Happening at BAU

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From the Desk of the Vice-Chancellor

Holistic development of farming community is the outcome of pragmatic extrapolation of teaching, research, extension and training by the agricultural university. Bihar Agricultural University, Sabour is committed for these, since its establishment. Shri Nitish Kumar, Hon'ble Chief Minister of the state launched Climate Resilient Agriculture (CRA) Programme under *Jal-Jeevan-Haryali* Programme on December 14th for remaining thirty districts of the state. Scientists of Molecular Biology and Genetic Engineering worked on plant viruses by targeting their assembly process and potential druggable and brought out publications in international journals. Agricultural Education Day and World Soil Day were celebrated across various units of the university. I call upon all the teachers, scientists, students and staff of the university to put upon their endeavour, dedication and support for accelerated development of the university.

Dear Friends,

Happy New Year! We are presenting before you the two hundred and twenty two issue of the Newsletter. This issue consists of information on Research, Education, Extension and Training program conducted and organized by the University during the month. This newsletter is the medium to reflect our hard work in the field of research and other activities. Kindly share important investigation and observations for making Happening at BAU more meaningful and popular among subscribers. Your inputs for the newsletter must reach us at least one day in advance to the date of issue. You may also like to circulate it to other colleagues and provide their email ids, so that they may get the Happening at BAU in time.

-Team Happening

Focus of the University

Chief Minister Shri Nitish Kumar Launches CRA Programme

Shri Nitish Kumar, Hon'ble Chief Minister of the state launched Climate Resilient Agriculture (CRA) Programme under *Jal-Jeevan-Haryali* programme on December 14 for remaining thirty districts of the state. This CRA Programme is continuing in eight districts since last year. The program was presided over by Shri Amarendra Pratap Singh, Hon'ble Agriculture Minister. Chief Minister showed his displeasure on stubble burning during the inaugural programme. The CM asked the state's top officials to carry out an aerial survey to assess the real context of stubble burning. He also asked to take proactive measures to

refrain the farmers to stop this practice. He also told that Government is also providing a subsidy of 75% (up to 80% for those belonging to the SCs and STs and EBCs), towards the purchase of agricultural implements like rotary mulcher, straw reaper, straw baler and reaper cum binder. In this occasion the university also showed the different activities of CRA carried out by KVKs through live telecast and the activities were technical demonstration of wheat sowing and other demonstrations. The programme was watched by all the scientists of the university, KVKs, large number of farmers and Dean and Directors of the university.

Agriculture Secretary Observed Performance of CRA Programme

Dr N Saravana Kumar, Secretary, Department of Agriculture, Govt. of Bihar and Shri Gopal Singh, OSD to Hon'ble Chief Minister of Bihar visited the university on December 17th. Prof (Dr) Ajoy Kumar Singh, Hon'ble Vice-Chancellor of the university accompanied them to the KVK, Sabour and other units of the university. They visited the different demonstrated fields (Crop) in the Climate Resilient Agriculture (CRA) Programme. The performance of different cropping system viz. paddy-wheat-moong, potato-maize cropping, maize-wheat-moong, rice-mustard-moong and paddy-gram crop was observed. They also addressed the Crop Residue Management Awareness-cum-Training Programme and Agriculture Secretary appealed to the farmers to better management of crop residue, instead of destroying or burning the crop residue which is harmful for the environment. He also added that adding crop residue in soil increase organic matter content in soil. CRA Programme was started initially

in eight districts; however, from this year, it is being scale up to thirty eight districts of Bihar. Hon'ble Vice-Chancellor told that university is working hard to implement the CRA Programme in Bihar, the one of the dream projects of Shri Nitish Kumar, Hon'ble Chief Minister of Bihar.

Combat from Plant Viruses by Targeting their Assembly Process

Plant viruses cause various diseases in crops and are responsible for huge economic losses. Understanding their mode of infection and spread is crucial for developing control strategies. Genome packaging is an important step in the process of viral maturation. Three systems of viral genome packaging are known till date. The type-I packaging system, found in most of the small plant viruses, involves co-condensation of nucleic acid with viral capsid proteins (CPs) leading to the assembly of virion particles without utilizing ATP. The type-II and type-III packaging systems, present in phages and nucleo-cytoplasmic large DNA viruses, exhibit genome translocation inside the prohead by utilizing ATP. Discovery of the ATPase fold in the CPs of many small plant viruses and the requirement of other ATPases during genome encapsidation have changed the perception about genome packaging in the type-I system. Moreover, these studies have suggested that in these plant viruses, the genome encapsidation process is more intricately coupled with energy utilization than in other systems. Here, we present a novel classification system on the basis of ATP employed. This study will give us an opportunity to target the assembly of plant viruses.

