer at 600nm for PAH and 412nm for Lead against control in minimal salt media. Experiment performed at pilot scale followed on field where three blocks are built to check the efficiency of eight isolated strains with *Trichoderma viride*. The study on control plants prior to treatment and after will be checked for the amount of heavy metals and PAHs present in them. The potential fungus will be introduced to agriculture fields and farmers will taught about using fungal fertilizers in soil, their benefit on crop production, human health and loss if consumed untreated soil cultivated crops products.

SEC-102

Potential role of Indian mustard (*Brassica juncea*) in phytoremediation of heavy metal-contaminated soil

Ayush Madan, Mohammad Mustufa Khan, Sanjeev Kumar
School of Biological Engineering & Sciences, Shobhit University Gangoh, Saharanpur, Uttar Pradesh
E-mail: ayush.madaan@shobhituniversity.ac.in

The heavy metal contaminations are drastically increasing into the agro-ecosystem worldwide. These heavy metals are non-biodegradable and toxic to the plants, animals and human beings when exceeding specific thresholds. Contamination of heavy metals into agricultural land occurs due to industrial and

agricultural disposal, waste incineration and urban effluent of wastewater. For the extraction of these heavy metals from agricultural land, phytoremediation may be a possible solution. It is a low cost, non-destructive and harmless method. Several studies suggested that Indian mustard (*Brassica juncea*) may play a potential role to extract heavy metals from the contaminated soils. It is a well-known metal accumulator plant. It has the ability to remove toxic metals from the soil. Several studies reported that Indian mustard has shown great tolerance, uptake and defense mechanism against the stress induced by heavy metals. However, some studies reported that Indian mustard has shown slow growth during fast extraction of heavy metals and it can extract some particular metals only such as zinc (Zn), cadmium (Cd), nickel (Ni), and lead (Pd). Studies suggested that the addition of organic matters, organic chelating agents such as EDTA, soil amendments, and the adoption of suitable cropping systems, intercrops, and fertilizer selection can enhance the phytoremediation capacity of Indian mustard. Growing Indian mustard with these agronomic interventions can enhance the ability to absorb, uptake and concentrate heavy metal from contaminated soils. With increasing industrialization and mining and reducing agricultural land availability, India needs such kind of low cost, the non-destructive and harmless method to reduce the heavy metal contamination from the soil and make it suitable for agricultural activity. Removal of heavy metals from the soil by phytoremediation can also reduce the bioavailability of these toxic metals and reduce their toxic effects and associated diseases.

SEC-103

Isolation, Identification & Characterization of Hydrocarbon Degrading Bacteria: A Bio-remedial Approach to Clean-up Oil Spills

Ayush Madan[1] and Syed Mohsin Waheed[2]
[1]School of Biological Engineering & Sciences, Shobhit University Gangoh, Saharanpur, Uttar Pradesh, India
[2]Deptt. of Biotechnology, Graphic Era (deemed to be) University, Dehradun, Uttarakhand, India
E-mail: ayush.madaan@shobhituniversity.ac.in

One of the major environmental problems today is hydrocarbon contamination resulting from the activities related to the petrochemical industry. Petroleum-based products are the major source of energy for industry, agriculture and daily life. Indian agricultural system completely depends on petroleum based product for the technological advancement and power generation. Leaks and accidental spills occur regularly during the exploration, production, refining, transport, and storage of petroleum and petroleum products. Release of hydrocarbons into the environment whether accidentally or due to human activities is a main cause of water and soil pollution. And accumulation of such pollutant may lead to several health complications including cancer. The technology commonly used for the soil remediation includes mechanical, burying, evaporation, dispersion, and washing. However, these technologies are expensive and can lead to incomplete decomposition of contaminants. The present study deals with the bioremediation of crude oil contamination from surface oil samples. Surface soil of oil spilled area excavated up to 30 cm depth and sufficient number and quantity of samples are to be collected from different places and different depth depending upon the spillage percolation. The

samples are to be transferred into sterile polythene bags, following standard microbiological procedures and should be stored at 4°C and transferred to the laboratory within 24 hrs. The samples are then mixed homogeneously to form a composite representative sample. Samples are to be kept at optimum temperature for further study of presence of oil degrading microbes and their isolation. The microbial growth was observed visually on the Petri dish containing MSM-2 (Mineral Salt Media) and the consumption of crude layer by hydrocarbon degraders. There was a remarkable change in the crude layer over the time period. The agarose plate has shown growth of hydrocarbon degraders and when Gram stained Gram negative and cocci shaped bacteria were observed. Further study to ascertain the ability of microbe as potential hydrocarbon degrader is required and is being carried out at ONGC laboratory.

SEC-104

Impact Assessment of pesticide use in agricultural practice of Coastal Zone

Biplab Ghosh, Gouranga Ghosh and Anupam Ghosh[$]
Asian Marine Conservation Association (AMCA)
42/1, Feeder Road, Belgharia, Kolkata-700056
E-mail: ghosh.biplab9@gmail.com

Climate change' is the major point of discussion of any political & decision- making agenda of any nation in general, and intergovernmental meetings and summits in particular. It is an established fact that the overall climate system, which based upon the local weather formation, is the principal resultant factor of oxygen generation by the marine and coastal flora, more specifically the algae and other microphytes by the process of photosynthesis. If such process is anyway disturbed by the retention or residue that anyway interrupts the process of photosynthesis of the coastal flora, the system of local weather formation would significantly be interrupted. At the same time, it is also the fact that because of world's sustainability depends upon its all the 'key-factors' significantly play into the overall eco-development through the growth in agriculture**,** education and industry, and their respective drivers which can be better understood through Environmental Impact Analysis (EIA). In the contemporary period of time, before changing policy of agricultural practice in coastal zone, particularly in respect of pesticides use to protect the crop in the growing field, it is required to assess the pesticide retention in the vegetative parts of crop plants and soil 'during and after the cultivation', so that prevention measure, in any form, can be taken care of, particularly in the coastal zone. Keeping the situation in mind, analytical experiments were carried out to study the retention capacity of crop plants and corresponding field soil of coastal Andhra Pradesh and DIU to assess the possible impact of agricultural pesticides coming to the contact of coastal water so that the result can be used by further research on the impact of pesticides on coastal flora that continuously produce oxygen in the atmosphere.

SEC-105

Groundwater Arsenic Poisoning Leading to Arsenic Contaminated Food in Bihar: A Major Threat to Agricultural Practices

Abhinav[1], Sneha Navin[1], Arun Kumar[2] and Ashok Kumar Ghosh[2]
[1]School of Biological Engineering and Sciences, Shobhit University, Gangoh, Saharanpur, Uttar Pradesh-India
[2]Mahavir Cancer Institute and Research Centre, Patna, Bihar-India
E-mail: abhinav.gangoh@shobhituniversit.ac.in

Groundwater is the most common, reliable and safe source of irrigation in Indian agricultural system. Incidence of groundwater arsenic contamination has affected millions of people worldwide including India. Specially the population residing near Middle-Gangetic plain of India is highly affected with arsenic contaminated groundwater. At the same time the Middle-Gangetic plain of India is highly fertile and productive for agricultural purposes. West-Bengal, Bihar and Uttar Pradesh are the majorly arsenic affected states in India. Out of 38 districts in Bihar (India), 18 districts have been reported to be severely affected with groundwater arsenic poisoning. In the present study villages of Bihar (near and far Gangetic plains) were targeted and studied for groundwater arsenic contamination and its impact on public health. A detailed questioner survey followed by assessment of arsenic in the groundwater of hand tube wells and assessment of blood samples of the subjects were undertaken. In this study, 100 groundwater samples and 100 human blood samples were analysed. Furthermore, the correlation between arsenic contamination in ground water with depth and its distance from river Ganga was also analysed. The study revealed high arsenic concentration in the groundwater of the villages as well as in the blood samples of the subjects. A positive correlation between elevated arsenic level in groundwater and presence of arsenic in blood samples was also observed in the arsenic exposed population. The general health status of the village population was very poor as the subjects were exhibiting typical arsenicosis symptoms. Apart from this, they were suffering from many other health related issues including cancer. The current situation is much alarming as rural population are at very high risk of arsenic exposure not only through groundwater but also through irrigation system. Therefore, a long term sustainable solution is urgently required for arsenic mitigation in the arsenic-exposed villages.

SEC-106

Impact of Climate Change on Indian Agriculture

Manuj Awasthi, Jaidev Chauhan, Sunil Malik, Gaurav Kumar, and Abhishek Chandra
Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut
E-mail: manujawasthi24@gmail.com

Lately there has been developing worry that adjustments in atmosphere will prompt critical harm to both market and non-advertise parts. This paper endeavours to inspect how environmental change will influence agribusiness in creating nations by investigating the instance of India. by inspecting how ranchers have embraced to the atmosphere, the examination could start to see how they may adjust to environmental change environmental change is relied upon to lopsidedly affect creating nations, whose economies are intently attached to atmosphere touchy areas like agribusiness and which are as of now confronting numerous worries because of populace development, urbanization, industrialization, and globalization. In the tropics and subtropics, where a few harvests are close to their most extreme temperature resilience and where downpour bolstered horticulture overwhelms yields are probably going to diminish for even little changes in atmosphere, which could prompt an expanded danger of insufficient nourishment supply. While the impacts of environmental change can appear to be distressing, there is still expectation. By making quick move to control environmental change, we may never observe the most noticeably awful results. In like manner, as the world embraces cleaner, progressively supportable vitality arrangements, there might be a huge number of new openings made and billions of dollars of financial advantages. some reasonable ways you can fight environmental change like; Purchase sustainable power source authentication for your home force needs, make your home vitality productive, purchase carbon counterbalances, embrace a plant-based eating regimen, diminish nourishment squander, reuse, quit utilizing petroleum derivatives, stop deforestation. Frequently the least fortunate in provincial zones involve the most negligible terrains compelling them to rely upon exceptionally defenceless jobs in territories inclined to dry spell flooding, and different perils.

SEC-107

Climate Change and Its Impact On Agriculture

Manuj Awasthi, Sunil Malik, Jaidev Chauhan and Abhishek Chandra
Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut
E-mail: manujawasthi24@gmail.com

Human development is affected by climate change due to direct and indirect impacts on environmental, social and economic spheres.one of the impacts of climate change is negative effects on crop yield due to uncertain weather pattern, which pose a threat to food security as stated in the fifth assessment report of the Intergovernmental Panel on Climate Change (IPCC). This aggravates the condition of people by impacting their livelihood and Availability. University established a link between the extreme severity

of drought due to climate change and crop failure in Syria. As a consequence of this, food prices increased and many people lost their means of income further deteriorating their situation. This triggered the migration of people from rural to urban areas further stressing the system. Such a situation exacerbated poverty. This effect combined with poor governance sparked violet conflict in Syria further leading to people fleeing the country to escape civil war. The example of Syria highlights interlinked explicit and implicit threats posed by climate change and lack of good governance worsens the problem. Considering the future climate change impacts and risks stated by IPCC, and some parts of the world already experiencing these impacts, it becomes important to discuss the role of governance to address such issues. This paper explains the need for the change in conventional governance system and planning required tackling the challenges posed by climate change. If further discuss the kind of new dimentions required in governance system and the importance of participation of people or various stakeholders in climate adaptation efforts to the build resilience of systems to face these challenges.

SEC-108

Qualitative Analysis of Water Sample of Daurala Industrial Area

Pradeep Kumar, Sandeep Kumar, Maya Datt Joshi, Rupesh Kumar & Dinesh Kumar
Deptt. of Biotechnology, Shobhit Institute of Engineering and Technology, Deemed to-be University, Meerut
E-mail: pradeepmudghal111@gmail.com

Water quality refers to Chemical, Physical and Biological characteristics of water. Various parameters of water quality like pH, Total Suspended Solids (TSS), Dissolved Oxygen (DO), Biological Oxygen Demand (BOD) and Turbidity indicates the potability of water. These parameters are also needed to check in water for the safety of health conditions in human beings for drinking and other purposes. The water samples were collected from Daurala Industrial area and tested for the quality by measuring the various parameters. Although BOD of the water samples are in permissible limit but other testing parameters are not in permissible limit & indicates moderate pollution.

SEC-109

Activated Carbon Based Bioreactor System for Waste Water Treatment in Western UP

Shiva Sharma, Beena Rawat
Shobhit University Technology Business Incubator, Shobhit University, Meerut
E-mail: beenarawat8@gmail.com

Industrial plants in Meerut and nearby region generate increasing amount of wastewater that contain toxic and hazardous organic compounds. This wastewater has transformed the potable water of Kali

Nadi into poisonous water which severely affects the adjacent ground water and become hazardous for local people health. Population living in nearby areas of Kali Nadi are at high risk and is already suffering from fatal health problems as reported by leading NGOs. Therefore, there is a strong urge to address the challenge of transforming Kali Nadi back to its sustainable version.

Multiple technologies are in process of development of waste water treatment including physical methods, chemical and biological methods. While physical methods provide limited solutions such as adsorption, ion exchange and membrane filtration for small sample size, chemical methods such as chemical oxidation, electrochemical degradation and ozonation have the requirements of an effective sludge producing pre-treatment. Biological methods involve low degradation efficiency for specific components of waste at very slow rate and require larger sludge disposable area. Advance oxidation photo catalysis is an emerging technology for waste water treatment; however, the technology is in its infancy stage. Photocatalytic oxidation technology is a potentially useful way to purify wastewater, owing to its powerful oxidation property which can damage the molecular structure of pollutants as well as to deactivate bacteria in polluted water. This technology can be used to treat the industrial effluents rich wastewater entering into the Kali Nadi.

SEC-110

Elevated Groundwater Arsenic Contamination: A Risk Factor for Health and its Monitoring

Punit Chauhan, Prince Thakran, Shiva Sharma, Amit Kumar Singh
Deptt. of Biomedical Engineering, Shobhit Institute of Engineering and Technology, Meerut
E-mail: amit.singh@shobhituniversity.ac.in

Arsenic contamination of groundwater in different parts of the world is an outcome of natural or anthropogenic sources (human-made) pollution, which causes several effects on human health as well as on the environment. About 140 million people in 50 countries are affected by contaminated groundwater. In India, the major population of Uttar Pradesh, West Bengal, Bihar, and Jharkhand are affected by contaminated water. Groundwater is safe for drinking, but it was contaminated by toxicants disposed of in the past decades. The physical parameters of groundwater which are affected by the contamination are pH, chlorine, TDS, dissolved oxygen and toxic chemical. Among them, arsenic is highly toxic in its organic form. In this world, millions of people are dependent on groundwater which is contaminated and causes the side effects on their health. Arsenic is the main element that has the highest toxicological value which affects the growth of children. According to WHO the safe value of arsenic in drinking water is 0.01mg/l. Study shows arsenic causes skin cancer, respiratory diseases, hypertension and imbalance in hormones. Due to late knowledge of arsenic in water consumption and side effects on human health due to lack of awareness, it causes several health effects. Early detection of arsenic in contaminated groundwater will be helpful to cure the above health effects and provide a disease-free environment. Different electrochemical and optical sensors have been developed for the monitoring of arsenic. Among them electrochemical techniques are the most common technique.

SEC-111

Method optimization for the quantitative determination of multi-pesticide residues in sweet potato by using gas chromatography high-resolution mass spectrometry (GC-Orbitrap) in full scan

Sarvendra Pratap Singh and Jyoti Sharma
Deptt. of Biotechnology, Shobhit Deemed University, Meerut, U.P. India
E-mail: sps.chrom@gmail.com

Sweet potato *(Ipomoea batatas)* is known as a tuber vegetable belongs to Solanales taxonomic order like a potato. The cultivation of sweet potatoes is in 117 countries producing 105.19 million tons in 8.62 million hectares. During cultivation, there is the use of pesticides has been involved which is an unregulated application. Because of this, there are few food safety concerns are arising which is non-compliance to trade and very much hazardous to consumer health. Hence it becomes important to monitor the pesticides in sweet potato. GC-MSMS is a well-known technique for the targeted analysis of pesticides based on the SRM optimized method with a unit mass. Due to being limited up to the targeted analysis only. Here to being limitless, gas chromatography with high-resolution mass spectrometry is playing a vital role. By using this technique, without any SRM optimization, a person can do the trace level screening and quantification, targeted as well as non-targeted analysis at the same time. Here targeted to optimize and validate a method for the quantification of chlorinated pesticides in sweet potato by using GC-Orbitrap techniques as per the SANTE/12682/2019 validation guidelines. For the sample preparation, the AOAC 2007.01 QuEChERS (quick, easy, cheap effective, rugged, and safe) method has been preferred and followed by the analysis with GC–Orbitrap full scan mode. The data acquisition and processing carried out by using Thermo Scientific™ TraceFinder™ software. All the targeted analytes fulfilled the acceptance criteria of the identification and confirmation, mass accuracy has been observed <5ppm for the all the selected ion at same retention time, quantification method was validated as per the acceptance criteria given in SANTE/12682/2019 at the levels of 0.01mg/kg and 0.025mg/kg concentration with 70-120% recovery and.<20% RSD. The optimized method is offering excellent sensitivity and selectivity for the selected chlorinated pesticides analysis in sweet potato accordance with FSSAI regulations.

SEC-112

Biochemical Studies of Some Plants Affected by Air Pollution in Prayagraj, U P, INDIA

V K Prabhat[1], Shubhi Singh[2] and Dhiraj kumar[2]
[1]P G Deptt. of Botany, K P H E I, Jhalwa, Prayagraj, U P, INDIA
[2] Deptt. of Agriculture, K P H E I, Jhalwa, Prayagraj, U P, INDIA

The present Comunication deals with biochemical studies of some plants affected by air pollution in Prayagraj, U P, india. Air pollution is a mix of particles and gases that can reach harmful concentrations both outside and indoors. Its effects can range from higher disease risks to rising temperatures. The present investigation is to evaluate the Impact of vehicular emission on some biochemical parameters of two tree species such as *Polyalthia longifolia* and *Azadirachta indica* growing along the roadside in different anthropogenic locations at Prayagraj, India. The biochemical parameters that were taken into consideration were total chlorophyll content, total carbohydrate content and total ascorbic acid content. Plant species differ in their response to air pollutants. Some acts as sink while other act as load. The total chlorophyll content, total carbohydrate content and ascorbic acid content in *Polyalthia longifolia* was higher in residential area as compared to the industrial and commercial areas. Similar result was seen in *Azadirachta indica* with an exceptional increase in the total carbohydrate content in the industrial and commercial areas as compared to the residential area. This work suggests that air pollutants emitted from automobiles and industries adversely affect the biochemical properties of the plants. It further suggests that plants can be used as cost effective biomonitoring tool to assess the quality of air we breathe in. this study is a pioneer in such an important industrial city of the country.

SOF-101

Vermicomposting with Neem Manure: The Need of Today's Natural Farming

Dr. Manisha Baliyan
Deptt. of Zoology, M.M.P.G. College, Modinagar
E-mail: manishabaliyan@gmail.com

The process deals with production of compost by utilizing earthworm to turn the organic waste into high quality compost. The earthworm *Eisenia foetida* is used for this process. Cowdung, dead and decay leaves of tree, dry grasses, kitchen waste and agricultural waste is used for the experiment. The research was conducted to explore the vermicomposting process. A mixture of vermicompost produced by the process and the neem natural manure can be a good natural fertilizer and pesticide for the farmers as a substitute for the chemical fertilizer and chemical pesticide. Temperature humidity and pH of the experimental site was measured during the experiment controlled by natural methods. The Indian farmer is largely dependent on chemical fertilizer and pesticide that requires more money and water for the crop production. Thus, in such a scenario when we are facing many environmental health hazards due

to ground water pollution and water scarcity issue. The vermicompost and organic neem manure combination can be a good substitute for the ab initio combination. the combination contains a good amount of nitrogen and other macro and micro nutrients which gives the soil a good microbial activity and aeration which ultimately leads to the better crop yield and reduce the per hectare burden of crop production in a sustainable and natural way.

