ICAR–Central Potato Research Institute Newsletter

Number 63 January–March, 2016

ICAR-CPRI gets New Director

Dr. Swarup Kumar Chakrabarti has joined as the new Director of ICAR-CPRI, Shimla on 27.01.2016. He had been working as Director, ICAR-CTCRI, Thiruvanantha puram, Kerala since 2012 till date. He took over the charge from Dr. Bir Pal Singh, the former Director. Dr. Chakrabarti did his B.Sc (Agri.) Hons from Bidhan Chandra Krishi Viswavidyalaya, Kalyani, West Bengal and obtained his master's degree and Ph.D from Indian Agricultural Research Institute, New Delhi. He has research experience for over 30 years in potato and other tuber crops.

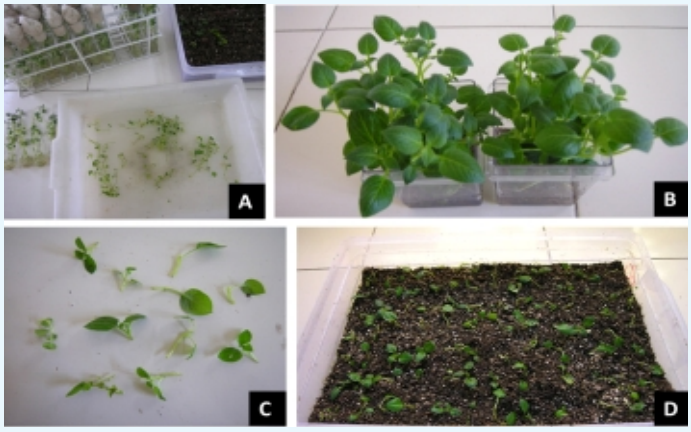
Being an eminent Biotechnologist Dr. Chakrabarti is having more than 200 scientific publications to his credit. Among these are more than 83 National and International research papers, 7 scientific reviews, 1 Book, 13 Book Chapters and 41 other scientific articls. He is recipient of many prestigious awards like Dr. LC Sikka Endowment Award 2015 of NAAS, Dr. S Ramanujam Award 2014. Besides, Dr. Chakrabarti is the Fellow of National Academy of Agricultural Sciences, New Delhi, Indian Phytopathological Society, New Delhi and Indian Potato Association, Shimla All the Institute staff of ICAR-CPRI wishes Dr. Chakrabarti all the best for his new assignment and tenure as Director of the Institute.

Research Highlights

Photoautotrophic Micropropagation: A Farmer Friendly Technology for Rapid Multiplication of Microplants

The widespread adoption of tissue culture in 1970's or micropropagation for rapid multiplication of disease-free plants provided the fast means of producing healthy seed tubers for farmers. In this technique the disease free plants are identified and multiplied in laboratory using tissue culture to derive microplants or microtubers which are then grown in net house subsequently to get minitubers.

However, micropropagation of plantlets is costly, requiring sophisticated technology and well-trained staff. In many developing countries, simpler and less expensive ways of propagation are needed. In view of the above limitation, a photoautotrophic micropropagation technique was developed. The explants of single nodes with minimum one attached leaf from disease-free planting material are cultured in suitable supporting medium (Fig A) in a tissue culture room (aprox 50-60 µmol/m^2/s PAR from white fluorescent lights and temperature of 22 ± 2° C and with 16 hr photoperiod). While high humidity is maintained during initial stages of culture to promote explant establishment by incubating in closed containers, the plants once established are allowed to grow photoautotrophically in the later stages. The developing plantlets are provided nutrient medium in the form of liquid MS (without carbon source/ sugar), which is drenched to the



Steps of photoautotrophic micro propagation: A: deriving of explant from disease free source material and its culture on supporting medium; B: Photoautotrophic plants derived after 20-25 days culture; C: Single node cutting of photoautotrophic plants with minimum one leaf for reculture D: culture of nodal cuttings on supporting material