Potential Druggable Targets to Fight Against Novel COVID-19

The whole world is still suffering substantially from the COVID-19 outbreak. There are no effective therapies for COVID-19 hitherto, and the existing treatments are mostly supportive. Several protein-based molecules that are associated with the SARS-CoV-2, which are essential for its functionality, survival, and pathogenesis have been identified and are considered as potential therapeutic targets. These protein-based molecules are either structural/ non-structural components of SARS-CoV-2 or host factors, which play a crucial role in this infection. Developing drug molecules against these essential functional molecules to hinder their regular functioning and associated physiological pathways could be very promising for successful clinical management of this novel coronavirus infection. Imperatively, several approved drugs and some naturally derived compounds possessing antibiotic activities have shown promising results and high binding affinities against these target molecules. The review aims to highlight the crucially required functional molecules associated with the SARS-CoV-2 pathogenesis. We have also emphasized how these potential druggable targets can play an important role in tackling the COVID-19 crisis.

Nutrient Rich Vermicompost Developed using Parthenium

Scientists from the Department of Soil Science and Agricultural Chemistry, BAU, Sabour have been able to prepare a nutrient rich vermicompost of good quality from Parthenium which is widely reported to be one of the world's most destructive invasive plant species threatening biodiversity, food security and human health. Parthenium invasion not only results in yield losses in several food and forage crops but also causes health problems since indirect or direct contact with Parthenium can cause skin problems and allergies in people and the plant is also toxic to grazing livestock. The vermicompost prepared from Parthenium after laboratory analysis has been found to have higher concentrations of nutrients esp., N, P, K and S. Biological conversion of the Parthenium collected before flowering from their natural habitat into vermicompost not only helps in their eradication, but also give us an organic amendment which can potentially enhance soil health for sustainable agriculture. This work is a part of a University funded Research project led by Dr. Sankar. Ch. Paul (Asstt. Professor, Soil Science, BAC, Sabour) in association with Dr. Amit Kr. Pradhan (Asstt. Professor, Soil Science, BAC, Sabour) and Dr. Sunil Kumar (Asstt. Professor, Soil Science, BAC, Sabour).

Celebration of World Soil Day

World Soil Day was celebrated on December 5th various unit of the University. After proposal of the December 5th of as World Soil Day by the International Union of Soil Sciences (IUSS) in 2002 and its unanimous endorsement by Food and Agricultural Organization in June 2013; the 68th UN General Assembly declared 5th of December as the World Soil Day. Since the theme of this year's event as designated by the FAO is "Keep soil alive, protect soil diversity". Dr Manna is a renowned Soil Scientist with a huge amount of experience and expertise in the field of Microbiological Transformation of Nutrients, Carbon Sequestration, Waste Recycling and Soil Health. Dr Manna delivered World Soil Day lecture on the topic "Carbon Sequestration and Conservation of Soil Biodiversity" virtually at Department of Soil Science and Agricultural Chemistry, BAC Sabour.

On the eve of World Soil Day, at BPSAC Purnea, Dr Paras Nath, Associate Dean-cum-Principal, BPSAC enlightened the students with the importance of soil as natural resources for survival of mankind. He stressed upan to maintain fertility and productivity of soil for sustainable agriculture. He also mentioned the theme of world soil day 2019 is Stop Soil Erosion, Save our Future. Sri Sanjay Kumar, Dy Director Chemistry, Govt. of Bihar, Patna said that the importance of soil

and this day also. He give emphasis on soil testing and distribution of soil health card to farmes by government for balance use of fertilizer. He also visited to laboratory and agricultural farm also.

In this programme 30 trainees of RSETI, SBI, Khuskibag, Purnea also participated. Dr Anil Kumar, Dr Ravi Kesari, Sri JP Prasad and students of BSc (Ag) from different semester actively participated in virtual mode in this programme. On this occasion different competitions were also organized by Department of Soil Science and Agricultural Chemistry in collaboration with NSS/RRC/Literary and Debating Society, BPSAC Purnea in virtual mode.