SOF-102

Impact of Vermicomposting, Composting and Organic Farming in Vegetable Crops

Rajat Singh, Gaurav Kumar, Manuj Awasthi, Shiwanand Pandey and Sunil Malik
Deptt. of Horticulture, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut
E-mail: rajatsingh51995@gmail.com

Vermicompost is the item or procedure of fertilizing the soil utilizing different worms, generally red wigglers, white worms, and different night crawlers, to make a heterogeneous blend of disintegrating vegetable or nourishment squander, bedding materials, and vermicast, which are additionally called worm castings, worm humus or worm excrement. The synthetic cosmetics of vermicompost are likewise helpful for use in cultivating. Worm cast, in that capacity, has multiple times more nitrogen, multiple times more potassium, and multiple times more phosphorus than standard soil. Those microorganisms, thus, favor the advancement of solid plants. The worms are a powerful method to murder off any infection pathogens. Any potential pathogenic microscopic organisms bite the dust in their guts. Execution of vegetable transplants developed in vermicompost. Tomato (*Lycopersicon esculentum* Mill.), Eggplant (*Solanum melongena* L.), Pepper (*Capsicum annuum* L.), Potato, Sweet corn crossovers, Pak choi, Spinach and Turnip. Development of vegetable transplants was decidedly influenced by expansion of vermicompost, Organic Farming of vegetable yields creates pay through International fares or by sparing generation costs Organic Farming additionally ready to verify a position of India on International markets by delivering high worth vegetable harvests. Vermicompost would not just build natural carbon status of the dirt's yet additionally increment the dirt water holding limit, flocculation of soil and accessibility of supplements, subsequently improve the dirt and harvest generation maintainable. The job of vermicompost in expanding of dissolvable supplements in soil. The new ways to deal with the utilization of natural changes in cultivating have demonstrated to be successful methods for improving the microbial action of soil, keeps up soil temperature, expands soil porosity and invasion of water, improves supplement substance and builds development, yield and nature of the plant.

SOF-103

Impact assessment of Training on Vermi Compost conducted by KVKs

Satya Prakash, A.K. Singh & Bhanita Barua
Deptt. of Extension Education, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar-848125
E-mail: satyaprakashpusa@gmail.com

The over continuous use of chemical fertilizers and plant protection chemicals led to build up of chemical residues in soil and water through leaching and runoff. For sake of growing more food to the entire world, we have taken the wrong road of unsustainability (Chandra Shekhar, 2010). The prime objective: To explore the extent of adoption of vermicompost technology with reference to its consequential changes and impact over the socio-economic and production scenario of the area. The research of the findings revealed that majority of beneficiaries of Samastipur district of Bihar (ie; 62%) adopted vermicompost technology among trainees were moderate in range followed by Mahubani and Muzaffarpur district. In continuation of impact of training on vermicompost technology among the trainees were Majority of beneficiaries of Samastipur district of Bihar (ie; 72%) adopted vermicompost technology among trainees were moderate in range followed by Mahubani (ie; 68%) and Muzaffarpur (ie; 64%) district.

SOF-104

Influencing the Nutrients in Soil and Maintaining Soil Health via Vermicomposting

Tanu Shiri[1], Vani Priyta[2], S.S. Gaurav[1], Neha Bisht[1], Sharun Kumar[2], Nisha Saifi[2]and Urmila Moral[2]
[1] Deptt. of Genetics and Plant Breeding, CCS University, Meerut, UP
[2] Deptt. of Bioscience, Vinayak Vidyapeeth Modipuram, Meerut, UP
E-mail: tanushri240@gmail.com

The tremendous increase in population, industrialization and agricultural production results in accumulation of solid organic wastes. This has created serious problems in the environment and mostly to the soil health and soil fertility. In order to dispose this waste safely, it should be converted non-harmful waste effectively. This is achieved by a biological process known as vermicomposting. It is an environment friendly process, through which we convert a wide variety of wastes into valuable agricultural inputs, involving interactions between earthworms and microorganisms. Although microorganisms are responsible for the biochemical degradation of organic matter, earthworms are crucial drivers of the process as they help in mixing organic waste with soil, by fragmenting and conditioning the substrate and dramatically altering its biological activity. Earthworm act as mechanical blenders and by communicating the organic matter they modify its physical and chemical status,

gradually reducing its carbon and nitrogen ratio increasing the surface area exposed to microorganisms and making it much more favorable for microbial activity and further decomposition. The end product of vermicompost is a finely divided peat like material with high porosity and water holding capacity that contains most nutrient in forms that are readily taken up by the plants. This way the process of vermicomposting enhances the soil quality by providing the nutrients to the soil.

SOF-105

Status of Organic Farming in India

Shipra Yadav
Deptt. of Agronomy, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (UP) India
E-mail: shipra9155@gmail.com

Organic farming uses almost exclusively biological and natural materials and processes to produce food. The practice aims to protect human health and conserve, maintain or enhance natural resources, with the goal to preserve the quality of the environment for future generations while being economically sustainable. Organic farming has grown rapidly throughout the world in recent years. One of the most valuable benefits of organic farming is the improvement in soil quality, which can be expressed in terms of chemical, physical and biological properties and their interactions. Demand for organic products, especially in developed countries, has been increasing. On a global level, the organic agricultural land area increased by three percent compared with 2010. The countries with the most organic agricultural land are Australia (12 million hectares), Argentina (3.8 million hectares) and the United States (1.9 million hectares). In India, as on March, 2019 total area under organic certification was 3.56 million hectares and among all the states, Madhya Pradesh has covered the largest area under organic certification followed by Rajasthan, Maharashtra and Uttar Pradesh. With the increasing awareness about the safety and quality of foods, long term sustainability of the system and accumulating evidences of being equally productive, the organic farming has emerged as an alternative system of farming which not only addresses the quality and sustainability concerns, but also ensures a profitable livelihood option. India produced around 2.67 million MT (2018-19) of certified organic products which includes all varieties of food products namely Oil Seeds, Sugar cane, Cereals & Millets, Cotton, Pulses, Medicinal Plants, Tea, Fruits, Spices, Dry Fruits, Vegetables, Coffee etc. The production is not limited to the edible sector but also produces organic cotton fiber and functional food products.

SOF-106

Vermicomposting: A Sustainable Approach for improving Soil health

Shipra Yadav, R. B. Yadav, Rahul Kumar, M. Sharath Chandra
Deptt. of Agronomy, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut
E-mail: shipra9155@gmail.com

Vermicomposting, the transformation of organic waste into vermicompost, is a biooxidative mesophilic process in which detritivorous earthworm species interact with microorganisms, strongly affecting decomposition processes, accelerating the stabilization of organic matter, and greatly modifying soil properties. Vermicomposting and vermiculture are well established worldwide and are important for economic and environmental reasons. As organic matter acts as both the substrate and food in vermicomposting, and soil is not involved, only epigeic earthworms can be used in the process. Among the epigeic earthworms, *Eisenia andrei* and *Eisenia fetida* are the species most widely used in vermicomposting and vermiculture facilities worldwide. Vermicompost is a nutrient-rich, microbiologically-active organic amendment that results from the interactions between earthworms and microorganisms during the breakdown of organic matter. It is a stabilized, finely divided peat-like material with a low C:N ratio, high porosity and high water-holding capacity, in which most nutrients are present in forms that are readily taken up by plants. Addition of compost improves soil physical properties by decreasing bulk density and increasing the soil water holding capacity. Moreover, in comparison with mineral fertilizers, compost produces significantly greater increases in soil organic carbon and some plant nutrients. Long-term beneficial effects of composted materials are also observed in soil humic substances (due to an increase in the complexity of their molecular structure, which increases the humic/fulvic acid ratio), as well as in soil sorption properties (with increased cation exchange capacity and base saturation). In addition to the changes exerted on the chemical and physical properties, composted materials have a clear impact on soil biological properties, such as increases in microbial biomass and activity as well as changes in the activity of soil enzymes and in the structure of the soil microbial community.

SOF-107

Effect of vermicompost, farm yard manure and biofertilizers on growth and yield of Tomato (*Lycopersicon esculentum* Mill)

Vikas Kumar, Anuj Chaudhary, Amit Kumar
School of Agriculture and Environmental Sciences, Shobhit University, Gangoh

Field investigation was carried out to study the effect of organic and biofertilizers on growth and yield parameters in tomato CV pant-1 Western Uttar Pradesh condition during 2018-2019. The experiment

was laid out in a randomized block design with eight treatments School of Agriculture and Environmental Sciences, Shobhit University Gangoh Saharanpur, nutrient management practices vermicompost, farmyard manure and azotobacter. Growth parameters like plant height, number of leaves per plant, diameter of stem and number of branches per plant, and yield attributing parameters like fresh and dry weight of fruit per plant, number of fruit per plant, diameter of fruit per plant and total yield per hectare increased with the application combination of vermicompost @ 8 t/ha+ farm yard manure 10 t/ha + azotobacter 6 kg/ha was much better than other applying of vermicompost, farm yard manure, one and the using of azotobacter with them in tries combinations were the most effective treatments comparing with the others. However, highest values for number of fruit per plant and per plot as well as fruit yield per plot and per hectare was recorded on application of vermicompost @ 8 t/ha+ farm yard manure 10 t/ha + azotobacter 6 kg/ha was the most effective treatment followed by vermicompost @ 6 t/ha+ azotobacter 6 kg/ha, respectively.

SOF-108

Precision Farming - A Modern approach for Sustainable Agriculture

Swati Singh
SVP University of Agriculture & Technology, Meerut, UP
E-mail: svnsbhu@gmail.com

Precision farming is a modern farming concept that looks into the use of technology to improve agricultural production while at the same time lowering the inputs significantly. As it is, Precision farming is an information-driven farming approach, which increases the need for it to be observed. This approach applies measures that are economically and ecologically meaningful to achieve improved output in production. Precision farming and sustainable agriculture rely on the availability of data. Precision farming supports sustainable as well as cost-effective agriculture through the combination of navigation satellites, and earth observation input to make it easy for farmers to make informed decision when farming. For example, the use of sensors helps farmers make decision on how, where, and when to allocate certain resources to improved ecological and economic outputs. The decline in the total productivity, diminishing and degrading natural resources, stagnating farm incomes, lack of eco- regional approach, declining and fragmented land holdings, trade liberalization on agriculture, limited employment opportunities in non-farm sector, and global climatic variation have become major concerns in agricultural growth and development. Therefore, the use of newly emerged technology adoption is seen as one key to increase agriculture productivity in the future. Instead of managing an entire field based upon some hypothetical average condition, which may not exist anywhere in the field, a precision farming approach recognizes site-specific differences within fields and adjusts management actions accordingly. Farmers usually are aware that their fields have variable yields across the landscape. These variations can be traced to management practices, soil properties and/or environmental characteristics.

SPH-101

Various kinds of Measures to Ensure Food Safety

Abhishek Gupta, Rupesh Kumar, Dinesh Kumar, Maya Datt Joshi and Sandeep Kumar
Deptt. of Biotechnology, Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut
E-mail: abhishekgupta715@ymail.com

Food safety is used as a scientific discipline describing handle, preparation and storage of food in ways that prevent food - borne illness. The occurrence of two or more cases of a similar illnesses resulting from the ingestion of a common food is known as a food - borne disease outbreak. This includes a number of routines that should be followed to avoid potential health hazards. In this way food safety often overlaps with food defenses to prevent harm to consumers. The tracks within the line of thoughts are safety between industry and the market and then between the market and the consumer. In considering industry to market practices food safety considerations include the origins of food including the practices relating to food labeling, food hygiene, food additives and pesticide residues, as well as policies on biotechnology and food and guidelines for the management of governmental import and export inspection and certification systems for foods. In considering market to consumer practices, the usual thought is that food ought to be safe in the market and the concern is safe delivery and preparation of the food for the consumer.

SPH-102

Post-Harvest Management of Fruit and Vegetable Peels for Extraction of Pectin

Alpana Prajapati, Akshay Saini, Nishi Chandra and Prof. Samsher
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut – 250110 (U.P.)

Fruits and vegetables are the most utilized commodities among all the horticultural crops. They are consumed raw, minimally processed, as well as processed, due to their nutrients and health promoting compounds. The processing operations of fruits and vegetables produce significant wastes of by products, which constitute about 25% to 30% of a whole commodity group. The waste is composed mainly of peels, seeds, rind and pomace, containing good sources of potentially valuable bioactive compounds, such as carotenoids, polyphenols, dietary fibres, vitamins, enzymes and oils among others. These phyto-chemicals can be utilized in different industries including the food industries for the development of functional or enriched foods, the health industry for medicines and pharmaceuticals industry among others. A valuable by-product that can be obtained from fruit and vegetable wastes is pectin. Pectin comes under the important plant cell wall components. Pectin is obtained by the aqueous extraction of the appropriate plant materials and basically from citrous fruit peel and apple pomace etc.,

followed by a decided precipitation using alcohol or salt. The main use for pectin is as a gelling agent, thickening agent and stabilizer in food.

SPH-103

Effects of Packaging Materials on Flavor Quality of Foods

Balwant Singh, Dr. Suresh Chandra, Vipul Chaudhary, Sunil kumar and Rahul kumar
Deptt. of Agricultural Engineering & Food Technology, College of Agriculture,
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110, (U.P.) India
E-mail: balwants651@gmail.com

Packaging is a critical component of food products. Widespread and continuously increasing usage of plastics is due to the development of various barrier products. Migration of compounds from packages into foods and absorption of flavor compounds of foods by packaging materials can alter the flavor profiles of foods. Packaging components are Polymers (Monomers, Plasticizers, Antioxidants, blocking agent, Ant slipping agent), Coatings-Ink, Solvents, and Adhesives etc. Technological developments in packaging offer new prospects to reduce losses, maintain quality, add value and extend shelf-life of agricultural produce and consequently secure the food system. HDPE film packaging can extend postharvest life of foods, while curing might have little but beneficial effects in maintaining the quality characteristics. Modified atmosphere packaging (MAP) has been found to extend the shelf life of fruits, but temperature fluctuations could result in quality and aroma changes. There was no significant difference between the effectiveness of the protection provided by the High Density Polyethylene bottle and the High Density Polyethylene sachet at 95% confidence level. A significant difference was observed between the communicative function of the bottle packaged product and the existing sachet-packaged Fresh Taste product. The overall rating of panelist for the sachet and labeled bottle however were satisfactory and very good respectively. More than half of the panelists (52%) indicated the illegibility of the displayed details on the HDPE sachet as the major deficiency.

SPH-104

Production, purification and characterization of extracellular enzyme pectinase from *Aspergillus niger*

Chhavi Goel, Maya Datt Joshi, Rupesh Kumar, Sandeep Kumar, Dinesh Kumar and Amar P. Garg
Deptt. of Biotechnology, Shobhit Institute of Engineering &Technology (Deemed to be University), Meerut
E-mail: mayajoshi2778@gmail.com

All living cell produce enzyme, without enzyme the metabolism does not occur. The enzyme pectinase breakdown pectin. Pectin is a structural polysaccharide that is found in the cell wall of plants and middle of fruit and vegetables. Pectinase enzyme used in fruit juice extraction, clarification, preparation of wine and in paper and pulp industry. The pectinase enzyme is produced by several plant and microorganism. The main source of microorganism that produced pectinolytic enzyme are yeast, bacteria and large verities of fungi. The main source of fungi that produced pectinase is *Aspergillus niger*. Soil contaminated rotten fruits were collected and to perform serial dilution method, was used to isolate microbes. Several fungi are obtained on the PDA plates. Then cezpak agar medium used to screening of isolates for extracellular enzyme. On the basis of clear zone diameter *Aspergillus niger* was selected for pectinolytic fungi. YEP media used for the production of pectinase at different pH, different temperature and different incubation time. It has been noticed that maximum amount of enzyme activity was obtained after 96 hr of incubation pH 6.5 and temperature 30°C. This show the standard condition of pectinase enzyme production. It is essential to optimize the fermentation medium for cost effective production of pectinase.

SPH-105

WHEY AS A SOURCE OF PEPTIDES WITH REMARKABLE BIOLOGICAL ACTIVITIES

Himanshu Baliyan, Sandeep Kumar and A.P. Garg
Deptt. of Biotechnology, Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: himanshu.balyan@gmail.com

The dairy industry generates increased amounts of whey from milk and cheese. Whey presents a high amount of lactose and proteins, which are analogous with its high BOD and decomposing potential. Whey has been considered as a by-product of dairy industry due to its nutritional, functional and bioactive properties. Bioactive peptides are organic substances formed by amino acids joined by covalent bonds known as amide or peptide bonds. Although some bioactive peptides exist freely in their natural sources, a broad majority of known bioactive peptides is coded in the structure of the parent

proteins and is released mainly by enzymatic processes. The chemical hydrolysis of whey proteins can generate different bioactive peptides, which are described to perform physiological effects in vivo, such as antioxidant, antimicrobial, antihypertensive and anti-diabetic activities. These bioactive peptides play a remarkable role in human health by affecting the digestive, immune, endocrine, cardio-vascular and nervous systems and also associated with immune-modulatory, anticancer, opioid and hypocholesterolemic activities. Bioactive peptides are also considered the new generation of biologically active regulators as they can prevent oxidation and microbial degradation of foods. These peptides also improve the treatment of various diseases and disorders, thus increasing the quality and standard of life. The increasing interest in bioactive peptide research has invigorate established researchers and food industries to investigating the advancement of new nourishment additives and functional products dependent on these potential bioactive peptides.

SPH-106

Therapeutic Potential of Milk Whey Bioactive Peptides

Himanshu Baliyan, Sandeep Kumar and A.P. Garg
Deptt. of Biotechnology, Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: himanshu.balyan@gmail.com

The increased consumer awareness of the health promoting effects of functional foods and neutraceutical is the driving force of the functional food and neutraceutical market. Bioactive peptides are known for their high tissue affinity, specificity and efficiency in promoting health. Bioactive peptides have been identified within the amino acid sequences of native milk proteins. Organic milk is a highest quality source of well-balanced nutrients and also displays a range of biological activities that affects digestion, metabolic responses to absorbed nutrients, growth and development of specific organs, and resistance to disease. Whey is a by-product of cheese or casein developed through hydrolytic reactions catalysed by digestive enzymes and contains usually high levels of lactose, low levels of nitrogenous compounds, protein, salts, lactic acid and small amounts of vitamins and minerals. The uniqueness of whey proteins is due to their ability to boost the level of glutathione (GSH) in various tissues and also to optimize various processes of the immune system. The role of GSH is very critical as it protects the cells against free radical damage, infections, toxins, pollution and UV exposure. Overall GSH acts as a centrepiece of the body's antioxidant defence system. It has been widely observed that individuals suffering from cancer, HIV, chronic fatigue syndrome and many other immune-compromising conditions have very poor levels of glutathione. The sulphur-containing amino-acids (cysteine and methionine) are also found in high levels in whey protein. Bioactive peptides have the potential to be used in the formulation of health-enhancing neutraceutical, and as potent drugs with well-defined pharmacological effects. For this reason, the search for food-derived bioactive peptides has increased exponentially.

SPH-107

Preparation of Different Types of Vinegars using Some Fruits Juices

Jyotsana Singh[1], Priya[1], Amar Prakash Garg[1], Naresh Sirohi[2]
[1]School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology (Deemed-to-be-University). Modipuram, NH -58, Meerut 250110, India
[2]Director, Village Food Product, Village & Post Jhitkari Tehsil Sardhana, Meerut-250342.

Vinegar contains trace vitamins, mineral salt, amino acids and polyphenolic compounds. Vinegar is produced from raw materials containing starch or sugar via sequential ethanol and acetic acid fermentation and is used in variety of food applications. Vinegar can accelerate the solubilisation of calcium, iron, and phosphorus in vegetables and retrains the loss of vitamin. It can improve the absorption of nutrients for human body. In the present study we used apple, sugarcane, guava, black grapes, white grapes, pineapple for preparation of vinegar. These were crushed to extract the juice and were diluted with distilled water to obtain 2-3% (w/v) concentration of free sugar. These were then incubated at room temperature for 3-4 weeks and then filtered through 4-layers of muslin cloth and the procedure was repeated 2-3 times until the clear supernatant was obtained. Thereafter the filtration was incubated with mother culture of Acetobacter under aerobic conditions for further 3-4 month until good smell of vinegar was produced. The contents were centrifuged at 10000 x g to obtain clear supernatant. Spectrophotric analysis at 237, 254, 280 and 465 nm were measured as the data were interpreted. Further experiments with food borne pathogens are in process to find out their bio-preservative value. The effect of vinegar treatment of nutritive value of common eatable will also be assessed.