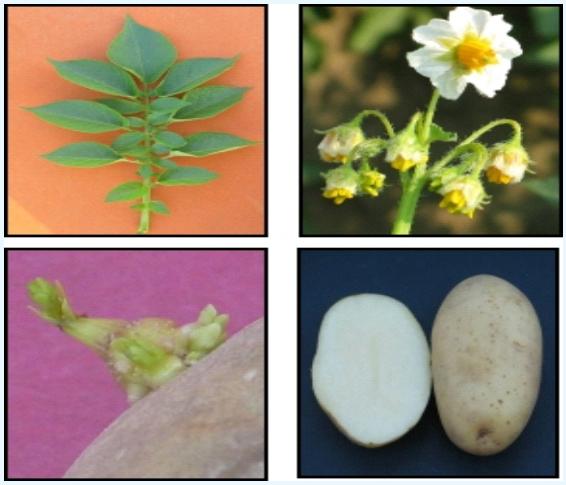
sterilized supporting medium at 60% of its water retention capacity calculated on the basis of medium composition. The planting density of more than 400 plants/m^2 can be achieved in this technique. Healthy plants are observed after about 20-25 days of culturing (Fig. B), which are again sub-cultured to form upto 5 single node cuttings with one leaf (Fig. C) and cultured on sterilized supporting medium (Fig. D). Photoautotrophic micropropagation of two varieties Kufri Jyoti and Kufri Chipsona-1 yielded survival of 95 to 100 % on the supporting medium. The mean shoot lengths, *Leaf flowers, sprout and tubers of MP/6-39* root lengths, number of leaves, fresh weight and leaf area of the plants were recorded to be 13, 7.9, 9.22, 0.71 gm, 3.88 cm^2, respectively for variety Kufri Jyoti and 13.17, 6.85, 11, 0.68 gm and 3.67 cm^2, respectively for Kufri Chipsona-1.

This technique of photoautotrophic micropropagation allows multifarious advantages over tissue culture which include ease of culture, farmer-friendly technology, nil contamination as sugar/ carbon source is excluded and rapid multiplication rates yielding sturdier plants. The plants show better acclimatization to external environment as they are already well adapted to carry out photosynthesis i.e. have well developed root, shoot, leaf and conduction system unlike tissue culture plants, which rely on nutrition medium for their survival. The plants of photoautotrophic micropropagation are already in the hardened stage and can be directly channeled to net houses and aeroponics system for seed production. The technique produces plantlets at the same rate as *in vitro* propagation at a fraction of the cost. However, it is essential that the disease-free starting plant material is kept *in vitro* and all standard phytosanitary measures are followed throughout the propagation process.

Ratna Preeti Kaur, J S Minhas & BP Singh

Multipurpose advanced potato hybrid MP/6-39 with excellent keeping quality

In India, out of the total potato production, about 68% is utilized for table purpose, 7.5% for processing; 8.5% for seed and remaining 16% produce goes waste due to pre and post-harvest losses. Potato is a perishable commodity and its harvest time (Feb/March) in subtropical plains coincides with steep rise in temperature. Therefore, potatoes have to be either consumed within a short period or is required to be shifted to the cold stores. Diversification of potato consumption was widely discussed as a tool for avoiding situation of potato over-production. However, the Indian food habits which account for very high proportion of potato consumption as vegetable, was an impediment. High yielding varieties with multipurpose uses as table and processing purpose with ability to withstand under country store or ambient conditions for 60-75 days can be another tool to minimize the post-harvest losses. Breeding efforts in this direction led to identification of advanced stage hybrid MP/6-39 with high yield, excellent organoleptic, processing and keeping quality attributes. The hybrid derived from cross Kufri Himsona x Kufri Pukhraj during 2006 possesses moderate-high tuber dry matter with low reducing coincides with steep rise in temperature. Therefore, potatoes have to be either consumed within a short period or is required to be shifted to the cold stores. Diversification of potato consumption was widely discussed as a tool for avoiding situation of potato over-production. However, the Indian food habits which account for very high proportion of potato consumption as vegetable, was an impediment. High yielding varieties with multipurpose uses as table and processing purpose with ability to withstand under country store or ambient conditions for 60-75 days can be another tool to minimize the post-harvest losses. Breeding efforts in this direction led to identification of advanced stage hybrid MP/6-39 with high yield, excellent organoleptic, processing and keeping quality attributes. The hybrid derived from cross Kufri Himsona x