Certificate Course Training Programme on INM

Department of Soil Science and Agricultural Chemistry, Bhola Paswan Shastri Agricultural College, Purnea organized fourth fifteen-day certificate course for fertilizer dealers. The programme was inaguarted in gracious presence of Prof (Dr) Ajoy Kumar Singh, Hon'ble VC, BAU Sabour. Dr Paras Nath, Associate Dean-cum-Principal, BPSAC Purnea given welcome speech and provide bouquet and shawl to all guest. Dr RR Singh, Dean (Ag), BAU Sabour, Bhagalpur spoke before the gathering of trainees, narrated about the program. On this occasion he addressed participants about importance of balance nutrition of crops as well as save soil health.

In this programme chief guest Dr Ajoy Kumar Singh, Hon'ble Vice-Chancellor, BAU Sabour said that the this training was launched by government of India after report of parliament Standing committee on agriculture to introduce 15 days certificate course on Integrated Nutrient Management (INM) as a qualification for fertilizer dealers. Accordingly Ministry of Agriculture, Cooperation and Farmers Welfare, DAC & FW recently substituted clause 8 (4) of fertilizer control order (FCO) 1985 vide order dt. 30.07.2018, whereby it has become mandatory for the dealers to undergo a certificate course of 15 days on INM for obtaining a authorization letter for selling of fertilizers. Under the said clause, State Agricultural Universities are empowered to conduct this training programme.Special guest Sri Vijay Kumar, Special Secretary, Govt. of Bihar said that the this is very good process of training for fertilizer dealer. In this session Dr RK Sohane, Director Extension Education, BAU Sabour also graced the programme and distributed Bihar Kisan Diary to all registered participants. Dr Pankaj Kumar Yadav, BPSAC Purnea and Nodal Officer-cum-Course Coordinator, INM Training Programme enlighten the programme details with complete coure curriculam and said that the every day three theory and one preactical

classes will be conducted by differet experts of BAU and Govt. of Bihar. Total of 32 theory classes, 12 practical classes and other 19 extra classes were conducted by experts of Soil Science, Agronomy, Horticulture, IFFCO, Bank officials, Account experts of college and KVKs will be conducted during this training. Two days exposure visit was conducted during this training participants visited namely KVK Jalalgarh and get practical experiance about vermicomposting unit, Azolla Production unit, BGA unit, Agricultural Research Farm, Mushroom unit, Gardens of different units. Trainees was also visited for practical work at District Soil Testing Laboratory, Purnea and Gromor Nursery, Purnea. In this training programme, 30 participants comprising of 02 of Madhepura, 09 of Araria, 09 of Katihar and 10 participants from district Purnea, respectively were participated in fifteen days certificate course on INM for obtaining the licence for selling fertilizers. All participants were received study materials namely Kisan Diary 2020, INM Book, SD Card of technical Video of Bihar Agricultural University during INM Training. In this programme Dr Janardan Prasad, Dr Pankaj Kumar Yadav, Dr Anil Kumar, Sri JP Prasad, Dr GL Chaudhry, Dr Tapan Gorai, Dr Ruby Saha, Dr Ravi Kesari, Dr S Nath and all teaching and non-teaching staff of BPSAC Purnea actively participated. The vote of thanks extended to participants by Dr Anil Kumar and Dr Ruby Saha.

BAU Celebrates Agricultural Education Day

Agricultural Education Day was successfully celebrated on virtual mode at different colleges of Bihar Agricultural University on the eve of birth anniversary of Dr Rajendra Prasad on December 3rd. Before the event took place, invitation to nearby schools like Happy Valley School, Mount Assisi School and DAV School of Bhagalpur were sent to get nominations of the students.

The program was inaugurated by a speech of Dr RP Sharma, Associate Dean-cum-Principal of BAC Sabour which was followed by a self-written song on 'Agricultural Education in India' was sung by Ms Anuradha Kumari (UG student, 3rd Semester). The lyrics of the song itself explained the glory of the Agricultural Education in India. The programme was extended further with the remarks of Dr Rajesh Kumar, Director Student and Welfare of the university. A drawing exhibition, participated by the students of different colleges, on thematic area "Climate Smart Agriculture" also took place by 'Slide Show'.

A debate on "Agriculture Startsup is a Viable Career Option" was also organised. A total of eight students (including school students) participated in the debate. Debate competition was structured into two parts: FOR and AGAINST the pre-decided motion. Rakesh Kumar, Richa Kumari (BAC Sabour), Sakshi Priya (Happy Valley School) grabbed 1st, 2nd and 3rd in FOR the motion; whereas, Ms Marya Ansari, Mr Sumit Sow and Mr Arnab Mukharjee from BAC Sabour earned 1st, 2nd and 3rd position in AGAINST the motion. Similarly other competitions were also conducted at different colleges.