SPH-108

Bacteriocins: The modern preservatives of the food

Megha Singh and Dinesh Panwar
Deptt. of Microbiology, Ch. Charan Singh University, Meerut 250004

Probiotic foods are a current burning topic in food industry now a day, because of rising harmful health issues due to use and consumption of chemical preservatives. This has led to the development of more natural, safe and minimally processed foods. Bacteriocins, a highly demanding and beneficial bio-preservative in food industry, due to the potent antimicrobial nature and ease of production by LAB have become a prime topic for research. Bacteriocins are antimicrobial peptide produced by a wide variety of bacterial species. They were defined as "protein biomolecule which possess antagonist activity within species and are lethal to bacteriocin sensitive organisms". Bacteriocins were isolated from LAB's from dairy as well as non-dairy samples such as meat, silage, fruit, vegetables and grains. Microorganisms produced mainly two kinds of metabolites, first one being produced are primary metabolites which help the bacteria to grow, and secondary metabolites produced for their defence. So

the bacteriocins are produced as secondary metabolites by the bacteria through the fermentation process. The inhibitory spectrum of some bacteriocins includes food spoilage and food-borne pathogenic microorganisms. From the group of bacteriocin producing LAB's some of the genera have benchmarked their presence such as *Leuconostoc, Lactobacillus, Micrococcus, Streptococcus, Lactococcus and Pediococcus* by showing active antagonism against food borne pathogens (*Listeria monocytogenes*, *Staphylococcus aureus*, *Clostridium perfringens*, *Bacillus cereus* and *Clostridium botulinum).* Various bacteriocins namely amylovorin, plantaricins, sakacins, bavaricins etc. have been developed from the *Lactobacillus* isolates. For the Bacteriocin application, directly to the food materials requires production and optimization of the physiochemical conditions while fermentation process which are strain specific such as pH, temperature, incubation period. Bacteriocin are a great help to both food industries and consumers as well, although many of these antimicrobial peptides have been discovered but still there's an emerging requirement of more bacteriocins to be identified from different microorganisms so that they can become a defending arm against increasing pathogens.

SPH-109

Development and quality assessment of Tsampa flour and *Moringa oleifera* fortified cookies

Priya Tyagi and Garima Chouhan
Deptt. of Biotechnology, School of Engineering and Technology, Sharda University, Uttar Pradesh

Cookies are confectionary products widely consumed by all age groups and are ideal for nutrient availability, palatability and convenience. The consumption of food rich in whole grains and cereal brans have been reported to possess various health benefits, such as reduction in obesity, and risk for diabetes and cardiovascular diseases. Keeping these objectives in mind, we developed Tsampa and *Moringa oleifera* enriched cookies. For preparation we varied the Tsampa and *M. Oleifera* content along with different concentrations of wheat fluor. The combinations that were taken at different ratios were 0/100/0, 5/90/5, 10/80/10, 20/65/15 and 40/40/20 (Tsampa/ Wheat/ *M. Oleifera*) and these preparations were evaluated for their nutritional properties, physical and sensory attributes. Cookies with 100% wheat flour and no *M. Oleifera* leaf powder served as a reference sample. The proximate results of the cookies showed an increase in protein (10.21-13.16%), ash (1.88-2%), fat (27.95-33.36%) and crude fibre (2.2-6.89%) content. The physical properties of cookies; weight (15-18 g), diameter (50.2-55.6), and thickness (5.20-6 mm) increased with increase in Tsampa and *M. Oleifera*. The sample with 5 and 10% Tsampa flour had the highest sensory score. Based up on the criteria studied, 5 and 10% tsampa flour fortified cookies scored good on sensory and chemical analysis parameters and thus can be utilized for cookie production. In conclusion, fortification with Tsampa and *M. Oleifera* powder can significantly enhance the nutritional status of cookies.

SPH-110

Application of Potato Peel Waste and Its Utilization

Vaishali, Samsher, Harsh P. Sharma, Vipul Chaudhary and Ratnesh Kumar
Deptt. of Agricultural Engineering, SVPUAT, Meerut (UP)
E-mail: juhisharma92@rediffmail.com

Potato (*Solanum tuberosum* L.) is one of the most important agricultural crops for human consumption and high amount is produced worldwide every year. Potato peel waste is a zero value by-product, which occurs in big amounts after industrial potato processing and can range from 15 to 40% of initial product mass, depending on the peeling method. Potato peel waste (PPW) can serve as a basis for phenol extraction, ethanol, lactic acid and enzyme (α-amylase and β-mannanase) production through fermentation. Edible films can be produced from PPW. PPW has a high application potential as antioxidant in food systems. It can prevent lipid oxidation in oils and meat. PPW has potential as a base for fermentation reactions because of high starch content. It can be used in healthy and functional food production as dietary fibre source. It can be used in bakery production and replace up to 10% of flour amount without changes in sensory quality. A potato peel waste is used for producing low value animal feed, fertilizer and also has the properties of antioxidant, antibacterial and anti-inflammatory.

SPH-111

Development and Quality Evaluation of Value Added Food Product as *Burfi* from Elephant Foot Yam

Yashwant Kumar Patel and Poonam Pandey
Assistant Professor and Head of the Deptt. (I/c)
M.Sc (Food Processing and Technology) student
Dept. of FPT, UTD, Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur, Chhattisgarh, India

Elephant foot yam (*Amorphophallus paeoniifolius* Dennst- Nicolson) is an edible tuber crop grown in tropical and subtropical regions. Tuber crop containing a good amount of protein as well as starch, fiber, mineral and vitamins. It is generally known as Suran, Kuch, *Amorphophallus* and Jimikand. It belongs to the Araceae family, because of palatability, cooking quality, medical utility and therapeutic value of its tubers this has been dubbed as "king of tuber". This dissertation studies the properties of elephant foot yam in that we estimated the physico-chemical properties of elephant foot yam and also prepared elephant foot yam powder by sun drying and hot air oven drying methods. We standardized the composition of elephant foot yam to prepare *burfi* and also determine the physico-chemical properties and shelf life evaluation of developed product. Also evaluated the cost analysis for developed product and sensory characteristics of the burfi is analyses by the 9 - point hedonic rating test.

SPH-112

Antimicrobial Potential of Indian Spices: A Novel Approach in Food Preservation

Neha Jha and Vikas Kumar
Deptt. of Biotechnology, Maharishi Markandeshwar (Deemed to be University), Mullana (Ambala)
E-mail: jhaneha0908@gmail.com

Globally, food deterioration caused by microorganisms during storage widely affects all types of food and causes food wastage and loss, even in developed countries. Contamination caused during food storage due to bacteria and fungi are mainly responsible for these types of spoilages. Microbial resistance has weakened the effectiveness of some chemical preservatives presently used to extend shelf-life and improve food safety in the food industry. In addition, the ill effects of utilizing chemicals, synthetic polymers and radiations to preserve food are threatening our livelihood. There has been great interest for the search of alternative and efficient eco-friendly approach for the food conservation as number of untreatable diseases is growing day by day. Spices have a great potential to be developed as new and safe antimicrobial agents. The crude extracts of cinnamon, garlic, basil, curry, ginger, turmeric, mustard, and other herbs exhibit antimicrobial properties against a wide range of microbes. The choice of spices as an alternative option is based on two key reasons: firstly, plants have been the traditional source of medicines since ancient times, and secondly, the growing acceptance by the wider population for herbal medicines. With the world moving towards green consumerism, Indian spices as natural preservatives hold a very important and key role in safety against food borne pathogens.

SPH-113

Preparation of Vinegar from Different Fruit Juices

Priya[1], Jyotsna Singh[1], Amar Prakash Garg[1], Naresh Sirohi[2]
[1]School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology (Deemed- to- be-University), MEERUT, 250110, INDIA.
[2]Director, Village Food Product, Village & Post Jhitkari, Tehsil Sardhna, Meerut-250342.

Vinegar is a weak acid produced by fermentation of ethanol with the help of acetic acid bacteria. It is also called ethanoic or acetic acid. It contains carboxylic group. During acetification, the oxidation of alcohol to acetic acid takes place by members of the genera of *Acetobacter* and *Gluconobacter*. Acetic acid bacteria belong to the family *Acetobacteriaceae*. These are obligate aerobes, Gram-negative, catalase-positive and oxidase negative. The non-spore forming cell is rod to ellipsoidal shaped. In the present study, we used the juices of papaya, pomegranates, lemon, natural dates, wood apple, and amla as substrates for the production of vinegar. These were crushed to extract juice and were diluted with distilled water to obtain 2-3% (w/v) free sugar concentration. These were incubated at room temperature for 3-4 weeks and then filtered through 4-layers of muslin cloth and the procedure was repeated 2-3 times until the clear supernatant was obtained. Thereafter the filtrate was incubated with mother culture of *Acetobacter* under aerobic conditions for further 3-4 months until sufficient smell of vinegar came

out. Spectrophotric analysis at 237, 254, 280 and 465 nm were measured as the data were interpreted. Further experiments with enteropathogens are in process.

SPH-114

Role of Baking Temperature on Products Quality

Ratnesh Kumar, Samsher, Suresh Chandra, Vikrant Kumar, Sunil and Vipul Chaudhary
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut – 250110 (U.P.)

A Baking industry is characterized with a variety of different products that daily find their place on the market. Baking time and temperature highly influence heat transfer and the quality of a baked product, due to complex physico-chemical interactions that occur between the ingredients, leading to the difference, primarily in texture, aroma and color of the products. Baking is a complex process which results in a series of physical, chemical and biochemical changes in the product. Physically, it is a process involving the simultaneous heat and mass transfer phenomena, and both baking time and temperature are industrially important process considerations affecting the final quality. With an aim of improving nutritional and antioxidant capacity of gluten-free cookies by, at the same time, the pomace, which is reviously dried and ground, can be used to substitute a part of the gluten-free mixture to obtain a new gluten-free formulation. Snacks foods comprises a very large array of food items among which are crisps, chips, crackers, nuts, extruded snacks among others, which may be produced through the application of heat in an oven (baking). Currently, there are increasing demands for low-fat or fat-free snack products which make the demand for baked products to increase as against fried products. However, the properties of baked products are naturally influenced by process parameters such as baking temperature to obtain a final product with desirable characteristics having consumer acceptability.

SPH-115

Development of Low Fat Wheat Flour Biscuits

Ratnesh Kumar, Samsher, Suresh Chandra, Vikrant Kumar, Vaishali and Ankur M Arya
Deptt. of Agricultural Engineering, SVPUAT, Meerut (UP)
E-mail: rkindian563@gmail.com

Biscuits are excellent snacks with a long shelf life. However, they are also high-energy foods so there is a great need to improve their nutrient value. Wheat flour has been studied in order to reduce their potential negative impact on human health. The nutritional value of wheat is extremely important as it takes an important place among the few crop species being extensively grown as staple food sources. The importance of wheat is mainly due to the fact that its seed can be ground into flour Short dough biscuits are products made from soft and weak wheat flours and are characterised by a formula high in

sugar and shortening. Fat in a biscuit formulation has a multifaceted function. It is the principal ingredient responsible for tenderness, keeping quality, grain, and texture, and adding richness to biscuits. The food industry is primarily driven by consumer health trends. A present day dietary concern is the consumption of a large amount of fat and sugar. With the growing incidence of obesity and diabetes, low calorie foods have gained immense popularity. Most well-maintained strategies in terms of fat reduction diets involve either the use of low fat foods or fat substitutes or modifications such as trimming of fat from foods. Tasty and healthy foods depend on the addition of high quality ingredients, and biscuits can easily be fortified to manufacture healthier products. The food industry is facing the challenge of developing new food products with special health-enhancing characteristics.

SPH-116

Need of Packaging and Handling of Fruits & Vegetables to Enhance the Profit

S. K. Goyal
Agril Engg., BHU, RG South Campus, Barkachha, Mirzapur (UP)
E-mail: sunil.svbp@gmail.com

India is the second largest producer of fruits and vegetables in the world. Horticultural produces earn excellent through export. Unfortunately, about 25-30% of fruits and 10-25% of vegetables wasted due to lack of postharvest management which resulted in huge loss (crores of rupees). Freshly harvested horticultural produces are made to undergo PHM treatments to minimize losses, increase its shelf-life and add value. Efficient techniques for harvesting, transportation, handling, storage, processing & preservation, packaging, etc. are the components of post-harvest management. While harvesting to handling for storage till marketing several wound pathogens are known to infect the produce that destroy the keeping quality, quantity ultimately economic losses. With fresh fruits and vegetables there are often two levels of packaging. The first is the pack in which the produce is offered to the consumer. The second is the pack that contains the consumer pack and is used to transport the product to the retail market. The length of journey, the environmental conditions, the type of handling and any hazard influence packaging in relation to protection of the produce. The principal benefit of packaging is to provide protection against physical damages through inadequacies in handling and transport of a fresh produce. The correct packaging enables processors to pack fresh and fresh-cut fruit and vegetables and extend their shelf life.

SPH-117

Application of food irradiation techniques and its impact on food shelf life

Sunil, Neelash Chauhan, Vipul Chaudhary, Vikrant Kumar and Ratnesh Kumar
Deptt. of Agricultural Engineering
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut (U.P.)
E-mail: sunilchandelnduat6771@gmail.com

Food irradiation is the process of exposing food and food packaging to ionizing radiation such as gamma rays, emitted from the radio isotopes ^{60}Co and ^{137}Cs or high energy electron and X-rays produced by machine sources. The use of ionizing radiation to destroy harmful biological organisms in food is considered a safe, well proven process that has found many applications. Depending on the absorbed dose of radiation, various effects can be achieved resulting in reduced storage losses, extended shelf-life and improved microbiological and parasitological safety of food. Food irradiation is a cold, non-chemical process in which ionizing radiation penetrates into the food to kill, or prevent reproduction of microorganism, insects and pests. Irradiation is often referred to as a cold pasteurization. It can also be used to sterilize food, which can then be stored for years without refrigeration. It is destroying or inactive organisms that cause spoilage and decomposition and extend the shelf life food. Irradiation destroy insects in or on tropical fruit imported into to the v/s radiation also decreases the need for other, pest control particles that may harm the fruit and as well as it can kill dangerous micro organisms in foods. This process analog to canning, meat, poultry some type of fish and some vegetable and entire meals are suitable for radiation sterilization.

SPH-118

Extrusion technique in food processing

Vaishali, Samsher, Harsh P. Sharma, Vipul Chaudhary and Mithun Kumar

Extrusion technique is a process which combines various unit operations including mixing, cooking, kneading, shearing, shaping and forming. Extrusion cooking is a high temperature short time process which reduces microbial contamination and inactivates enzymes. The main method of preservation of both hot and cold extruded foods is by the low water activity of the products. Different types of shapes can be produces by extruder such as rods, spheres, doughnuts, tubes or shells. The most commonly used extruders in the food industry include single screw and twin screw system, twin screw widely used because of its flexibility. Products produced by extruder are pasta, pet foods, expanded snacks, ready to eat puffed cereals.

SPH-119

"Pulsed Electric Field: A Novel Non Thermal Technique for Food Preservation"

Vikrant Kumar, Jaivir Singh, Sunil, Vipul Chaudhary, Ratnesh Kumar
Deptt. of Agriculture Engineering
S.V.P.U.A. & T. Meerut (UP)
E-mail: vkvk6096@gmail.com

Non-thermal food sterilization technologies have shown that Pulsed electric field (PEF) of high intensities is a viable alternative for sterilization of liquid foods such as fruit juices, milk, liquid egg, wine and many others. Pulsed electric field (PEF) processing involves the application of pulses of high voltage (typically 20 - 80 kV/cm) to foods placed between 2 electrodes. PEF treatment is conducted at ambient, sub-ambient, or slightly above ambient temperature for less than 1 s, achieved by multiple short duration pulses typically less than 5 μs and energy loss due to heating of foods as well as undesirable changes in the sensory properties of the food is minimized. Application of pulsed electric field (PEF) has been found as a new treatment for food preservation where short electrical pulses are applied momentarily to samples through conductive electrodes in direct contact with samples. It is suitable for preserving liquid and semi-liquid foods, removing micro-organisms and producing functional constituents. Application of pulsed electric field (PEF) has been found as a new treatment for food preservation where short electrical pulses are applied momentarily to samples through conductive electrodes in direct contact with samples.

SPH-120

Post-Harvest Losses of Food Commodities and its Management in India

Priyansha Awasthi[1], Aparna Yadav[1], Aanchal[1], Udit Chabra[1] and Samsher[2]
College of Post-Harvest Technology & Food Processing
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut – 250110 (U.P.)
E-mail: samsher_23@yahoo.co.in

India is one of the largest producers of over 80% of agricultural products, including cash crops like coffee and cotton. But due to storage, logistics and financing infrastructure inadequacies harvest and post-harvest losses are maximum estimated at Rs. 92,651 crore. Post- harvest losses happen at every step of the agricultural and food distribution chain, from the field to the ultimate consumer. Post-harvest losses occur during harvesting, handling, storage processing, packaging, transportation and marketing. Post- harvest losses are seen not only in case of perishable commodities like fruits, vegetables and milk but also in case of cereals and pulses. The post – harvest losses means a quantitative and qualitative loss in a given product. Such situation doesn't only reduce the national income but also leads to malnutrition and socioeconomic problems. Both the government and private sector need to invest in research so as

to improve and modernize post-harvest facilities for attaining more efficient market infrastructure and distribution channels. Research and extension activities have to be closely coordinated particularly in the public sector for the benefit of farmers, traders and consumers.

SGT-101

Phytoremediation: A Green Technology for Pollution Reclamation

Rashmi Bisht[1], Sheetal Chanyal[2], Anil Kumar Shankhwar[3], R.K. Srivastava[4]
Deptt. of Environmental Sciences, G. B. Pant University of Agriculture and Technology, Pantnagar,
E-mail: rashbisht2@gmail.com

The utilization of phytoaccumulator plants as a bioengineered tool to detoxify and restoring the polluted soil and water is called as Phytoremediation. The application of biological method based on the higher plants as remedial measure to reclaim the polluted environments is phytoremediation. Plant-based reclamation systems considered as solar pump driven biological systems to detoxify the with an extensive, self-extending uptake network (the root system) that enhances the below ground ecosystem for subsequent productive use. The phytoremediation is an effective tool, economical model, and eco-compatible means of reclamation. Phytoremediation technology is to solving the formidable environmental pollutants including heavy metals, poly aromatic hydrocarbon, petroleum and radio-active residues. In the present era, every sector poses serious threats owing to environmental pollution either it is an industrial, agricultural, medical, chemical laboratory or any other sector. With the increasing the human population the nuisance pollutants load is also become more severe. To overcome from these problems, it is an urgent to remediate the environment systematically. Several phytoaccumulator plants have tremendous potential to suck up the pollutants from waste-water through robust root-channel. Several energy plants reported that use the pollutants as nutrient and uptake it for their growth and development. Thus the phytoremediation is a green technology for pollution remediation.

SME-101

Corona Virus: A Global Medical Emergency

Dr. Stuti Sharma and Dr. Amita Sharma
Dept. of Botany, RG PG College, Meerut
E-mail: drvikas.27nov@gmail.com

This paper is an overview regarding Corona virus. It deals with structure, types of Corona virus, how it spreads, symptoms, treatment and epidemic conditions caused due to its spread. It deals with Novel Corona virus, 2019-nCov cases recorded in China and whole world and how many deaths recorded so

far. It will tell people to protect themselves from this fatal virus by taking some precautionary measures. An overview of case study of Wuhan city of China.

SME-102

Antibiotic Resistance: Approaches, Challenges, Understanding and Practical Consideration

Harshit Verma and Shriya Rawat
Deptt. of Veterinary Microbiology
Deptt. of Veterinary Public Health & Epidemiology
College of Veterinary & Animal Sciences
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut-250110
E-mail: dr_harshitverma@yahoo.co.in

Antibiotics, the wonder drugs have saved the human race from a lot of sufferings due to infectious disease. Without antimicrobial agents, millions of human and animals would have succumbed to infectious diseases. Since subsequent widespread use of antibiotics, a variety of microorganisms have developed numerous competitive/survival mechanisms against antimicrobial agents which is now a day's known as antimicrobial resistance. Microbial resistance to antimicrobial agents is not a new phenomenon. According to World Health of Organisation (WHO) antimicrobial resistance (AMR) is the ability of a microorganism (like bacteria, viruses and some parasites) to stop an antimicrobial (such as antibiotics, antivirals and antiprotozoals) from working against it. It is important to understand the increasing prevalence of resistance and their mechanism in a way to keep current agents useful for a little longer but also to help in the designing of better antimicrobial agents.

SME-103

Universality of Urinary Tract Infection among Pregnant Women and its Complications

Shalagha Sharma[1], Narendra Pratap Singh[2], Jayanand[3] and Ram Saxena[4]
[1,3]School of Biological Engineering and Life Sciences, Shobhit Deemed University, Meerut, U.P
[2,4] Deptt. of Botany, Meerut College, Meerut, U.P
E-mail: shlaghaab@gmail.com

UTIs are the most common complications among pregnant women and has a conspicuous role in increasing the number of stillbirth deliveries. Various physiological and hormonal changes occur in female body during the period of pregnancy. It can be symptomatic or asymptomatic. Asymptomatic bacteriuria can lead to the development of cystitis or pyelonephritis. Gram positive as well as gram negative bacteria like *E. coli, Proteus mirabilis, Klebsiella* sps, *Staphylococci* and *Streptococcus agalactiae* are the most common etiological agent in both symptomatic and asymptomatic urinary tract

infection. Untreated urinary tract infections can lead to significant maternal and perinatal morbidity and mortality. Untreated UTI may lead to most common cause of pre delivery hospitalization and birth of low weight infants. Several serious complications like intrauterine growth, restrictions, pre-eclampsia, preterm deliveries and caesarean deliveries. Moreover, children born with mothers with pyelonephritis are much more prone to impairment of mental and motor development. There is significant correlation between UTI and congenital retardation. Antibiotics like Nitrofurantoin, Trimethoprim or cephalexin are appropriate drug of choice for the treatment, but increasing resistance among microorganisms towards the commonly used antibiotics is the most challenging problem facing by world today. So, it is better to confirm complete eradication of pathogen before quitting the antibiotic therapy. Proper hygiene and various precautions may also help in preventing its occurrence.

SME-104

Research in biophysical mechanisms for the use of human progresses

Tanushiri[2], Nisha Saifi[1], S.S. Gaurav[2], S.K. Singh[3], Swati Sharma[1], Urmila Moral[1] and Vani Priyta[1]

[1]Vinayak Vidyapeeth Modipuram, Meerut, UP

[2]CCS University, Meerut, UP

[3]CCRD PG College, Muzaffarnagar, UP

E-mail: tanushri240@gmail.com

Biophysics is a science that is used to visualize the structure of proteins and viruses and complex molecules, using computer modeling methods. It is also used for collecting the crucial information needed to develop new drug targets. Biophysics, with the application of the principles and methods of physics and the other physical sciences to the solution of biological problems. Many years ago, the frog leg was the most sensitive detector of differences in electrical potential, final acceptance of the view that currents can be generated by using tissues. The use of x-ray nanoparticulate markers for the visualization of intermediate layer and interfaces using scanning electron microscopy. Biophysical effects of ultrasound, is help to provide essential background resource material for the medical/ scientific community and more specifically for scientific working groups. Ultrasonic biophysics is the study of mechanism responsible for how ultrasound and biological materials interact. Electron cryo-microscopy (cryo-EM) is an improved microscope, which is develop by biophysics, better detectors and better software. It is use to obtain near- atomic resolution 3D density maps of macromolecular assemblies using single particle cryo-EM without the need for crystals. While this recent progress has formed some outstanding achievements, if many more problems are solved, it will become more influential method in biotechnology and biophysics.

SME-105

Evaluation of Prevalancy of Microbial Oral Flora between Habitual and Non-Habitual Persons of Chewing Products *in Vivo* Condition

Umeshwar Narayan
Deptt of Microbiology, C. C. S. University Meerut
E-mail: umeshwar1216@gmail.com

Dental caries is one of the common problems in our society. The purpose of the study is to evaluate the prevalence of streptococci along with lactobacilli in dental caries health problem under the supervision of Dr. Amar P. Garg Professor of microbiology. For the research total 108 samples (48 persons of dental caries and 60 persons of non-dental caries) were collected from OPD, Deptt. of Conservative Dentistry, Kalka Dental College Meerut considering to habitual of tobacco and non-habitual persons of chewing products, age and gender. For sample collection patients were instructed to rinse the mouth with phosphate buffer saline for two minute and then samples were collected in sterile wide mouth container, at the same time noted the volume of collected saliva further sample dilution were carried out 1 to 6th test tube and then under aseptic conditions 100 µl diluted samples were spread on culture media mitis-salivarius agar media, crystal violet blood agar media, blood agar media, nutrient agar media. Inoculated plates were incubated in inverted position under anaerobic candle jar at 37^{o} C for two days. After incubation, all cultured plate was observed and microbial colonies were counted to determine CFU (Colony forming unit) on Digital colony counter. In addition, further diagnosis was carried out for isolation and identification of desired bacteria including colony characteristics, Gram's staining, biochemical tests and sensitivity test. The result of present study revealed that bacteria commonly involve in dental caries colonize in dental plaques thus plaque must be considered a specific reservoir of colonization and subsequent dental caries. Increasing of acidogenic bacteria were found in habitual persons of tobacco chewing products. Hence it was found that chewing products increase the occurrence of dental caries.

SME-106

Pseudomonas Aeruginosa Causing Respiratory Diseases in Cystic Fibrosis Patients at Tertiary Care Hospital

Mohd Suhail[1], Ashar, Seema Sood[2], Deepankar Srigyan[2]
[1] Deptt. of Microbiology, Rudra Institute of Technology, Meerut.
[2] Deptt. of Microbiology, All India Institute of Science, AIIMS New Delhi.

Cystic fibrosis (CF) is a chronic, progressive, and frequently fatal genetic (inherited) disease of the body's epithelial cells & mucous glands. CF primarily affects the respiratory and digestive systems in children and young adults. The sweat glands and the reproductive system are also usually involved. On

average, individuals with CF have a lifespan of approximately 30 years. Being an opportunistic pathogen *P. aeruginosa* grows and multiplies in immunocompromised patients, and is particularly prevalent in respiratory secretions of patients with CF. So, this study is aimed to determine the primarily suspected pathogen strains of *P. aeruginosa* and to determine antibiotic susceptibility patterns and establishment of empirical as well specialized therapies among CF patients visiting the leading Tertiary care hospital of New Delhi. The samples of CF Patients were collected from AIIMS New Delhi, during the time period of 1st September 2018 to 28th February 2019. The number of total patients was 134 out of which 81 (60.45%) were males and 53 (39.55%) were females with different age groups. Further, the collected samples including throat swab (137), sputum (134) & Broncho alveolar lavage (1) were processed. The Positive cultures were sub cultured and further identified using standard biochemical tests. The results were further substantiated by MALDI-TOF MS and the antibiotic test was performed by Kirby Bauer disc diffusion method according to CLSI 2018 guidelines. Among the 273 samples collected from 134 patients out of which 138 isolates were those which showed a single type of growth or predominant growth in culture**.** During the study period of 6 months, about 75 *Pseudomonas aeruginosa* isolates were recovered from CF patients. Prevalence of *Pseudomonas aeruginosa* in CF cases is estimated to be 55.55% (75/138) among all bacteria which were found in smaller numbers including- [*Staphylococcus aureus (MRSA)-24.63%, (MSSA)-7.97%]*, *Klebsiella spp*. (1.44%), *Acinatobacter baumanni* (2.89%), *E. coli* (5.07%), *Burkholderia cepacia* (1.44%), *Citrobacter spp. (0.72%), Enterobacter spp. (1.44%)*. We can conclude from our study that common bacterial isolates especially Non-Lactose Fermenters (NLFs) could be misdiagnosed with *P. aeruginosa* and that could lead to multiple clinical manifestations including the deterioration of lungs in suspected patients. The purpose of this study is to gain a deeper understanding of the pathogen (*Pseudomonas aeruginosa*) including its Antibiotic Susceptibility Testing (AST) patterns and prevalence among the patients. So, the specific Identification and Antibiotic susceptibility patterns of *Pseudomonas aeruginosa* may help the clinicians to establish specialized empirical therapy among CF patients.

SME-107

Pathways to a More Sustainable Production of Bio- Energy and its Development

Rashmi [1], Sharun Kumar[1], Tanushiri[2], S.S. Gaurav[2], S.K. Singh[3], Swati Sharma[1], Urmila Moral[1] and Vani Priyta[1]
[1]Vinayak Vidyapeeth Modipuram, Meerut, UP
[2]CCS University, Meerut, UP
[3]CCRD PG College, Muzaffarnagar, UP
E-mail: tanushri240@gmail.com; sharunkb1411@gmail.com

Towards a maintainable energy supply is a clear direction for tentative research in biomass resources. Because of the high petroleum and natural gas prices, the world is implementing national policies and campaigns to encourage bio-energy or biomass production as a means to achieve energy security and reduce dependency on fossil fuels. Bio-energy has been fulfilling the human need for centuries as fossil

fuels and the area of bio-energy requires sophisticated research and development work in botany, agriculture, biochemistry, microbiology and many aspects of engineering. However, there is a basic need to develop technologies and standardize the techniques to reach every area in all over the world. Bio-energy production may also entail harmful environmental effects like deforestation and loss of biodiversity. So, the purpose of this study is to provide proper regulation in order to reduce the negative impacts of large-scale production. It is hoped that this study will help to ensure that the most cost effective and highest energy conversion technologies would be used. Even after the opportunities and risks, criteria for the sustainable development of biomass or bio-energy industry should be clearly established.

SME-108

Probiotic bacteria from human living under hygienic and unhygienic conditions

Siddique Shama Parveen and Amar P. Garg
School of Biological Engineering & Life Sciences, Shobhit Institute of Engineering & Technology (Deemed To be University) Meerut, U.P
E-mail: siddiqueshama20@gmail.com

The term probiotic describes a variety of microorganisms which can colonize the host and have health improving effects on it. It can be introduced in the diet of adults and children both. Regular use could improve the quality of life and reduce the dependence on drugs and medical expenses. Probiotic bacteria are reported to produce vitamins, cholesterol lowering, alleviation of lactose intolerance, cancer prevention, stimulation of the immune system, enhancement of bowel motility, relief from constipation, prevention and reduction of rotavirus and antibiotic associated diarrhea. Intake of probiotics stimulates the growth of beneficial microorganisms in the gut and simultaneously reduces the enteric pathogens thus improving the microbial balance of intestine and lower the risk of gastro-intestinal diseases. Human living under unhygienic environment and eating unhygienic food possess greater immunity against enteric pathogens in comparison to those living under hygienic environment and eating hygienic food. Lactic acid bacteria are generally recognized as safe (GRAS) which plays an important role in the process of fermented food products by inhibiting spoilage bacteria and production of flavor aroma and texture of fermented food. Many clinical studies have proven the effectiveness of probiotics for treatment of diseases such as obesity, insulin resistance syndrome, type II diabetes and non-alcoholic fatty liver diseases. We are isolating the lactic acid bacteria (LAB) from the faces of children living under hygienic and unhygienic conditions to find out the possibilities of isolation and commercialization of better immunogenic LAB.

SME-109

Assessment of engineering properties of jackfruit seeds and functional properties of its flour

Ankur M. Arya, B.R. Singh, Samsher, Suresh Chandra, Neelesh Chauhan and Tarun Kumar
Deptt. of Agricultural Engineering, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (UP) 250210 India.
E-mail: arya.ankur76@gmail.com

The physical properties of jack fruit seed are essential for the design and facilities for the harvesting handling conveying, separation, drying, aeration, storing, and processing. Various types of cleaning, grading and separation equipments are designed on the basis of their physical properties. The length came between22.06 mm to 35.68 mm. whereas the breadth was ranged between10.66 mm to 21.70 mm. The thickness was in between8.72 mm to 15.55 mm. The geometric mean diameter was13.30 mm to 22.61 mm. And the sphericity was found between55.17 mm to 72.70 mm. The jackfruit seed showed bulk density as 0.49 g/ml^3. Whereas the true density was lying between1.02 g/ ml^3 to 1.59 g/ml^3, while porosity came as 1013.15%. The main purpose of drying is to enhance storability, minimize handling and packaging cost. The quality of product and its cost are greatly influenced by the drying operation. The quality of dried product is judged by the amount of physical and biochemical degradation, which occurs during dehydration process. The pre- treatment, drying temperature, time and moisture content influence on the quality but require longer processing time. Functional properties are those qualities in food that provides additional health benefits to consumers and have great impact on its utilization beyond satisfying the basic nutritional requirements. Functional properties of flour are greatly affecting the behaviour of food system and its acceptability for consumption and during storage. The functional properties *i.e.* bulk density, water absorption capacity, oil absorption capacity are the intrinsic physicochemical characteristics which may affect the behaviour of food systems during storage. Water absorption capacity is an important functional characteristic in the development of ready to eat food from cereal grains and high water absorption capacity may assure product cohesiveness. Jackfruit seed can be processed into flour and to be used as a protein and carbohydrate supplement in diets.

SME-110

Molecular Characterization of Cluster Bean [*CyamopsisTetragonoloba*(L.)] using ISSR Markers

D. N. Damse[1], M. N. Bhalekar[2] and P. L Kulwal[3]
[1]SVPUA & T, Modipuram, Meerut (UP).
[2]AICRP on Vegetable Crops, MPKV, Rahuri (MS)
[3] Agril. Botany, State Level Biotechnology Centre, MPKV, Rahuri, (MS)
E-mail: dipakdamse4346@gmail.com

Cluster bean (*Cyamopsis tetragonoloba* (L.) Taub] is important legume vegetable crop also known for its industrial usefulness due to galactomannan gum contained in its seeds. The ability of guar gum obtained from its seed to form hydrogen bonding with water molecules may be the possible reason to use largely as thickener and stabilizer in different industries Despite of its industrial applications its pods are very demanded for serving tasty dishes due to nutritional values and health benefits. The demand for guar from consumption to industrial sector is increasing, this necessitates the need to develop improved varieties with high yield potential and can be grow under adverse conditions. Most of the cultivars of cluster bean have been developed through traditional breeding methods from local high yielding varieties. Hence, Genetic diversity analysis is crucial for breeders to understand diversityof local accessions to select right parent according to breedingobjectives. ISSR markers are more reliable and reproducible then RAPD markers, hence mostly preferred in genetic analysis. These markers are simpler than RFLP, SSR and AFLP, no sequence information is required, also there were limited studies in local cluster beans based on ISSR markers. In this study twenty cluster bean genotypes having good adaptive and yielding capability were selected for diversity analysis using ISSR markers. About 25 ISSR primers were screened for amplification however, 11 primers viz. P-827, P-834, P-817, NISSR-1, NISSR-2, NISSR-3, NISSR-4, NISSR-5, NISSR-7, NISSR-8 shown amplification. Primer P-817, P-825, NISSR -1 and NISSR-3 shown polymorphic banding pattern while rests were monomorphic. The ISSR markers used in this study showed greater degree of polymorphismsuggesting distinction between the different genotypes of cluster bean.

SME-111

Effect of pumpkin flour on various characteristics of Biscuits

Nitin Gupta[1], Maya Datt Joshi, Rupesh Kumar, Sandeep Kumar and Amar P. Garg[2]
[1] Deptt. of Biotechnology Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
[2] Vice Chancellor, Shobhit Institute of Engineering and Technology (Deemed to be University), Meerut
E-mail: nitinhcst2012@gmail.com

Effect of pumpkin flour on the Physico-chemical, rheological, physical and sensory characteristics of biscuits was studied by incorporating pumpkin flour in different concentrations (5%, 10% 15%, 20% and 25%) based on wheatflour. There was one control (T_0) and other five samples (T_1, T_2, T_3, T_4 and T_5) having five different concentration of pumpkin powder. Addition of 15 % of pumpkin powder to wheat flour was found to be optimum for biscuit preparation. Effect of incorporation of pumpkin flour on the alveo-consistographic, mixographic and pasting characteristics of wheat flour were studied. It wasobserved that peak viscosity, breakdown viscosity significantlydecreases whereas, peak time, tenacity increases with the increasein the concentration of pumpkin powder from 5 % to 25%.
Addition of pumpkin flour alsosignificantly affects the textural qualities of the biscuits. Pumpkin flour was incorporated with refined wheat flour and prepared biscuits were also studied for total carotenoids, total sugar and proximate content. The prepared standardized biscuits were stored in two different packaging materials i.e. PP and MP and their storage stability was studied for 60 days and it was found that biscuit stored in MP are more stable than the biscuits stored in PP. There was very less change in the moisture, peroxide value, and free fatty acid and TBA value of biscuit stored in MP. The standardized biscuit was treated with lecithin in three different concentrations i.e. 0.5%, 1% and 1.5 % and it was found that biscuit having 1 % lecithin was accepted on the basis of its sensory characteristics.

SME-112

Determination of Heavy Metals contaminates in Fruits and Vegetables in bank of Yamuna River Delhi NCR region

Prince and Sandeep Kumar
Deptt. of Biotechnology Shobhit Institute Eng. & Technology Meerut (Deemed to be University)
E-mail: princebiotech45@gmail.com

Fruits and vegetables are vital to the human diet, and in particular provide the well-known nutrients to maintain normal physiological functions. The prolonged application of large amount of fertilizers and pesticides has resulted in heavy metal accumulation in fruits and vegetables gardens. Exposure to heavy

metals by the consumption of contaminated fruits and vegetables and its toxicity is a serious concern. This article reviews the presence of heavy metals in different fruits and vegetables, their mechanism of absorption, impact of heavy metals on physiology, and nutrient reduction and associated impact on humans with emphasis on pregnant women based on the existing scientific literature. However, a limited number of studies was found in the data base that examined the reduction of nutrients in the fruits and vegetables due to heavy metal contamination. The heavy metals were found in 153 fruits and vegetables in 61 regions of the world and were above permissible limits in most of the fruits and vegetables. Specific study to human toxicity due to the contamination of heavy metals may be conducted with emphasis on pregnant women, children, and elderly people. Furthermore, strategy and policy should be devised to control the heavy metals in fruits and vegetables and those fruits that are hyper-accumulators of heavy metals should be identified for awareness purposes.

SME-113

Effects of disinfectants and some plant species on coliform bacteria, for possible use in disinfection of water

Rajesh KumarShukla[1], Pramila Gupta[2], Sangeeta Shukla[3]
1 Head Quality Biogene Laboratory, Prayagraj
2 Secretary, YashkrishiTaknikiEvamVigyan Kendra
3 Assistant Professor, Dept of Dairy Microbiology, WCDT, SHUATS

Three water disinfectant (Bleaching powder, Potassium permanganate and Alum) and some plant species (Tulsi, Kush, Nagkesar, Nirmali, Reetha, Pudina, Aonla, Paan) was selected for the study. Chlorine (Bleaching powder) and Potassium permanganate was found effective at lower concentration, whereas Alum was found effective at higher concentration. The effect of plant species was observed non-significant effect in water disinfection. It concluded that optimum concentration of chlorine and potassium permanganate at 2 ppm showed the good effect for disinfection of water whereas all plant species does not show any significant effect in water disinfection.

SME-114

Characterization of algal biomass of *Spirogyra sp.* through (FTIR)

Rupesh Kumar and Prashant Mario D'souza
Deptt. of Renewable Energy Engineering, SHUATS, Allahabad, Uttar Pradesh, INDIA
E-mail: rupraz@rediffmail.com

Algae are considered as one of the potential feedstock for biomass production and about 50% of their weight is oil. It has much faster growth rates than terrestrial plant due to its large surface area and high photosynthetic quotient. Algae play a pivotal role in nutrient cycling and energy flow through aquatic ecosystem and have the capability to produce hydrogen, lipids, hydrocarbons and carbohydrates in different conditions which can be converted into variety of fuels. Fourier transform infrared (FTIR) spectroscopy technique provides an in situ nondestructive chemical analysis of individual cells and best suited to study the characteristics of *Spirogyra sp.* algal biomass. The algal biomass sample was analyzed to identify the surface functionality and thermal stability of biomass. Fourier transform infrared (FTIR) spectroscopy revealed the presence of –OH, -COOH, $-NH_2$ and - C=O groups. The result suggests that the biomass of *Spirogyra sp.*is sustainable green energy source.