A glimpses of activities conducted online at BPSAC Purnea is presented here

Name of Participants	Semester	Secured Position
Poster Competition on: New Agriculture Policy of India		
Muskan Jha	3rd	First
Megha Kumari	3rd	Second
Babli Kumari	3rd	Third
Essay Writing Competition on: New Agriculture Policy of India		
Raghav Goyal	5th	First
Babli Kumari	3rd	Second
Himanchal Kumar	5th	Third
Debate Competition on: New Agriculture Policy of India		
Yash Raj	3rd	First
Shubham Kumar	3rd	Second
Raghvendra Prasad	3rd	Third

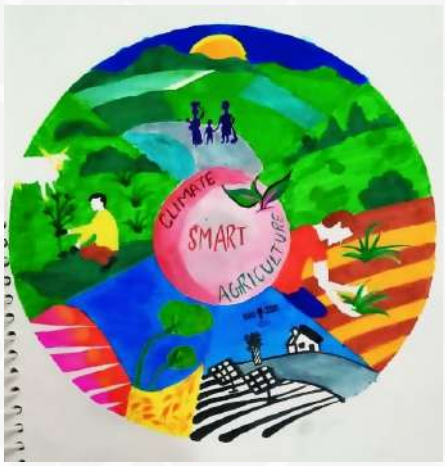
A glimpses of activities conducted online at NCOH Nalanda is presented here

Name of Participants	Organisation/ Semester	Secured Position
Quiz Competition		
Attiya Aafrin	Sadar Memorial Secondary School, Biharsharif	First
Piyush Raj	Global Competitive School, Noorsarai, Nalanda	Second
Vinit Kumar	Global Competitive School, Noorsarai, Nalanda	Third
Essay Writing Competition on: Role of Agriculture in Indian Economy		
Attiya Aafrin	Sadar Memorial Secondary School, Biharsharif	First
Sonakshi Gupta	Sephali World School, Noorsarai, Nalanda	Second
Payal Rani	Global Competitive School, Noorsarai, Nalanda	Third
Debate Competition on: Effect of Burning of Crop Residue on Environment		
Yash Raj	3rd	First
Shubham Kumar	3rd	Second
Raghvendra Prasad	3rd	Third

During this event, Dr Feza Ahmed, University Professor and Associate Director Research, BAU Sabour had thoroughly shed the light on "Scope of Agricultural Education" and encouraged the students from various schools to opt agriculture for higher study as well as for career opportunity. The students had few queries which were answered by the dignitaries present on the occasion. The concluding remark was delivered by Dr RR Singh, Dean (Ag) of the university. At the end, vote-of-thanks was given by Dr N Chattopadhhyay, Chairman, Soil Science and Agricultural Chemistry, BAU Sabour. During this event all the chairmen from various departments of BAU Sabour and many faculty members were also present.

Deepak Kumar Pal
1st Position

Ujjwal Kumar
2nd position



Varsha
3rd position

Kisan Divas or Farmers' Day-cum-Jai Kisan Jai Vigyan Week

The NSS of BPSAC Purnea celebrated as Kisan Divas or Farmers' Day as birth anniversary of Ch. Chran Singh and started Jai Kisan Jai Vigyan Week on December 23rd. Since, farmers are the backbone of Indian economy therefore our nation celebrates Farmers Day in the memory of late Ch. Charan Singh, the Ex-Prime Minister of India. Dr Paras Nath, the Associate Dean-cum-Principal addressed the students about life-history of the 'Son of Soil'. Dr Nath added that, Ch. Charan Singh was primarily a farmer himself and his personal life-style was extremely simple. He was a son of the soil and his efforts towards the improvement of Indian farmers are unparalleled. He is credited for a slew of agrarian reforms and new policies being introduced in India. His peasantry background helped him understand real problems of the farmers. He was pioneered for the establishment

of NABARD in his tenure as Finance Minister in 1979 to help farmers and rural peasantry for Agricultural and Rural Development. He is also known by the rural farmers' families as GRAM DEVTA. The INM trainees also actively participated in this programme. Vote of thanks was extended by Dr PK Yadav.

Workshop on Climate Resilient Agriculture and Soil Health Management

On December 5th, one-day workshop on "Climate Resilient Agriculture and Soil Health Management" was organized under World Soil Day at Krishi Vigyan Kendra, Bhagalpur. On the occasion, inaugurator-cum-chief guest was Ali Ashraf Siddiqui, MLA Nathanagar. The program was chaired by Hon'ble Vice-Chancellor of Bihar Agricultural University, Sabour. On this occasion, the MLA Nathanagar called upon the farmers to save the soil while maintaining its health, and motivated the farmers to save water. On this occasion, soil health cards were distributed to the farmers of various blocks of the district. The MLA also said that along with distributing the card to scientific farmers, they should also inform about its use and benefits. He requested the farmer to get the soil tested on time and keep the fertility of the soil using the fertilizer recommended in the card.