SME-115

Crop residue management in Rice-Wheat system

Saurabh Tyagi[1]; Beena Rawat[1]; Arvind Kumar[2]; Snigdha Tiwari[1]
[1] Deptt. of Agriculture; School of Biological Eng. & Life Sciences
Shobhit Institute of Engineering & Technology, Meerut (Deemed to be University)
[2]Barkatullah University Bhopal (MP)
E-mail: srbhtyagi1@gmail.com

Crop residue management is posing a serious problem in the rice *(Oryza sativa)*–wheat (*Triticumaestivum*) cropping system, which is widely practiced in the Indian Subcontinent and China, and covers about 22.5 × 106 ha. The problem is serious because there is very little turn-around time between rice harvest and wheat sowing. Three practices, namely, residue removal, residue burning and residue incorporation were compared in two field experiments, one with the rice residues and the other with the wheat residues. The intelligent management and utilization of crop residues is essential for the improvement of soil quality and crop productivity under rice-based cropping systems of the tropics. Crop residues, usually considered a problem, when managed correctly can improve soil organic matter dynamics and nutrient cycling, thereby creating a rather favorable environment for plant growth. Crop residues contain large quantities of nutrients, and thus the return of crop residues to the soil can save a considerable quantity of fertilizers. The most viable option is to retain residue in the field; burning

should be avoided. Results obtained showed that both rice and wheat residues can be safely incorporated without any detrimental effects on the crops of rice or wheat grown immediately after incorporation. Incorporation of crop residue also improved soil fertility status as judged by organic carbon and available phosphorus and potassium contents. Residue incorporation should be preferred over residue burning, which results in the loss of valuable plant nutrients and is both an environmental and a health hazard.

SME-116

RNA Interference and Crop Improvement

Saurabh Tyagi, Satya Prakash, Beena Rawat
Deptt. of Agriculture School of Biological Eng. & Life Sciences
Shobhit Institute of Engineering & Technology, Meerut (Deemed to be University)
E-mail: srbhtyagi1@gmail.com

Over the past decade RNA interference (RNAi) has emerged as a natural mechanism for silencinggene expression. This ancient cellular antiviral response can be exploited to allow specific inhibitionof the function of any chosen target gene. RNAi is proving to be an invaluable research tool, allowing much more rapid characterization of the function of known genes. More importantly, RNAi technology considerably bolsters functional genomics to aid in the identification of novelgenes involved in disease processes. It has been utilized not only in fundamental research for the assessment ofgene function, but also in various fields of applied research, such as human and veterinarymedicine and agriculture. In plants, RNAi strategies have the potential to allow manipulation ofvarious aspects of food quality and nutritional content. In addition, the demonstration thatagricultural pests, such as insects and nematodes, can be killed by exogenously supplied RNAitargeting their essential genes has raised the possibility that plant predation can be controlled bylethal RNAi signals generated in plant. Indeed, recent evidence argues that this strategy, calledhost-induced gene silencing (HIGS), is effective against sucking insects and nematodes; it alsohas been shown to compromise the growth and development of pathogenic fungi, as well asbacteria and viruses, on their plant hosts. Here, we review recent studies that reveal theenormous potential RNAi strategies hold not only for improving the nutritive value and safety ofthe food supply, but also for providing an environmentally friendly mechanism for plantprotection.

SME-117

Moringa Oleifera Juice Shelf Life Enhancementthrough Membrane Technology

Soumitra Tiwari[1], S.N. Saha[2] and Yashwant Kumar Patel[1]
[1]Deptt. of Food Processing and Technology, UTD, Atal Bihari Vajpayee Vishwavidyalaya, Chhattisgarh
[2]Deptt. of Chemical Engineering, Guru GhasidasVishwavidyalaya, Bilaspur, Chhattisgarh,
E-mail: profykpatel@gmail.com

MoringaOleifera (*MO*) is a major plant crop in Asia and Africa from the family *Moringacea*.MOs leaves, fruits, flowers and roots have been used as vegetables and traditional medicines. It has a distinguish flavour and colour. The leaves are commonly used for medicinal purposes as well as for human nutrition, since they are rich in antioxidants and other nutrients, which are commonly deficient in people living in undeveloped countries. The fresh juice has been extracted from leaves then treated with enzyme. The enzymatic treated juices have been passed with membrane filtration to overcome the microbial load and impurities. The obtained juices have been evaluated the sensorial, physico-chemical and microbiological properties of the MO leaves extract. The observed data showedlonger shelf life for the same. The study will be helpful for scaling up the clarification process in industrial level.

SME-118

Resolving India's Unemployment through Agriculture

Ujjwal Sirohi[1], Swati Sharma[1], Ritu Rani[1], MK Yadav[1], Mukesh Kumar[2]
[1] Deptt. of Agricultural Biotechnology, College of Agriculture, SardarVallabhbhai Patel University of Agriculture & Technology (Meerut)-250110
[2]College of Horticulture, SardarVallabhbhai Patel University of Agriculture & Technology (Meerut)
E-mail: sirohiujjwal@gmail.com

Unemployment is a major social issue in India. The current unemployment rate is the highest in the last 45 years. The unemployment among urban youth (age 15-29 years) is alarmingly high at 22.5 per cent. Agriculture is not fascinating, it suffers from rooted negative perceptions in the minds of many Indian youths as farmer is someone who does backbreaking labor in the fields and getting little to show for it. However,agriculture is the most important sector of Indian Economy. Indian agriculture sector accounts for 18 per cent of India's gross domestic product (GDP) and provides employment to 50% of the countries workforce.Agriculture is capable of providing more self employing jobs and unlocking vast employment opportunities.Among various agricultural practices, vermicomposting is one of the best occupation ever.Vermicomposting is defined as the production of compost with the use of worms. It is

a fast way to convert organic farm waste into organic fertilizer. Composting of organic waste offers solution to large amount of agriculture waste worldwide. It is a natural process of recycling decomposed organic material into a nutrient rich soil known as compost. The product gets matured in a period of 45-60 days depending upon the type of wastes, earthworm population, and environmental factors. Good quality compost production in ambient temperature can be accomplished in shorter time by the process of vermicomposting that involves use of appropriate species of earthworms. The main cost in vermicompost business is the cost of vermi(worm) that keeps on doubling themselves in every three months. Thereis no restriction on who can become a great entrepreneur. You don't necessarily need a degree in agriculture or even business background to start something that could become a major success. However, you do need a short training which is routinely provided by ICAR, initial investment that would depend on magnitude of setup proposed and most importantly a steady drive to see it through.

SME-119

Different food testing techniques used in chemical analysis of food products Readily available in Indian Market

Naveen kasarala

Food is one of the basic need of the humankind therefore it is required for the normal function of the metabolism and the healthy growth of the individuals. The importance and purpose of food testing techniques employed for chemical analysis of food products to determine the good Nutritional parameters in different food products. Food in any form may consists of carbohydrates, protein, fats, water that are consumed by animal/humans for nutrition and growth. The items which are considered for food may be source from plants and animal and others sources so, food testing essentially considered as efficiently production of harmless and valuable products. In today's scenario food industry definitely demands the sound inspection and testing to ensure the good quality and protect the public health .As adulteration prevalently prevails in food industry hence the food testing has a significant role in the analysis of different food products and thus helps in global food and agriculture industries to ensure safety and quality improvement and regulatory risks associated with Food products are being analyzed for various reasons for eg;Compliance with legal and labelling requirements, assessment of product quality, Determination of Nutritive value, detection of adultrants,Research and Development .In conclusion different food testing techniques used in chemical analysis of food products ensures the safety ,Nutritive value of the food which is being consumed without any dilemma.

SME-120

Generation of plastic waste and its consequence on society

Venu Chaudhary, Gaurav Sharma and N. Tyagi
Deptt. of Physics, NAS college, Meerut, Utter Pradesh-India
School of Physics and Mathematics, Central University of Haryana, Mahendragarh

Due to rapid population growth, urbanization and industrial growth have led to the severe problem of plastic wastes generation in an urban area. The wastes quantities have increased from a few million tons to ~960 million tons from 2011-2018. As we know, the process of reuse and recycle this plastic is very drawn-out. In the past few years, scientific communities have been trying to find out the innovative idea to dispose of the plastic waste from the society. The government has also banned the use the plastic in many states in India. Still, the garbage of plastic is an alarming condition to the next generation, which directly affects human health and the environment. Hence, the characteristics of this waste depend on various factors such as food habits, traditions, lifestyle, climate etc.

SME-121

SSR and ISSR Markers for Genetic Assessment of Drought Tolerance in Rice (*Oryza sativa* L.)

Abhinay Singh, Swati Ahlawat, Varun Saxena, Neelesh Kapoor, Rekha Dixit and Anil Sirohi
College of Biotechnology, Sardar Vallabhbhai Patel University of Ag. & Tech., Meerut, U.P.
E-mail: drneeleshbiotech@gmail.com

Plant growth and productivity of rice (*Oryza sativa L.*) is significantly affected by numerous biotic and abiotic stress inducing factors. Water deficit is regarded as one of the major abiotic stresses that adversely affect growth and yield of this crop. The situation becomes alarming at global level. Increase in world population will further increase the severity. Drought stress is a restrictive factor for agricultural crops, preventing them from attaining highest theoretical yield as determined by genetic factors. In plants, development of new varieties having high yield and better performance under water stress environment, demands the suitable understanding of their genetic basis. This abstract describes some major characteristics of water deficit induced effect of drought stress on biological yield and its related traits in species of rice. Molecular marker technology is an advance approach leading to screening of varieties against such stresses. With the help of various markers such as ISSR and SSR we can identify these drought tolerant genes in rice.

SME-122

Studies on the Degradation of Polythene by Microbial and Enzymatic Methods

Akansha Kushwaha, Priya Tyagi
Deptt. of Biosciences, Shri Ram College Muzaffarnagar, UP-251001, India.
E-mail: akanshakushwaha1993@gmail.com

Polythene is extremely important to the job market thought-out the world that makes easy transports of a wide range of food, drinks and other goods. Polythene is generally non-biodegradable hence they may take centuries to decay. This is due to intermolecular bond that constitute plastic whose structure ensures that the plastic neither corroden or decompose. Five sample of Polythene were taken PO1, PO2, PO3, PO4, PO5 and 5 samples of soils was also taken from different area. Enzymatic solution TEZ and OEZ was taken. NAM and CDA was used for growth of bacterial and fungal colony. The different sample of Polythene was incubated in the different concentration of TEZ and OEZ for 40 days. Sample PO5 was found maximum degraded with the help of enzymatic solution TEZ 100, while in case of OEZ sample PO5 in OEZ 10 was found to be degraded maximum content of Polythene. In case of distilled water sample PO4 was found to degrade maximum. Sample PO3 was found maximum degraded with the help of NAM. While in the case of CDA the maximum degradation of plastic sample PO5. The microbial effect on Polythene was observed with the surface of material was turned from smooth to rough. This may be possible due to presence of certain compound secreted extra cellular by microbes that may break the complex molecules of Polythene. The degradation of Polythene was compared by the weight loss of sample inside the soil and with the media in the laboratory.

SME-123

Climate-Smart Agriculture Techniques in India

Akansha Kushwaha, Dr. Ashwani Kumar, Anushree Choudhary
Deptt. of Biosciences, Shri Ram College Muzaffarnagar, UP-251001, India.
E-mail: akanshakushwaha1993@gmail.com

Agriculture is the broadest economic sector and plays an important role in the overall economic development of a nation. Smart farming is a management concept focused on providing the agricultural industry with the infrastructure to leverage advanced technology – including big data, the cloud and the internet of things – for tracking, monitoring, automating and analyzing operations. The smart farming is a modern farming concept under which the internet, soil scanning, data management is used for increase in production. Climate-smart agriculture (CSA) is an integrated approach to managing landscapes to help adapt agricultural methods, livestock and crops to the ongoing human-induced climate change. Smart Farming is a farming management concept using modern technology to increase the quantity and quality of agricultural products. Smart agriculture is a

revolution in the agriculture industry that helps to guide actions required to modify and reorient agricultural systems to effectively support the development and guarantee food security during an ever-changing climate. There are several modern and sustainable ways of doing productive farming; some of the modern climate smart farming techniques are: organic fertilizers, mixed cropping culture, Use of modern irrigation technologies and integrated pest management.

SME-124

Cell Viability Evaluation of Colloidal Beam UV-C Irradiated Coconut Water

Amita Banga[1,2], Pendyala Brahmaiah[2], Amar P Garg[1], Ankit Patras[2].
[1]Shobhit Institute of Engineering & Technology (Deemed to-be university) Meerut
[2]Tennessee State University, United States

Coconut water (CW) consumption is in explosive growth in the years, where by 2024, the market is about to reach 2.08 billion dollars in the United States. The fresh CW is sterile and free of infectious pathogens; CW is processed to inhibit the microbial growth and contamination with microbes like Salmonella enterica, Bacillus cereus, Listeria monocytogenes and Staphylococcus aureus. The HACCP rules implemented by the US-FDA for the sterilization of the fruit juice processing. Thermal pasteurization and High-Temperature Short-Time (HTST) pasteurization process are well-adopted techniques to safe from pathogenic microbes and enhancing the shelf-life of CW products but bring about considerable changes in nutritional content of the juices. UV-C treatment has evolved as one of the novel non-thermal technologies to control pathogens and do not produce non-toxic by-products or alter the nutritional content during treatment. In this study we are evaluating the irradiated CW does not alter the cell viability when treated onto various cell lines. The collimated beam UV system used for irradiating the Coconut Water. A UV fluence delivered to CW was ranging from 0, 100,200, 400 and 800 $mJ.cm^{-2}$. The treated CW was used to test on Human Colon fibroblast cell lines (CCD-18Co) and Human vascular endothelial (EAhy926) by maintaining in EMEM and DMEM media respectively. pH of the media was checked after adding the CW and treatment volume was optimized by adding various concentrations of treated CW. Effect of CW on cell lines were determined by using Cell proliferation and cytotoxicity assays using CCK8 cell counting assay kit. Various dilutions results showed that dilutions of 1.5, 2.5 and 5% volume/volume of coconut water to cell culture media has shown no toxicity to the cells and addition of coconut water hasn't changed the pH of the media. Addition of treated CW with various dose of UV-C (100, 200, 400, 800 mJ/cm^2) for 12, 24, 36 and 48 hours did not cause any significant modification in cell proliferation or cytotoxicity in CCD-18Co and EAhy926 cells. UV-C irradiation inactivates the microbial and viral populations in coconut water using a colloidal UV beam. UV-C treatment of CW did not change the cellular viability in Colon and endothelial cells. These results suggest that UV-C treatment didn't generate any cytotoxic compounds in the coconut water.

SME-125

Air pollution: Effects on Health and its Preventive Measures

Anuj Kumar, Sandeep Kumar, Rupesh Kumar and Maya Datt Joshi
Deptt. of Biotechnology, Shobhit Institute of Engineering & Technology (Deemed to be University), Meerut
E-mail: akanujkumar98@gmail.com

Air pollution is one of the world's largest health and environmental problems. It develops in two contexts: indoor (household) air pollution and outdoor air pollution. Air pollution is responsible for many health problems in the City areas. Of late, the air pollution status in Delhi has undergone many changes in terms of the levels of pollutants and the control measures taken to reduce them. This paper provides an evidence-based insight into the status of air pollution in Delhi and its effects on health and control measures instituted. The PM 10 standard is generally used to measure air quality. The PM 10 standard includes particles with a diameter of 10 μm or less (0.0004 inches or one-seventh the width of a human hair). These small particles are likely to be responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract. According to the Air Quality Guideline by the World Health Organization, the annual mean concentration recommended for PM 10 was 20 μg/m3, beyond which the risk for cardiopulmonary health effects are seen to increase.

SME-126

Zero -Budget Natural Farming - A New Dimension for Sustainable Agriculture

Deepak Kumar[1], Rakesh Kumar[2], Ranjeet Singh Bochalya[1] Ashok Kumar Gupta[1] and Vimal Kumar Naga[2]
[1]Division of Agronomy, FoA, Sher-e-Kashmir University of Agricultural Sci. and Tech Jammu
[2]Division of Vegetable science & Floriculture, FoA, Sher-e-Kashmir University of Agricultural Sciences and Technology-Jammu
E-mail: pandeyagronomy@gmail.com

Using conventional techniques in agriculture leads to deterioration of soil fertility index and thereby affects the human health. It does not only make the soil barren but eventually, the farmer goes under debt. Hence, the only way to deal with this ever rising problem is Zero Budget Natural Farming (ZBNF). The word 'budget 'refers to credit and expenses, thus the phrase 'Zero Budget' means without using any credit, and without spending a little penny on purchased inputs. 'Natural farming' means farming with nature without chemicals. Subhash Palekar, the pioneer of ZBNF, gave many theories, principles and methods of ZBNF. Zero budget farmers use mulching, soil protection techniques, natural pesticides and fertilizers. The principal methods of ZBNF include crop rotation, green manures and compost, biological pest control, and mechanical cultivation. Popularly, there are 4 pillars of ZBNF i.e. Jivamrita, Bijamrita, Acchadana Whapasa. Zero Budget Natural Farming, which is in sync with the principles of

agro ecology and also with other knowledge systems seem to show a way out through its application by farmers' initiative in Karnataka and Andhra Pradesh. Zero Budget Natural Farming works not just in agronomic terms, but also brings about a variety of social and economic benefits. A majority of respondents reported that by adopting ZBNF, overtime they saw improvements in yield, soil conservation, seed diversity, quality of produce, household food autonomy, income, and health. Although the economic yield in treatments comprised of ZBNF inputs was lower but their low cost of cultivation makes these treatments comparable with other treatments in terms of benefit - cost ratio.

SME-127

In vitro Oxidative Modification of Lipoproteins isolated from Normal Subjects Plasma, Pretreated with Tocopherol and Tocotrienols

Amir Khan
Basic Oral Medicine and Allied Dental Sciences Deptt., college of dentistry, Taif University, Al- Taif, Makkah, Kingdom of Saudi Arabia.
E-mail: amirkhan@tudent.edu.sa

Cardiovascular diseases (CVD) is considered to be one of the most progressing diseases in the population in the coming years in the world. Oxidized LDL (Ox-LDL) are known to promote atherogenesis through foam cell formation and inflammatory responses. The process involves receptor-mediated endocytosis of Ox-LDL which leads to lipid accumulation and vascular cell dysfunction including induction of apoptosis which represents major cause of plaque growth and rupture. As an antioxidant, vitamin E acts as a peroxyl radical scavenger, preventing the propagation of free radicals in tissues, by reacting with them to form a tocopheryl radical, which will then be reduced by a hydrogen donor (such as vitamin C) and thus return to its reduced state. As it is fat-soluble, it is incorporated into cell membranes, which protects them from oxidative damage. The anti-oxidant impact of α-tocopherol and tocotrienol on Copper mediated in vitro oxidation of LDL was analysed in this study by incubating plasma with α-tocopherol and tocotrienol for an hour. Both α-tocopherol and tocotrienol showed a significant decrease in Conjugate diene, Lipid hyderoperoxides and TBARS formation. However tocotrienol proved to be more potent than α-tocopherol. A decrease of 5.63% and 4.61% was observed in CD formation during LDL oxidation on the addition of tocotrienol and α-tocopherol respectively. Similarly, LHPO formation also reduced by 47.04% and 32.64% and TBARS formation by 6.13% and 4.12% on the addition of tocotrienol and α-tocopherol respectively. In case of oxidation of more atherogenic and a strong and independent predictor of CVD, sd-LDL, this decrease was found to be 5.72 % ,50.31% and 5.85% when Tocotrienol was added and 2.82%, 37.78% and 3.24% when α-Tocopherol was added in CD, LHPO and TBARS formation respectively. Similar kind of results were obtained when Tocotrienol and α-Tocopherol were added during lb-LDL oxidation. Key words: α-Tocopherol, Tocotrienol, LDL Oxidation, CVD.

SME-128

Diseases as a Major Constraints in Doubling Sugarcane Farmers Income

Ram Ji Lal
Ex. Principal Scientist & HOD Division of Crop Protection
ICAR-Indian Institute of Sugarcane Research, Lucknow-226 002
E-mail: lalramji054@gmail.com

Sugarcane (*Saccharum* spp. hybrid) is the second most important commercial crop grown in India. It is grown in about 5 million hectares in both tropical and sub-tropical regions covering 3% of total cultivated area of the country. Globally, India occupies second largest sugarcane producing country, next to Brazil. A wide range of products have been developed from sugarcane viz., sugar, *jaggery* (*Gur*), brown sugar (*khandsari*) besides various bio-products, like bagasse (used as fuel and co-generation of electricity, compressed fiber board, paper, plastics etc.,) and molasses (used in distilleries for manufacturing of ethyl alcohol, ethanol, butyl alcohol, citric acid), press mud cake for soil amendment in saline and alkaline soils. About 8 million farmers of the country are engaged in cultivation of this crop. It is estimated that by 2030 AD, the country will require around 520 million tons of sugarcane for the production of 33 million tons of white sugar for domestic consumption with a recovery of 10.75%. This will entail an increase in sugarcane productivity to the tune of 100 to 110 t/ha, as area may stabilize around 5.0 million hectares. The major factors responsible for low cane productivity are (i) Degradation of natural resources (ii) Higher cost of cultivation (iii) Inadequate irrigation facilities (iv) Excessive and untimely use of irrigation water (v) Replacement of a rich traditional varieties with high yielding varieties (vi) Breakdown of resistance of varieties to insect-pests and diseases, and (vii) Climate change and other natural calamities etc. Sugarcane is vulnerable to number of diseases right from the seed/sett is sown until the crop is harvested. The diseases alone cause about 15-20% loss in yield and quality and are major constraints for reduction in cane productivity and sugar recovery. Sugarcane diseases can be classified in two categories (a) Seed piece transmissible diseases (Red rot, wilt, smut, leaf scald, grassy shoot disease, ratoon stunting disease, mosaic and yellow leaf disease), and (b) Non-seed piece transmissible diseases, like *Pythium* root rot, leaf spots, pine apple, rust and nematode diseases etc. Both growers and millers suffer due to incidence of diseases. The growers suffer due to reduction in no. of millable canes and yield, poor quality seed and ratoon stand, while millers suffer on account of poor juice extractability, more reducing sugars besides reduction in sugar recovery. Among the various diseases, the most important diseases like red rot (*Colletotrichum falcatum)* Went, smut *(Sporisorium scitamineum),* wilt *(Fusarium sacchari) and pokkah boeng (Fusarium moniliformae)* cause serious threat to cane cultivation and are responsible for elimination of many elite cane varieties in the past. In addition, many foliar diseases along with the diseases caused by viruses (mosaic), bacteria (top rot/red stripe, leaf scald and ratoon stunting) and phytoplasma (grassy shoot, yellow leaf disease) also cause serious damage to the crop. Therefore, the cane farmers are advised to follow recommended Integrated Disease Management (IDM) practices *viz.*, selection of field/land, use of healthy seed material (thermotherapy/three tier seed programme), quarantine, field sanitation (rouging), crop diversification (Crop rotation/inter cropping), chemotherapy, genetic manipulation (use of high yielding disease resistant varieties), serological methods (ELISA and tissue blot techniques to detect pathogens),

molecular techniques *viz.*, Polymerase Chain Reaction (PCR), nested PCR, (RT)-PCR (to detect viruses and phytoplasma), meristmatic culture (to produce virus and phytoplasma free planting settlings) and biological control for doubling their income.

.

SME-129

Encouraging Entrepreneurship and its impact on Economic Development in Emerging Economy and Characteristics influence for Entrepreneurship behaviour ability

Dr. Manoj Kumar[1] and Dr. R. N. Yadav[2]
[1]College of Agriculture Science, Teerthanker Mahaveer University Moradabad.
[2]Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut.
E-mail: *manojkumarrajput1988@gmail.com*

Entrepreneurial activities create incremental wealth, which is a precondition to economic growth. Entrepreneurship nowadays is universally recognized as critical resource in the economic development process of a country. The study highlights the impact of encouraging entrepreneurship on economic development in emerging economy. The fact that entrepreneurial ability is a cultivable asset, the supply of which can be generated and enhanced through education, training and opportune economic climate, has forced the attention of policy makers and planners towards entrepreneurship as the desirable and manageable route to economic development. It is widely acknowledged that entrepreneurship is critical to the development of knowledge-based economy. Moreover, the given recommendations would be helpful to the practitioners, researchers, planners, policy makers and academicians, who are involved in the development of entrepreneurship. Globalization and liberalization of markets encouraged women to come forward to become entrepreneurs and start new industries In this regard both state and central governments have taken initiatives in developing women entrepreneurs in India. The first reason is that women's entrepreneurship in an important untapped source of economic growth. The second reason is that the women entrepreneurs create new jobs for themselves and others. Empirical studies show that women contribute significantly to the running of family business mostly in the form of unpaid effort and skills.

SME-130

Performance and adoption of garden pea intercropping with autumn planted sugarcane through Front Line Demonstrations: A step towards doubling farmer's income

Naveen Chandra, Virendra Pal and Omveer Singh
Krishi Vigyan Kendra, Hastinapur, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut- 250110 (Uttar Pradesh)

Intercropping refers to growing of two or more crops simultaneously on the same piece of land with adefinite row planting pattern to obtain higher productivity per unit area and time. Rapidly increasing population, increasing demand for food, limited scope for extension of cultivation to new areas, diversified needs of small farmers for food and cash etc. have necessitated the adoption of intercropping systems. In long duration crops like sugarcane, intercropping holds much promise. Due to slow establishment of sugarcane during the first 85 to 120 days, the greatest scope for complementary effect lies in the addition of annual intercrops to the temporal system to improve resource use efficiency in the early crop growth. Intercropping offers an opportunity for profitable utilization of available land space. Sugarcane growers take advantages of this and grow various short duration crops like garden pea intercrops to obtain interim return. The system of sugarcane + garden pea produced higher B:C ratio of 1: 1.82 and with Rs. 62780.00 more net income. The garden pea as intercrops with autumn sugarcane improves the yield. Due to legume intercrops in cropping system enhance soil fertility through the excretion of amino acid into the rhizosphres. The nitrogen fixed by the legume intercrop may be available to the associated sugarcane in the current season itself.

SME-131

Role of Modernization Technology: Relevance in Present Era

Poonam and Dr. Aditi Vats
Deptt. of Family Resource Management, College of Home Science, G.B.P.U. A & T. Pantnagar
Email: poonam.singh0111@gmail.com

The farm women performing all the agricultural tasks with the traditional tools and methods, they are not women friendly appropriate tools or either not available or are insufficient in number or unawareness. Unsafe, hazardous, unhealthy and long hours of work with traditional and awkward postures accelerate health related problems, especially among farm women. Most of the works performed by farm women are tedious as well as time consuming. As most of these operations like weeding, harvesting, digging, seed separation from pods, winnowing, threshing, seed shelling, cleaning and preparation etc. are done manually or by traditional tools, which are slow and cause considerable fatigue and drudgery. Many of these operations are traditionally done in varying body postures, some of which if done for long duration are not only inconvenient but also cause serious health hazards. All

these factors result in drudgery by causing physical and mental fatigue, monetary hardships, exploitation, pain, economic stress etc. Majority of the respondents perceived farm activities as either moderately difficult. The present study was done to improved farm tools for farm women to increase productivity and reduce drudgery in Udham Singh Nagar district of Uttarakhand. Data was gathered from 200 farm women through a well structured questionnaire, focused group discussion and personal interview method. Finding revealed that farmwomen used traditional tools and implements since a long time but most of the women farmers felt immense drudgery in their use. It was also found that most of the farm women were unaware of improved farm tools and implement which reduce drudgery. The present study also revealed that most of the respondents used traditional tools and implements since a long time and subsequently 77.50 % of respondents were also faced difficulties and problem in using traditional tools and implements. Maximum 86.66 present of rural farm women engaged in cutting and load carrying activities. They are however subsequently exposed to prone drudgery activities. This result implies that the respondents were least aware about improved or women friendly drudgery reducing tools.

SME-132

Speed Breeding: A Unique Approach in Biennial Vegetable Improvement

Rakesh Kumar[1], Deepak Kumar[2], Sachin S Chikkeri[1] and Vimal Kumar Naga[1]
[1] Division of Vegetable Science and Floriculture, SKUAST, Jammu
[2]Division of Agronomy, SKUAST, Jammu

Reducing the release time of new varieties is a key objective of any breeding programme. Recent use of winter breeding and seed increase nurseries has significantly reduced release times. Despite these improvements, full-season maturity cultivars are still limited to two generations in a calendar year, when grown under optimal environmental conditions. Speed breeding technique combines controlled environment conditions, continuous light in conjunction with optimal temperature, and a single seed descent breeding strategy in a greenhouse environment. Speed breeding was successful in reducing generation time of full-season maturity cultivars till half of main growing period. Speed breeding under fully enclosed, controlled-environment growth chambers can accelerate plant development for research purposes, including phenotyping of adult plant traits, mutant studies and transformation. The use of supplemental lighting in a glasshouse environment allows rapid generation cycling through single seed descent (SSD) and potential for adaptation to larger-scale crop improvement programs. Cost saving through light-emitting diode (LED) supplemental lighting is also utilized. Integration of speed breeding with other modern crop breeding technologies like high-throughput genotyping, genome editing and genomic selection will accelerate the rate of crop improvement. With the application of genomic in situ hybridization (GISH) and previously developed DMR1 marker, homozygous introgression lines, resistant to downy mildew were successfully produced in a rather short breeding time in onion.

SME-133

Genes to Drug: An *in-silico* approach to design a drug for Huntington disease (HD) in *Homo sapiens*

Sachin Kumar[1], Manoj Kumar Sharma[1], Shivalika Panwar[1] and Manoj Kumar Sharma[2]
[1]Deptt. of Bioinformatics, Janta Vedic College, Baraut, (Uttar Pradesh), India
[2]Deptt. of Botany, Janta Vedic College, Baraut, (Uttar Pradesh), India
Email: sachinsuryan@gmail.com

Huntington's disease (HD) is a progressive neurodegenerative disorder. It is an autosomal dominant disorder that is categorized by motor dysfunctions, behavioral and cognitive deficits. Till now there is no definitive treatment for HD. Conventional drug discovery involve a time-consuming process that involve high cost. In this scenario the current study is carried out using *in silico* approach to find some potent drug molecule against Huntington's disease. Mutant Huntingtin protein (HTT), HTT-interacting protein 1 (HIP-1) were used as the target protein for the drug designing. Swiss PDB Viewer (SPDBW) was used for active site determination. Ligands were prepared through Molinspiration Cheminformatics following Lipinski rule of five (RO_5). Bioinformatics software Molegro Virtual Docker (MVD) and HEX were used for docking between the ligands and target proteins. Eleven ligands were prepared and compared with drugs based on MolDock score and hydrogen bond score. Four ligands - named [1-benzyl-6bromo-8-((4-ethyl-2hydroxy-2*H*-pyran-6y1)methyl)-4-hydroxy-7,8dihydro-1,8 naphthydrin-2(1*H*)-one],[4-((3-amino-5bromocyclohexyl)methoxy)-5-butyl 6hydroxydechydronaphthalene-2-carboxylicacid],[3-amino-2-chloro-13-(2-hydroxybutyl)-5-nitro-2,3-dihydro-*7H* benzo [*c*] [1,4] dioxino[2,3-*h*]xanthen-7-one] and [3-(3'-bromo-[1,1'-bi(cyclohexan)]-3-y1)-6-(4-methoxy-4-oxobutanamido)hexanoic acid] respectively with most appropriate values as -731.31 for MolDock score and -33.51 for H-Bond score are found to be potential drug candidate for Huntington's Disease.

SME-134

Glycosyl hydrolases Producing Microorganisms for Agricultural Biomass Valorization

Meenal Rastogi[1], Smriti Shrivastava[1], Pratyoosh Shukla[2]
[1]Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida-201313, U.P., India
[2]Deptt. of Microbiology, Maharshi Dayanand University, Rohtak, Haryana, India
E-mail: sshrivastava1@amity.edu

Lignocellulosic biomasses are deliberated as most attractive sources for bioenergy production. They comprise of celluloses and hemicelluloses which can be effectively depolymerized and hydrolyzed to fermentable sugars using diverse microbial enzymes, for subsequent conversion to various value added products. Present study reports the isolation, screening and identification of various microorganisms producing glycoside hydrolases of industrial importance. In this study, indigenous cellulolytic and xylanolytic microorganisms were isolated from different waste samples at a range of temperature from

30-60°C. Amongst 294 morphologically different strains, 40 strains were further analyzed quantitatively using enriched media containing salts and nitrogen source supplemented with Whatman filter paper and corn cob for screening of cellulolytic and xylanolytic microbes, respectively. Four fungal xylanolytic isolates, were finally selected after several rounds of screening. They were identified as *Aspergillus sp.* based on ITS region sequencing. These isolates could effectively degrade agricultural residues with maximum xylanase activity within the range of 14.4 - 26.3 IU/ml when working as singlet. A consortium of these microbial sources is likely to enhance saccharification of agricultural wastes through maximal enzyme production.

SME-135

Probiotic Potential, Antimicrobial and Antioxidant Activities of *Enterococcus hirae* Isolated from Goat Milk

Kamni Rajput and Ramesh Chandra Dubey
Deptt. of Botany and Microbiology, Gurukula Kangri Vishwavidyalaya, Haridwar, India

Present study documents the potential probiotic *Enterococcus hirae* isolated from indigenous raw goat milk. A total of 43 isolates of the lactic acid bacteria isolated from 15 samples of indigenous raw goat milk were investigated for their probiotic potential and safety parameters. On the basis of certain parameters viz., low pH, bile salts and phenol resistance. These isolates were further evaluated antioxidant, antimicrobial activities and antibiotic resistance. In addition, lack of gelatinase and hemolytic activity supports its safety as probiotic traits. The isolate G24 showed the good viability at different pH, bile concentration and phenol resistance but it did not show gelatinase and hemolytic activities. Isolate G24 was susceptible to antibiotics and displayed antimicrobial activity against five pathogenic bacteria, such as *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Listeria monocytogens* and *Salmonella typhimurium.* It exhibited the antioxidant activity. Following molecular characterization, the isolate G24 was identified as *Enterococcus hirae* by using 16S rRNA gene sequencing and phylogeny. *E. hirae* G24 bears the excellent properties to be used as probiotics.

SME-136

Evaluation of Solar & Electric Irrigation System in Kinnow Orchard of Rajasthan

N K Meena[1] Ram Singh[2] and H L Singh[1]
[1] Deptt. of Agricultural economics, College of Agriculture, SVPUA&T, Meerut-250110, U.P.
[2] Deptt. of Agricultural Economics, CPGSAS, CAU (I), Umiam-793103, Meghalaya.
E-mail: narendrameena090@gmail.com

This study attempted to evaluate the money making efficiency, economic viability and life cycle cost comparison of solar powered irrigation system against electric irrigation system in kinnow orchards of

Rajasthan. The three-year socio-economic study was conducted in Sri-Ganganagar and Bikaner district of Rajasthan by interviewing 200 respondents (160, solar adopter and 40 non solar adopter) by using pre-tested interview schedule. To check the economic viability and cost comparison of solar and electric system standard methodology were applied to assess comparative advantages of Photo Voltaic (PV) solar device for irrigation of kinnow orchard. It was observed from the investigation that solar irrigation system was cost effective and economically more viable compared to electric irrigation systems in terms life cycle cost (solar:₹81095, electric: ₹588600), net present worth (solar: ₹842521, electric ₹798964), pay-back period (solar: 7.1 year, electric 7.2 year), break-even point (solar: 5.15 ton, electric 5.04 ton), and BC-ratio (solar: 2.36, electric 2.23). It may be due to the merit of solar system which using energy from sun rays and no need of fuel and electricity to pump the water and less expenditure required on repair & maintenance of this solar irrigation system. Further it concludes that solar irrigation system was found to be most efficient system of irrigation which enhanced the returns of farm and played a partial catalyst role to enhance the income of the farm. Therefore, the economic as well as environment benefits need to realize for popularization the solar device for betterment of farming society which would reduce the dependency on electricity of farmers for irrigation specially and other works depend on electricity generally. Hence, provision of incentives on solar devices should be made to the farmers.

SME-137

Resource Conservation Technology for Sustainability of Rice-Wheat Cropping System

Rajendra Kumar, Rahul Kumar, M. S. Chandra and Reenu Kumar
Deptt. of Agronomy; Sardar Vallabhbhai Patel University of Agriculture & Technology
Meerut (U.P.) - 250110
E-mail: rajdiwakar1990@gmail.com

Rice-wheat (RW) is the most important cropping system for food security in South Asia, providing food for more than 400 million people. In India, this system contributes 26% of total cereal production and 60% of total calorie intake and about 40% of the country's total food basket. The area under the RW system covers around 32 and 42% of total rice and wheat area, respectively. The productivity and sustainability of the system are threatened because of the inefficiency of current production practices, shortage of resources and socioeconomic changes. Conservation Agriculture (CA) offers an opportunity for arresting and reversing downward spiral of resource degradation, minimizing the cost of cultivation and making agriculture more resource-use-efficient, competitive and sustainable for better health. Resource Conservation Technology (RCT) improved the growth, yield attributing characters, yield and water use efficiency over conventional practices in rice-wheat cropping system. However, it also fetched more economic return with per Rs investment. Precision nutrients management and soil test crop response (STCR) based application of nutrients improved the nutrient use efficiency and produced more economic yield as compared to the application of recommended dose of fertilizers. This

technology revolution is seen as one way to sustainably increase food production to meet future demands while conserving natural resources and reducing the negative effects on the environment.

SME-138

Development of Functional Rasogolla Using Chhana from Soya Fortified Milk

Rajni Kant[1], Gaurav Yadav[2], B. K. Bharati[3], P. P. Srivastav[1], and A. K. Datta[1]
[1]Agricultural and Food Engineering Deptt., Indian Institute of Technology Kharagpur-721302
[2]Shobhit Institute of Engineering and Technology, Meerut and Sam Higginbottom University of Agriculture, Technology and Science, Allahabad
E-mail: drrajnikant.fdt@gmail.com

Foods which promote health beyond providing basic nutrition are termed as "functional foods". It refers to a food that has been modified or value-added. Significant strategy in the development of functional foods evolves increasing the levels of specific neutraceuticals that are known as health benefits. This can be through enhancement of levels of the desired component that is inherent in the food of by fortification of food products with functional ingredients, such as dietary fibres, antioxidants, natural isoflavones, plant sterols/stanols, other phytochemicals or phytonutrientvs, bioactive peptides, w-3, -6 PUFA, probiotics, prebiotics, minerals and vitamins etc. Rasogolla regarded as the king of Indian milk-sweets, is prepared by texturization of kneaded-chhana balls under controlled cooking in boiling sugar syrup. In appearance, it is a snow-white, soft and succulent sphere (resembling ping-pong balls) dipped in sugar syrup. Soya milk is rich in isoflavones. Five different ratio Cow milk and Soya milk i.e. 100:0; 50:50, 60:40, 70:30 & 80:20 were used for making chhana and three different levels of maida were used in the present experimental work. Functional Rasogolla prepared from different treatment combinations were compared with each other. Studies will be conducted to determine the suitability of given Functional Rasogolla prepared from soya fortified milk. Studies will be conducted to determine the chemical analysis of Functional Rasogolla made from soya fortified milk like: Fat, Protein, Carbohydrate, Enzyme (Lipase), Total solid, Acidity and Ash were estimated by using standard procedure laid down in Manual in Dairy Chemistry ICAR (1972). Studies will be conducted to determine the microbial analysis of paneer made from cow milk and buffalo milk like: Standard Plate Count, Coliform count and Yeast and Mould were estimated by using standard procedure laid down in IS: 1847 (Part 2) and Manual of Dairy Bacteriology, I. C. M. R. Publication (2972). Studies will be conducted to determine the Textural analysis of paneer by Textural analyzer INSTRON UNIVERSAL TESTING machine. The products developed were subjected to sensory evaluation by a panel of five judges. The evaluation of the product was carried out by using the-9 point Hedonic scale Srilakshmi, (2008). Isoflavones have many health benefits including reduction of cholesterol, easing of menopause symptoms, prevention of osteoporosis and reduction of risk for certain cancers (prostate cancer and breast cancer). Isoflavones are also antioxidants which protect our cells and DNA against oxidation. Soybean products also have protective properties against breast, prostate, colon and lung cancers because of the isoflavones content. It will be helpful for people suffering from protein energy malnutrition also because this product is rich in protein and energy.