The Vice-Chancellor mentioned that the soil is on the verge of getting sick. It is important to keep this healthy, because soil is the basic basis of life. He told the farmers to be aware of soil health. A healthy crop without healthy soil cannot be imagined. He made highlight the farmers to implement the advice of agricultural scientists. He also said that life takes place in the soil, if the soil is ill, then we cannot hope for a good harvest. He said that research by agricultural scientists would prove to be a boon for farmers. Talking about crop diversification, which is very important to keep the soil healthy. He also said that we should use organic fertilizers to make soil healthy. Director Extension Education

made a mention that under the Agricultural Smart Village scheme under Bihar Agricultural University, the scheme is being implemented in 25 villages (15 Bhagalpur and 10 Munger) and soil condition of selected villages is being investigated under the scheme. The soil health card will be made available to farmers after inspection. At the same time, he inspired all the farmer brothers to get the soil of their field tested and to increase the fertility of the soil using the recommended fertilizer.

During his welcome address, the Senior Scientist and Head of KVK Bhagalpur threw light on the work going on in the weather friendly agriculture and climate smart villages. At the same time, calling upon the farmers to save the soil, emphasize the importance and use of organic fertilizers, vermicompost, bio-fertilizers in the care of its health.

BAU Scientists Visited Tal Areas of Patna for Scouting Pest and Disease Analyses

On December 24th, a technical team of scientists visited the Tal areas of Patna district for monitoring the current situation of the crops, and thereby to provide necessary advice to the farmers. The technical team comprises with Dr Kiran Kumari (Entomology), Dr Abhijeet Ghatak (Plant Pathology) and Dr Anand Kumar (Plant Breeding and Genetics). Additionally, Mr Brajesh Patel (KVK Barh) and Mr Rajkishore Roy (PRC Mokama) joined the team. The team visited several Tal areas like Gogi Tal, Mallikothi Tal and Chauhar Mal Tal, and observed different crops like lentil, field pea, chickpea and mustard. The field emergence and establishment of all the crops were satisfactory. At all farmers' fields, the crops were found uniform. However, in a few pockets, some weed problems came into notice. At some places, a soil-borne disease, called Collar Rot, was observed with 1-3% incidence. The pathogen of this disease is Sclerotium rolfsii which infects the jointing portion of the stem and main root. At the present situation, farmers may not go for management practice; if the incidence percent rise above 5% the following practice may be adopted. The team suggested for the management of this disease with light drenching method using of 2.5-3.0 g of Carbendazim per litre of water. The same practice will be repeated after 10 days using 2.5-3.0 ml of Hexaconazole in a litre of water as light drenching. The current method of light drenching was repeatedly explained. The farmers were advised to use chemicals of recognised and reputed companies. They were made aware to avoid purchasing of fake products. The practice should be followed in the affected plants and their surrounding populations. The method is applicable

for most of the soil-borne pathogens infecting pulses. As advisory and thumb rule, the team also suggested the concerned farmers for proper seed treatment with the proper procedure before sowing from next year onwards. The meagre evidence of Cut Worm has been seen in a few fields. The team suggested for using the insecticide, Emamectin Benzoate 5 SG. The application should be done using 2.0 g per 5.0 litre of water following the spraying method. In case of poor growth of the crops, the farmers were advised for spraying application of NPK mixture (19:19:19) and micronutrient using 8.0 g and 3.0 g in a litre of water, respectively. The farmers were regularly in connection with the scientists; at present they are satisfied with crops' status.

Publications

Ranjan, T., Pal, A.K., Prasad, B.D., Kumar, R.R., Kumar, M., and Jambhulkar, S.S. (2020) Reassessing the mechanism of genome encapsidation in smaller plant viruses with lessons from ATPase folds. Australasian Plant Pathology (DOI: 10.1007/s13313-020-00772-y)

Rajarshi, K., Khan, R., Singh, M.K., Ranjan, T., Ray, S., and Ray, S. (2020) Essential functional molecules associated with SARS-CoV-2 infection: Potential target for COVID-19. Gene 18:145313. (DOI: https://doi.org/10.1016/j.gene.2020.145313)

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