SME-139

Underground Root Engineering for Value Addition to Medicinal Plants

Ram Prasad[1] and Ajit Varma[2]
[1] Deptt. of Botany, Mahatma Gandhi Central University, Motihari-845401, Bihar, India
[2]Amity Institute of Microbial Technology, Amity University Uttar Pradesh, Sector-125, Noida
E-mail: rpjnu2001@gmail.com

Serendipita indica is a wide-host root-colonizing endophytic fungus has been isolated from the rhizosphere soils of the woody shrubs *Prosopis juliflora* and *Zizyphus nummularia* from the sandy desert soils of North-West Rajasthan, India. It has a typical pear-shaped chlamydospore and belongs to the newly formed order Sebacinales of Basidiomycota. The size of *S. indica* genome is 24.97Mb having 1884 scaffolds and 2359 contigs. The fungus can be cultivated on complex and minimal media. Association of *S. indica* with host plants provides several beneficial impacts to the host plant such as biofertilizer, bioprotector, bioregulator, bioherbicide/weedicide, combats environmental stresses, nutrient uptake, plants to survive under water, temperature and salt stress, systemic resistance to toxins, heavy metal ions and pathogenic organisms, stimulates growth and seed production and an excellent source for the hardening of the tissue-culture raised plants. *S. indica* tremendously improves the growth development, overall biomass production of a large number of plants with economic importance. Pronounced growth promotional effect was also seen with terrestrial orchids. The fungus promises to be a potential orchid mycorrhizal fungus. The medicinal plants tested viz., *Bacopa monniera, Azadirachta indica Tridex procumbans, Abrus precatorius, Withania somnifera, Chlorophytum borivilianum, Ocicum sanctum, Spilanthes calva, Artemisia annua* and *Coleus forskohli*. The tested plants were promoted as a result of early intervention with endophytic fungus. Studies have also revealed that the fungus also helps in better survival and establishment of tissue culture raised plants (agent for biological hardening). Interaction of *S. indica* (biomass and/or the culture filtrate) with *Artemisia annua* have shown considerable enhancement in total biomass and 2.5-fold increase in artemisinin production both in micro-propagation plants and cell culture systems was recorded.

The fungus has great potential for application in agro-forestry, flori-horticulture, arboriculture and especially for better establishment of tissue culture raised plants- much needed for the application in plant industry. The increasing interest in this fungus worldwide will lead to novel information that will disclose potential agronomical and biotechnological applications.

SME-140

Sediment Outflow from Maize and Marigold Crop under Simulated Rainfall at Selected Land Slopes

Sachin Kumar Singh and Akhilesh Kumar
Deptt. of Soil and Water Conservation Engineering, College of Technology, G. B. Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand, India.
E-mail: sachinkumar88gzb@gmail.com.

Crop canopy cover is very effective to prevent soil erosion as well as runoff. In this present study, a field experiment was conduct to reduce soil loss and runoff with maze and marigold crop treatment under simulated rainfall condition. This study was conducted under controlled conditions using a rainfall simulator and experimental plots. The experimental set-up basically includes a portable rainfall simulator of 3.4 m × 1.4 m size for generating simulated rainfall and five number of experimental plots of 3 m × 1 m size. Maize and marigold crop, three rainfall intensities viz. 3.77cm/h, 8.82cm/h and 12.73cm/h and five land slopes 0%, 2%, 4%, 8% and 12 % were selected. The duration of rainfall was fixed for 10 minutes for each treatment. The total runoff volume was found to be varying with different land slopes for particular rainfall input. The average sediment concentration and outflow was found to be increasing with the increase in land slope, but sediment concentration and outflow decreased with maize and marigold crop for particular land slope and rainfall intensity. The sediment outflow rate for barren land was higher as compared maize and marigold treated lands. Finally, marigold crop canopy cover was more effective to control sediment outflow as compare to maize crop canopy cover.

SME-141

Land Use Land Cover Change Detection Using Maximum Likelihood Classification Algorithm

Sanjay Tewari, Vinod Kumar and Harish Chandra Sharma
Irrigation & Drainage Engineering, College of Technology, GBPUAT, Pantnagar

The present study was conducted for Champawat district of Uttarakand. The area comprises of 107.9 km^2. Landsat7-ETM images E07_L1TP_145040_20070327_20170104_01_T1 and LE07_L1TP_145040_20070428_20170103_01_T1 (used for gap filling) and Landsat8-OLI/TIRS image LC08_L1TP_145040_20170330_20170414_01_T1 were downloaded from USGS archive using Earth Explorer. Environment for Visualizing Images (ENVI) software was used to detect decadal change in land use over a period 2007-17 and supervised classification was performed using maximum likelihood classification algorithm. Ground truthing was conducted at study area to input as training pixels. The area was classified into four land use land cover (LULC) classes i.e. built-up, agriculture,

forest and barren. The class statistics of maximum likelihood classified images for the year 2007 and 2017 revealed an increase of 1.32 % in built-up and 7.44 % in agriculture. Also, area under forest cover increased by 1.42 % and there was a decrease of 10.18 % in barren land over the decade.

SME-142

Growers' Friendly Techno-Package against Root Diseases of Okra Posing Serious Threat in and Around Western U.P.

Archana Singh
School of Sciences
Department of Agriculture
Noida International University, Greater Noida, Uttar Pradesh
E-mail: archana.singh@niu.edu.in

In the present study an attempt has been made to manage the major soil borne maladies using eco-friendly and safe practice as against the toxic and expensive chemical means being practiced by majority of farmers of western U.P. In this, through extensive surveys around vegetable growing area, heavy infestation of root knot nematode and root rot fungus was recorded on okra resulting remarkable damage to the crop. The management of the above maladies has been carried out through integrated approach of neem oil seed cake, fungal bio agents viz. *Trichoderma harzianum* and AM fungus *Glomus etunicatum* on okra, the host plant being grown as main vegetable in the region. *In vitro* studies with fungal bioagents against pathogenic fungus and root knot nematode clearly showed a high mycoparasitic nature of *T. harzianum* against *R. solani* while remarkably high egg parasitic nature against root knot nematode, *Meloidogyne incognita*. The results of pot culture/glass house studies on okra cv. *Arka anamika* carried out with safe and cost effective management components showed outstanding results in respect to plant biomass and also reducing incidence of rot fungus *R. solani* with significant reduction of both root and soil population of *M. incognita* as compared to all other treatments including uninoculated control.

SME-143

Impact of Interest of Gram Pradhans on Adoption of Smart Agriculture in the Village

Sudha Garg
Deptt. of Political Science, S.M.P.G. Girls P.G. College, Meerut

The researcher conducted a survey in 25 villages in the District Meerut and interviewed their Gram Pradhan and the farmers. It was found that the interest of Gram Pradhans made a remarkable impact on adoption of modern technologies by the farmers. Gram Pradhans were responsible for dissemination of various schemes of the Government and their active support created the interests in village farmers for modern technology. The farmers of 11 villages showed their dissatisfaction from the working and functioning of their Gram Pradhan while farmers of 08 villages gave a mixed reaction. There were only 06 villages where the farmers expressed their full satisfaction with their Gram Pradhan. On deeper

study, it was found that the role of Gram Praadhan in overall development of the village plays an important role and the Government should give them more power and independence for working. Gram Pradhan should be adequately educated for dissemination of various schemes and the use of internet facility.

SME-144

Ratooning in Vegetable Cropping

Vimal Kumar Naga[1], Rakesh Kumar[1], Deepak Kumar[3], Sachin S Chikkeri[1]
[1]Division of Vegetable Science and Floriculture, SKUAST, Jammu
[2]Division of Agronomy, SKUAST, Jammu

Increase in population which directed towards food scarcity and malnutrition obliged the immediate need to rise vegetable production of that is early maturing with sound ratooning capacity. Ratooning is the agricultural practice of prolonging the harvest period and increase yield of crop. It is performed by removing the majority of the above ground vegetative portion of the crop following harvesting. Further the growth of the plant is encouraged by the application of fertilizers in regular intervals with sufficient irrigation so that the crop should to able bear the yield of second season and provide effective yield. The technology of ratooning is standardized and promoted in very few vegetable crops like Okra, Brinjal, Chilli and Amaranthus.

The hybrid vegetables deliver better response for the ratooning and also it helps farmers to abstain from the expenses of purchase of hybrid seeds, field preparation, initial sowing, cultivation and other expenses. In other ways ratooning helps to obtain yield in the off season also through some alterations which also fetch premium price in the market. Ratooning also helps in saving seed along with stimulating regrowth (30 %) and saving labor (20 %). However, 31 % of responses that were against ratooning cited increased disease potential, as well as excessive vegetative regrowth (18 %). With above benefits ratooning can be used as an advanced approach in vegetable crops with simultaneously concentration on breeding for enhanced ratooning efficiency in vegetatively propagated vegetables.

SME-145

Climate Smart Agriculture: A new dimension of crop productivity and food Security under changing climatic condition

Vinai Kumar[1], Dipti Bisarya[2], A. K. Singh[3] and Gurdeep Bains[4]
[1]Teerthanker Mahaveer University, Moradabad (UP)
[2]School of Agriculture, Lovely Professional University, Phagwara, (Punjab) [3] Deptt. of Agril Economics, College of Agriculture, Campus Azamgarh, NDUAT, Ajodhya, (U.P.)
[4] Deptt. of Plant Physiology, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakhand

Climate change possess a major constrains for global crop production and food security in the 21st century. However, climate change is a global issue, but its impacts are more widely felt in the developing countries like India because of its greater vulnerability and less ability to mitigate the adverse impacts climate change. Recently, the idea of climate smart agriculture (CSA) has introduced to minimize the threats of climate change and reforming and reorienting agricultural systems. CSA is interdisciplinary, science based practices that integrate working of various groups e.g. farmers, crop scientists, public sectors and policymakers together towards climate-resilient pathways. It promotes the farmers ' adaptive capacity, increasing resilience and resource use efficiency of natural and agricultural ecosystem in coordinated manner and may contribute in sustainable crop production and food security in the era of climate change.

SME-146

Henipavirus Encephalties as Zooneses

Iqra Arif
S.V.P.U.A&T, Meerut
E-mail: iqraarif3232@gmail.com

Henipa virus is new emerging zoonotic disease that cause fatal encephalitis in humans of paramyxovirus family. They are comprising of Hendra virus and Nipah virus. Hendra virus was first discovered in Australia in 1994 which infect horses while Nipah virus, was first discovered in Malaysia in 1999 causing fetal outbreak leading 40% mortality in association with infected Pig.
The mechanism of zoonotic transfer via droplet inhalation or direct contact with secretion or excretion from infected animals. The natural reservoir is identified as fruit bats of *Pteopros* species with horses and pig acting as amplifying hosts. The pathognomonic of sign of henipa virus infection is disseminated microinfarctions as a result of vasculitis- induced thrombosis. The diagnosis of henipavirus infection is based on history of contact with sick mammals, evidence of encephalitis, serologic evidence of infection using ELISA or PCR. Magnetic resonance imaging of brain was sensitive and specific diagnostic tool. Henipavirus remains an important cause of zoonotic fatal encephalitis worldwide.

SME-147

Review on COVID-19 outbreak worldwide

Amit Kumar Singh, Dr. Maya Datt Joshi and Shiva Sharma
Shobhit Institute of Eng. And Tech, Meerut

Coronavirus is a B class type of the SARS family virus. SARS was first discovered in 2002-03 in human and stared was in china through bats. It is a deadly virus as the patient with lower immunity can lead to death. This virus affects the respiratory system of the health people and can lead to pneumonia and can lead to fatal conditions. The novel COVID-19 was first reported by Dr. Li Wenlian, who died from this disease itself. The break through started in the Wuhan city of china in last month of 2019. The exact transmission of this virus is still unknown, but it is believed that the infection spread through eating non -veg foods like bats etc. From there it comes into the contact of human. Now it has been found that the spread is due to droplets from the infected person into the environment. The exact treatment of this viral infection is still unknown and a lot of research is presently undergoing to find the vaccine/drugs that can relieve the infected patients and save the life of infected people. As of now around 2% of the total infected people have died and around 19% have gone into the critical conditions as well as 81% have been recovered from the disease as reported by WHO. The number of patients infecting the healthy patient was around 1 : 3 and this can become an epidemic for the world. This disease has already become the epidemic for china and spread out to around 29 countries of the world in all the continent are affected by this disease and continuously increasing.

SME-148

Biochemical Behavior of *Mentha arvensis* to varying concentrations of $HgCl_2$ stress

Monika Bajpai[1] and Rita Singh Majumdar[2]
[1]Faculty of Life Sciences, Institute of Applied Medicines & Research, Ghaziabad, UP, India.
[2] Professor, Department of Biotechnology, School of Engineering & Technology, Sharda University, Greater Noida, UP, India.
E-mail: shukla.mona@gmail.com

Mentha arvensis, a member of family Lamiaceae, is a pharmaceutically important medicinal plant. The present study was carried out with an aim to investigate the biochemical response of the leaves of this plant against $HgCl_2$ stress. The concentrations of $HgCl_2$ under observation were 0,1,5,10,20 µM. Superoxide radical generation, the rate of hydrogen peroxide production, lipid peroxidation, levels of superoxide dismutase (SOD), catalase (Cat), ascorbate peroxidase (APX) and glutathione reductase (GR), non-protein thiol (NPT), proline, ascorbic acid fluctuations and glutathione were studied and the impact of varying mercuric chloride concentration on ROS were accessed. Our results indicate the significant increase in superoxide ion, hydrogen peroxide and malondialdehyde production with 20 µM treatments displaying the highest values as compared to control.SOD, CAT and APX also followed the

same pattern with 20 µM at highest value as compared to the control. GR activity, contrastingly, displayed a decreasing trend among the various treatments. At 20 µM conc. of $HgCl_2$ all the parameters of oxidative stress and antioxidant enzymes displayed a significant increase as compared to control. NPT, proline, ascorbate and glutathione did not exhibit any significant increase but were in accordance with the previous reports.

SME-149

Vegetable Grafting: A non-conventional approach towards enhancing productivity

Anil Bhushan and RK Gupta
Directorate of Research, Administrative Block, Main Campus Chatha
SKUAST-Jammu (J&K)
E-mail: anilbhushan2008@gmail.com

Vegetable grafting is a process involves joining together two parts (a rootstock and scion) from different plants to form a single, living plant. Rootstock is a plant already has an established, healthy root system and is selected for their ability to resist under abiotic and biotic stress condition or their ability to increase vigour, precocity and compatibility with scions. A rootstock with strong root system can support a long season crop along with improved resistance to various diseases for green house cultivation. The scion of the grafted represents the upper portion of the plant and is selected for its fruit quality characteristics. Grafting has main influence on vegetative growth, flowering, and increased vigor of the crop which results in earlier or higher yields and superior quality. It provides ample of advantages viz., eliminating incompatible barriers in distant hybridization, manage soil-borne diseases, improve fruit quality (appearance, size, shape, color, firmness, texture, pH, carotenoid content, flavour), improve crop response to abiotic stresses such as salinity, drought, flooding and tolerance against heat and cold stress. For a graft union to be successful, callus proliferation (from both the rootstock and the scion), callus bridge formation, differentiation of new vascular tissue from callus cells and the production of secondary xylem and phloem during formation of graft union are imperative aspects. It has also been observed that a low or incorrect callus formation between the rootstock and scion could result in many negative effects such as plant defoliation, reduction of scion growth and low survival of grafted plants. As far as procedure is concerned, scion and rootstocks cab be raised in portrays or poly bags for seedlings and sowing of seeds for rootstock is done one week prior to sowing of scion seed. After three weeks, grafting can be done manually by using any grafting method viz., Wedge grafting, Inverted Wedge grafting and side grafting. Immediately after grafting, the union is tied with poly sheet of grafting clips and placed under high humidity dark chamber for healing. After 15 days, humidity level is to be reduced slowly and later on put the grafted plants under green house for hardening so that they can become ready for transplanting under protected conditions or open field.

SME-150

Physiomolecular aspects of green algae: *Chlorella*

Ashu, Devendra Kumar and Y. Vimala
Department of Microbiology, C. C. S. University, Meerut (U.P)
E-mail: biotechnology.ashu@gmail.com

Microalgae comprise a vast group of photosynthetic organisms which has an extraordinary potential for cultivation as energy crops. Microalgae seem to be most promising renewable biofuel producer that has the potential to completely displace fossil fuels without affecting supply of foods and other crop products. One of the most important algae is *chlorella* which is also called super food because it has many nutraceuticals values. It is commercially produced in large outdoor ponds under controlled conditions. Potential health benefits of *chlorella* are mainly due to its chemical composition, which includes proteins (the highest protein content of any natural food, 55–70 %), carbohydrates, essential amino acids, minerals (especially iron), essential fatty acids, vitamins and pigments. In this respect, major bioactive components of *chlorella* are sulfated polysaccharides and gamma linolenic acid seem to play significant roles in imparting improved human body functions. 18S rRNA aspects are also studied in present study.

SME-151

Greenhouse Gases emission from Agriculture fields using DNDC model from Indo-Gangetic Plain of India

[1]Prabhat Kumar Tanwar, [2]Sayan Chatterjee, [3]Sudeep Asthana, [4]Ajay Kumar and [5]Dinesh Kumar

[1]University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi
[2]University School of Biotechnology Guru Gobind Singh Indraprastha University, New Delhi
[3]University School of Chemical Engineering and Physical Science, Lovely Professional University, Phagwara, Punjab
[4]Institute of Chemical Technology, University Mumbai
[5]School of Biotechnology Engineering & Life Sciences Shobhit Institute of Engineering and Technology University, Meerut
E-mail: prabhat8tanwar@gmail.com

The Greenhouse gases are increasing in the atmosphere and there is a huge concern among different countries of the world to reduce the emission of these gases so as to know their sources and pathways of emission. Methane, Nitrous Oxide and Carbon Dioxide are considered to be the major Greenhouse gases and these are majorly emitted by the agriculture fields as rice crop. In India, agriculture is

considered to be the largest anthropogenic source of Nitrous Oxide and Methane which accounts for 60 % and 70 % respectively. In this study, the Denitrification-Decomposition (DNDC) model has been used for estimating the emissions of Greenhouses gases. DNDC is a process-oriented computer simulation model of Carbon (C) and Nitrogen (N_2) bio-geochemistry in agro ecosystems. The model was run for the site- Meerapur-Muzaffarnagar U.P falling in Upper Indo-Gangetic region. The yield obtained of the grain at the study site i.e. Meerapur the crop yield in case of was 4938 kg C/ ha. On the other hand, the N_2 uptake value was 84 kg N/ ha which was in agreement with the fertilizer applied biomass and cropping period into the fields. The observed flux rate for CH_4 at Meerapur during the simulated emission was 4.4 kg C/ ha and for N_2O was 4.8 kg N/ ha. Flux of CH_4 varied between 0.11 kg ha^{-1} day^{-1} to 1.58 kg ha^{-1} day^{-1}. Emission of N_2O ranged from 0.2 g ha^{-1} day^{-1} to 7.7 g ha^{-1} day^{-1} during the crop season. The high peak of N_2O 50 DAT emissions was observed due to nitrification of ammonium-N present in the soil. The study recommends that proper management of nutrient practices and irrigation are necessary for proper crop production.

SME-152

Techniques for the Conversion of Pine Needle Biomass into Energy

Padam Singh[1], Richa Singh[2] and Yogesh Kumar Negi
[1]Ph.D- Scholar, Agricultural Sciences & Engineering, IFTM, University, Moradabad, U.P.
[2]PG Scholar, Department of Botany, Sri Guru Ram Rai University, Dehradun
[3]Assistant Professor, College of Forestry, VCSG UUHF, Ranichauri, Uttrakhand
E-mail: padamsingh1990@gmail.com

Forest fire is the foremost problem in the hills of Uttarakhand during the summer season every year. The main reason of these fires is the availability of plenty of the forest litter, and specially pine needles. Since, 16.36% forest in Uttarakhand is covered by Chirpine, it produces high amount of pine needles. This biomass covers the forest floor almost completely and is very prone to catch fire. But, so far, no effective use of these pine needles is identified. However, various technologies have been developed in the country for the conversion of biomass to useful energy. Studies showed that briquetting is greatest way to convert the biomass into energy. As an estimate, 1.3 kg of briquettes replaces 1 kg of coal and 3 kg of briquettes replace 1 kg of LPG usage. The end use of briquettes is mainly for replacing coal in industries for the generation of heat (e.g. steam generation, melting metals, space heating, brick kilns, tea curing, etc.) and power generation through gasification of biomass briquettes.

SME-153

Effects of media and antioxidants in shoot initation of *Elaeocarpous ganitrus* Roxb. (Rudraksha)

Manisha Chaudhary, Sandeep Kumar, Maya Datt Joshi, Rupesh, Rishi
Department of Biotechnology, Shobhit Institute of Engineering and Technology, Modipuram, Meerut, (U.P.)
E-mail: manishachaudhary2606@gmail.com

In Vitro initiation of *Elaeocarpous ganitrus* Roxb. (Eleocarpaceae) on Murashige and Skoog (1962), Anderson medium (1975), B5(Gamborg, 1966) and WPM(Woody plant media) were taken as four different types of media. In the culturing of explants (stems) were taken in each media. Shoot initiation was observed on specific concentration of plant growth regulators (PGR). PGR were taken individually and in combination along with the combination of different antioxidants on MS medium, Anderson medium, B5 and WPM. At specific concentration of plant growth regulators individually and in combination shoot initiation were observed in tree media out of four i.e. MS medium, Anderson medium and WPM.

SME-154

Targeting Glycoproteins as a therapeutic strategy for diabetes mellitus and its complications

Abhay Prakash Mishra, Surya Pratap Singh, Rozita Naseri, Seyed Jafar Navabi, Zeinab Samimi, Manisha Nigam, Harish Chandra, Ahmed Olatunde, Habibu Tijjani, Raquel P. Morais-Urano, Mohammad Hosein Farzaei

Glycoproteins are organic compounds formed from proteins and carbohydrates, which are found in many parts of the living systems including the cell membranes. Furthermore, impaired metabolism of glycoprotein components plays the main role in the pathogenesis of diabetes mellitus. The aim of this study is to investigate the influence of glycoprotein levels in the treatment of diabetes mellitus. All relevant papers in the English language were compiled by searching electronic databases, including Scopus, PubMed and Cochrane library. The keywords of glycoprotein, diabetes mellitus, glycan, glycosylation, and inhibitor were searched until January 2019. Glycoproteins are pivotal elements in the regulation of cell proliferation, growth, maturation and signaling pathways. Moreover, they are involved in drug binding, drug transportation, efflux of chemicals and stability of therapeutic proteins. These functions, structure, composition, linkages, biosynthesis, significance and biological effects are discussed as related to their use as a therapeutic strategy for the treatment of diabetes mellitus and its complications. The findings revealed several chemical and natural compounds have significant beneficial effects on glycoprotein metabolism. The comprehension of glycoprotein structure and

functions are very essential and inevitable to enhance the knowledge of glycoengineering for glycoprotein-based therapeutics as may be required for the treatment of diabetes mellitus and its associated complications.

SME-155

Integtration of functional biomaterials with micro– and nano- systems for sensing and actuation technologies

Sudheesh K. Shukla[1,2], Penny P. Govender[2], William Reis de Araujo[3]
[1]Nanobioengineering Group, School of Environmental Science and Engineering, Shandong University, Jimo, Qingdao 266237, P.R. China
[2]Department of Chemical Sciences-DFC (formely Department of Applied Chemistry), University of Johannesburg, P.O. Box 17011, Doornfontein 2028, Johannesburg, South Africa
[3]Portable Chemical Sensors Lab, Department of Analytical Chemistry - Institute of Chemistry - State University of Campinas (UNICAMP), Campinas/SP, Brazil
E-mail: sudheeshkshukla010@gmail.com

Electrochemical lab-on-a-chip biosensing devices are translational and mobile analytical micro-systems that enable rapid and label-free analyses of redox-active biomarkers, bringing benchtop medical diagnostic methods to the point-of-care. However, the selectivity of electrochemical biosensors towards the biomarkers-of-interest dramatically decreases in the presence of biofluids due to other redox-active molecules generating masking electrochemical signals, requiring pretreatment steps to filter the interfering molecules and limiting the biosensor's real-time analysis capabilities. Thus, engineering new electronic surfaces for the biosensors that would improve the signal-to-noise ratio of the electrochemical signals generated by the biomarkers and could be easily integrated in electrochemical lab-on-a-chip, would make a significant contribution to real-time measurement of various redox-active biomarkers in the body in health and disease, and would find utility in a wide range of biomedical applications, from in vivo diagnostics to in situ screening of drugs. In this work, we demonstrate the beneficial use of a stimuliresponsive biopolymer chitosan to modify electrodes using a controlled biofabrication scheme with a high spatiotemporal resolution that enables integrating functional bioelectronic surfaces in a microfabricated lab-on-a-chip. We use the functional biomaterials-integrated lab-on-a-chip to rapidly probe redox-active biomarkers in biofluids without pretreatment steps in three modes of detection: (1) detection of a specific biomarker, (2) influencing masking signals that interfere with the biomarker's detection, and (3) simultaneous detection of multiple specific biomarkers. We develop these modes of detection by modifying the surface of the electrodes with redoxresponsive films to amplify the oxidation current generated from the biomarker and decrease the required overpotential to shift the overlapping signals generated by other redox molecules in the biofluid. Nano-biofabrication of films with unique electronic characteristics for seamless integration in biosensing micro-systems will enable rapid and low sample volume analysis of markers in biofluids (such as blood) and will hopefully improve personalized health monitoring.

SME-156

Synthesize the glasses and glass-ceramics using biomass for engineering applications

Gaurav Sharma, and K. Singh
School of Physics and Materials Science, Thapar Institute of Engineering and Technology, Patiala
E-mail: gauravsharma@thapar.edu

In this work, glasses and glass-ceramics are synthesized using biomass as the resource materials. All the samples are prepared using melt-quench technique. The as-prepared samples are characterised using X-ray diffraction (XRD) for identify the present phases of the samples. Energy dispersive spectroscopy (EDS) and X-ray photoelectron spectroscopy (XPS) techniques are used to measure the exact chemical composition in the samples. FTIR is done to identify the functional group of the as-prepared samples. The impedance analyser technique is used to determine the dielectric properties of these glass-ceramics from room temperature to 600 ^{o}C with different frequency, which is suitable range for optoelectronics applications. Hence, further characterization is required.

SME-157

Effect of weeds Biomass Extracts against selected Fungi by Food Poisoning Technique

Alka sahrawat[1], Jyoti Sharma[1] and Siddarth Nandan Rahul[2]
[1.] School of Biological Engineering and Life Sciences, Department of Biotechnology Shobhit University, Meerut. 250110. India
[2.] Department of Plant Pathology, College of Agriculture, NDUA&T, Kumarganj, Ayodhya. India
E-mail: sagar4499@gmail.com

In India diseases are one of the major constraints responsible for low yield of crops production. Weeds are very common, dominant and wide spread in the crops field and also produce a huge biomass. Chemical Fungicides are almost using to control crop disease cause by fungus. It is cost effective and also reduces the soil fertility. The present study is to investigate the effect of weed biomass (leaves, stem, root) extract via. *Parthenium hysteroporus, Achyranthus aspera, Ampranthus spinosus, Cannabis sativa and Argemone maxicana* against different fungus via. *Fusarium oxysporium, Aspergillus flavus, Aspergillus parasiticus & Alternaria solani.* The antifungal activity was determined by food poisoining technique. Out of five weeds extract tested, cannabis sativa show effectiveness against *Fusarium oxysporium*. Along with that *Achyranthus aspera & Parthenium hysteroporus* were also controlled the mycelium growth of *Alternaria solani.* On the basis of result, we conclude that we can develop Environmentally, Ecofriendly fungicides from weeds biomass, which are cheap and affordable to rural farmers.

SME-158

Effects of Solar drying on organoleptic and nutritional values of fruits

Rupesh Kumar, Sandeep Kumar, Maya Datt Joshi, Dinesh Kumar & Amar P. Garg
School of Biological Engineeering & Life Sciences, Shobhit Deeemed University, Meerut.
E-mail: rupesh@shobhituniversity.ac.in

Fruits are essential food items as they play a vital role in the diet of humans. Fresh fruits are highly perishable commodities because of high moisture content. Hence, their transportation to distant places is costly and their condition on arrival in the importing country may be also less than satisfactory level. Postharvest loss of fruits in India is very high. This could be due to their perishable nature, poor postharvest handling and lack of cheap and appropriate postharvest technology. Hence, much effort is needed in the area of generating efficient, low-cost, indigenous technology that minimizes postharvest loss of fruits. One of these methods is to produce local value-added products through the development of micro- and small-scale agro-industries. Natural sun drying is the one of the most common methods adopted to preserve fruits or fruit based products beyond their natural shelf life. The process involves the exposure of fruits to the solar radiation to remove moisture content, thereby contributing to their conservation. The traditional method of solar drying with direct exposure to the sun had many disadvantages. Drying of these products in direct sun light is neither procted against dust nor against pathogenic microorganisms. Presently different designs of solar dryer is commercialized and available in market that may be used as hot air drying without significant change in organoleptic and nutritional values of fruits. Solar drying of fruits is one of such agro-based industries that can not only enhance the shelf life of fruits but also play a significant role in doubling the income of farmers. Therefore, the main objective of this paper is to review the potentials and possible methods of solar drying of fruits with major emphasis on methods of drying and effects of solar drying on organoleptic and nutritional values of fruits.

SME-159

Investigations on probiotic characteristics of fermented soymilk with lactic acid bacteria (LAB) as functional food

Aditya Pundhir[1], Abhishek Maurya[2]
[1]Evelyn Learning Systems, New Delhi
[2]Rapid Diagnostics, New Delhi
E-mail: aditya.pundhir@gmail.com

Non-dairy probiotic foods are becoming popular because they do not pose problems of lactose intolerance and high cholesterol content. Soymilk provides a high quality of protein, iron, unsaturated

fatty acids and niacin. It is devoid of cholesterol, gluten and lactose; therefore, serve as beverage for lactose-intolerance consumers, vegetarians and milk-allergy patients. The objective of this study was to develop a probiotic soymilk by utilizing the commonly used lactic acid bacteria. Three strains of bacteria (*Lactobacillus lactis, Lactobacillus plantarum and Lactobacillus fermentum*) were chosen to maintain high viability along with multiple health benefits. The probiotics properties of soymilk were investigated as a function of soymilk protein, sugar, isoflavonoid and phenolic content, pH, hydrophobicity, total titrable acidity, and antioxidant activity. Survival of all test strains during fermentation and 30 days of refrigerated storage was examined. During fermentation of soymilk by the strains, dramatic increase in nutritive content and antioxidant potential has been obtained.

LOCAL ORGANIZING COMMITTEE

RECEPTION AND WELCOME COMMITTEE

Dr. Poonam Dev Datt
Dr. R. K. Jain
Dr. Niraj Singhal
Dr. Rashmi Khorana Nagpal
Dr. Vishal Bishnoi
Dr. Ashok Kumar
Dr. Satya Prakash
Dr. Vipin Tyagi
Mr. Mahesh Kumar Mishra
Mr. Vijay Maheshwari
Dr. Sandeep Kumar
Dr. Parul Sharma
Dr. Jayanta Mahato
Mr. Pius. W. Ferdinands
Mr. Aniket Kumar
Mr. Amit Sharma
Mr. Raj Kishore Singh

TECHNICAL/ ACADEMIC PROGRAMME COMMITTEE

(A) ORAL PRESENTATION

Dr. Saurabh Tyagi
Mr. Avinav Pathak
Er. Gaurav Yadav
Ms Shiva Sharma
Dr. Mohd. Imran
Dr. M.M. Khan
Mr. Amit Kumar Singh
Mr. Jitendra Singh
Ms. Vani Rastogi
Mr. Pawan Kumar
Mr. Pankaj Kumar

(B) POSTER PRESENTATION

Dr. Maya Datt Joshi
Dr. Alpana Joshi
Dr. Divya Prakash
Dr. Jyoti Sharma

Dr. Vahim
Dr. Namitosh Tyagi
Dr. Sanjeev Kumar
Mr. Yogesh Vikram Srivastava
Mr. Raman Gahlaut
Mr. Prashant Pundir
Mohd. Shehzad
Mr. Shamshad Husain

SOUVENIR AND ABSTRACT COMMITTEE
Dr. Alpana Joshi
Dr. Snigdha Tiwari
Ms. Beena Rawat
Mr. Avinav Pathak
Dr. Saurabh Tyagi
Dr. Maya Datt Joshi

ACCOMODATION COMMITTEE
Mr. Rupesh Kumar
Er. Gaurav Yadav
Ms. Shraddha Maurya
Ms Shiva Sharma
Dr. Dinesh Kumar
Dr. Anuj Kr. Agarwal
Mr. Chhabilal Singh
Mr. Rajesh Pandey

REGISTRATION AND CERTIFICATE COMMITTEE
Ms. Beena Rawat
Ms. Shiva Sharma
Ms. Nisha Parveen
Mr. Anuj Chaudhary
Mr. Ashish Upadhyay
Mr. Gauri Shankar
Mr. Amit Tomar
Ms. Manisha Chaudhary
Ms. Neha Bisht

INAGURAL AND VALEDICTORY COMMITTEE

Dr. Snigdha Tiwari
Dr. Parul Sharma
Dr. Alpana Joshi
Ms. Shiva sharma
Ms. Beena Rawat
Dr. Saurabh Tyagi
Mr. Pius. W. Ferdinands
Dr. Anita Rathore
Dr. Mamta Bansal
Dr. Neha Vashistha
Ms. Neha Tyagi
Dr. Asma Khan
Dr. Neha Yajurvedi
Dr. Anuj Goel
Dr. Shivani
Dr. Abhinav
Dr. Sneha Navin
Mr. Mridul Vaish
Er. Ayush Madan

FOOD AND CATERING COMMITTEE

Mr. V.K Singh
Mr. Gaurav Yadav
Mr. Rajiv Kumar
Mr. Rohit Vats
Mr. Vivek Sharma

PRESS AND MEDIA COMMITTEE

Dr. Abhishek Kumar
Dr. Anita Rathore
Ms. Anjali Upadhyay
Dr. Maya Datt Joshi
Dr. Dinesh Kumar

CULTURAL COMMITTTEE

Dr. Parul Sharma
Dr. Snigdha Tiwari
Ms. Shiva Sharma

Ms. Juhi Chopra
Dr. Alpana Joshi
Ms. Beena Rawat
Ms. Shikha Choudhary
Dr. Anshu Choudhary
Dr. Preeti Garg
Dr. Neha Vashistha
Ms. Neha Rani
Ms. Gargi Chaudhary
Mr. Rahul Tomar
Ms. Uma Sharma
Mr. Sunil Kumar Gupta

Exhibition Incharge
Er. Gaurav Yadav
Mr. Amit
Dr. Dinesh Kumar

STUDENT VOLUNTEERS
Utkarsh
Avishka
Buts Kumar Gaurav
Nitin Chauhan
SuryaDev
Jatin
Santosh
Ashish K Tyagi
Gaurav Mishra
Jyoti
Keshav
Akansha
Kiran Moy
Pawan Kalyan
Prashant
Harsh
Shivam
Naresh
Arpit
Ambika

Rohit
Ritu Bala
Shivani
Dev Tyagi
Srinivas
Sai Venkatesh
Vinay Kumar
Sandeep
Sonali
Yashi
Priti
Anshika
Nikhlesh
Gaurav Tomar
Shrusthi
Ritika
Anushka Tyagi
Maansi Chauhan
Aditi Siwach
Ankit Bhai Patel
Risabh Goyal
Hemant K Sharma
Amisha Bishnoi
Puja Chauhan
Shivangi
Shubhendu
Isha
Chetna
Aarvi
Supriya
Aravind
Dinesh
G. Pawan
Hammad
Gautam
Ranjan
Ramsha
Sweety Pal
Shrusthi

Aprajita
Puneet
Simran
Vidushi
Prince
Nishant
Shubham Goswami
Afeefa
Ruchika
Beena
Rishi

LIASIONING COMMITTEE
Prof. A. P Garg
Prof. Satya Prakash
Prof. Sandeep

Note: Prof. A. P Garg, Dr. Sunil Chandra, Dr. Ganesh Bhardwaj and Mr. Vijay Kumar Singh are *ex-offico* members of all the above committees.

AUTHOR INDEX

D

G

H

I

J

K

L

M

N

P

R

S

T

U

V

Y

WHY SHOBHIT?

We are committed to creating the best learning environment and provide the right equipment and facilities, to help our students to achieve their potential during studies. Our students learn in a variety of ways, including case studies, role-plays, and simulations. Because we know that no single approach can effectively address the range of challenges they'll encounter throughout their career, this diverse education is designed to give them the breadth and depth of skills and experience they'll need for success.

We invest heavily in our teaching and learning facilities so that you can make the most of your university experience. We have been teaching for more than 30 years, but our faculty is much more senior. Well-known experts, media guru, scientists and leading business figures will be mentoring programs. Best of all, we provide you with support and guidance throughout your studies.

- 30 Years of proud academic legacy with Global Alumni Network
- Ranked amongst Top 20 Technical Universities in India by India Today *(Issue dates: July 2018)*
- School of Business Studies ranked 17th in North India and 55th Pan India in Times B-Schools Ranking 2019
- School of Law and Constitutional Studies ranked 3rd in India's Top Law Schools of Excellence Ranking list by CSR-GHRDC Law Schools Survey 2019
- Govt. of India MSME-ASPIRE Technology Business Incubator (TBI) creating an ecosystem of innovation on campus
- Highly research oriented environment with opportunity of working on industry consultancy assignments
- Collaboration with foreign institutions offering options of exchange programs
- Flexible and Choice Based Credit System (CBCS) in an interdisciplinary Outcome Based Education framework
- Cutting edge curriculum authenticated by industry
- Contemporary pedagogy based on case studies and field projects
- Highly qualified and experienced faculty members drawn from Industry and Academia
- Additional certifications in emerging technology based courses for enhanced employability
- State-of-the-Art infrastructure in a lush green campus
- Specially designed training modules on Communication Skills and Personality Development
- 100% Placement Assistance by University Training & Development Centre.

MEERUT - A CITY OF OPPORTUNITY

Meerut, an important city of National Capital Region, is a metropolitan city. The city lies 70 km northeast of the national capital New Delhi and is the second largest city in the National Capital Region of India, the 17th largest city in India. It ranked 242 in the list of largest cities and urban areas in the world.

COURSES OFFERED

Engineering

B.Tech. ^ (21st Batch)
Agri-Informatics Engineering
Bio-Informatics
Biomedical Engineering
Biotechnology
Electronics & Communication
Mechanical Engineering
Computer Science & Engineering

Specialization
- Cloud Computing
- Internet of Things
- Advanced Computing
- Network and Information Security
- Data Science & Machine Intelligence

M.Tech. (14th Batch)
Agricultural Informatics
Bio-Informatics
Biomedical Engineering
Biotechnology
Communication Engineering
Computer Engineering

Lateral Entry B.Tech. (Diploma to Degree)
Computer Science & Engineering
Electronics & Communication
Mechanical Engineering
Agriculture Technology
Biotechnology
Biomedical Engineering

Computer Applications

MCA ^ (23rd Batch)
BCA (25th Batch)

Agriculture

B.Sc. Agriculture (4 Yrs)

B.Sc. Honors

Biomedical, Biotechnology
Computer Science

M.Sc. Programs

Biomedical, Biotech, Microbiology
Computer Science, Mathematics

Library Science

BLIS (1 Yr) | **MLIS** (1 Yr)

^ Lateral Entry Available

Management

MBA (26th Batch)
Marketing Management
Finance Management
Operations Management
Human Resource Management
International Business Management
MBA Pharmaceutical Management
BBA (25th Batch)

Agri-Business Management

MBA Agri-Business Mgmt (2 Yrs)

Commerce

M.Com.
B.Com. Honors

Business Economics

B.A. Honors Business Economics

Psychology

BA Honors **Psychology**

Law Programs

B.A.,LL.B. (5 Yrs)
B.Com., LL.B. Hons (5 Yrs)
BBA, LL.B. Hons (5 Yrs)
LL.B. (3 Yrs)
LL.M. (2 Yrs) | **LL.M.** (1 Yr)

Education

MA Education
B.Ed.

Yogic Sciences

PG Diploma in Yoga

Research Programs

M.Phil. (1 Yr)
Biotechnology
Business Management
Psychology, Education
Computer Science
Mathematics
Microbiology
Library Science
Ph.D.

To know more about the Academic / Research programs on offer for the current Session please visit University Website or write / talk to our Admission Advisor.





SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY

[A NAAC Accredited Deemed to-be-University established u/s 3 of UGC Act 1956]

NAAC UGC AICTE AIU BCI NCTE UPGOVT ISO 9001:2015

University Campus: NH-58, Modipuram, Meerut, Delhi NCR, India | **www.shobhituniversity.ac.in** | **+91-9870265521**