Leaf flowers, sprout and tubers of MP/6-39

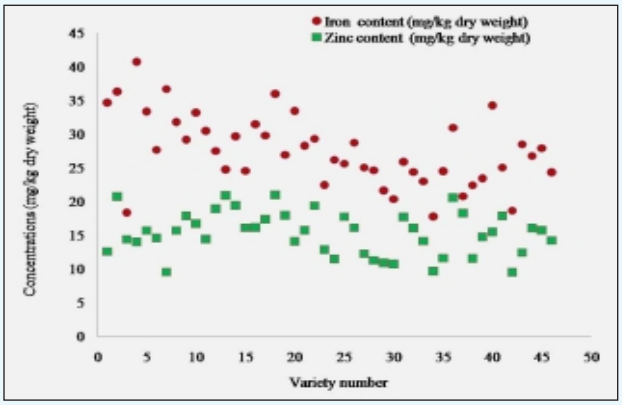
Kufri Pukhraj during 2006 possesses moderate-high tuber dry matter with low reducing moderately resistant to late blight and has waxy texture, pleasant flavour and excellent organoleptic taste on boiling. Results on storage behaviour over three year (2014-16) revealed that advanced hybrid MP/6-39 have long dormancy period as it did not sprout even after 75 days of storage and also have minimum total weight loss (9.6%) as compared with Kufri Chipsona-3 (17%) and Kufri Frysona (11%). The produce of MP/6-39 can be exported to long distances owing to its long dormancy period and excellent keeping quality. The superior organoleptic and processing attributes of MP/6-39 makes the hybrid multi-

purpose for use as table purpose in cooler regions and for chips/French fries in warmer region of the country. The multi-purpose advanced potato hybrid MP/6-39 can be helpful in expanding the potato production and its utilization in country.

VK Gupta, Vinay Bhardwaj, SK Luthra, SV Singh, Ashiv Mehta, Bandana & BP Singh

Micronutrient content of Indian potato varieties

Micronutrients particularly iron and zinc are vital for growth, development, and maintenance of the immune system. Deficiency of these micro nutrients cause hidden hunger and affects physical and mental health. One third of the world population especially women and infants of developing nations suffer from deficiency of either one or both the micro nutrients. In view of huge cost and less feasibility involved in mineral supply by supplementation or food fortification, the concept of biofortification through conventional plant breeding tool holds the promise of meeting the malnutritional challenges of common mass to an extent. Focus of mineral biofortification in potato is important as it is among the top four most consumed food crop.



Distribution pattern micronutrients (Fe & Zn) in 46 potato varieties

Potato micronutrients bioavailability is high due to negligible anti-nutritional factors and substantial amount of promoter content. Significant genetic variation and heritability for iron and zinc content strengthens the concept of potato micronutrient content enrichment through breeding approaches.

Per capita availability of fresh potatoes in India is about 20 kilogram (approx. 4 kg on dry weight basis) as per 2010 estimates. The analysis of mineral content in commercial and released varieties forms the baseline for further research in this aspect and raises the possibility of enhancing the mineral fraction of new varieties by stringent selection among germplasm. Information in respect of micronutrient content in Indian varieties is lacking. In view of the potentiality of potato as source of bioavailable minerals for food nutrition, the minerals content in the tubers of forty six important Indian potato varieties was determined to generate first-hand information of zinc and iron content. Iron content ranged between 17.75 to 40.74 (average 27.53) and zinc content between 9.54 to 21.00 mg/kg (average 15.29) on dry weight basis in potato flesh with positive and significant correlation ($r=0.33$, $p<0.05$) between the two traits suggesting that improvement for both traits simultaneously is feasible and is being attempted through the Institute Flagship programme.

Dalamu, Jagdev Sharma, Brajesh Singh, VK Gupta, VK Dua & Vineeta Sharma

Yield gap analysis of potato based on demonstration of late blight and cutworm management in UP

Yield gap generally refers to the difference between potential farm yield obtained at demonstration plots and actual yield obtained at farmer's field using existing practices. This gap in yield arises because farmers use inputs or practices other than optimal resulting in lower yield. Present study was undertaken during year 2013-14 to assess the existing yield gap in potato based on demonstration of plant protection technologies. A total of 10 field demonstrations, 5 each on late blight and cutworm management technology were laid out at different locations *viz* Agra, Hathras, Moradabad, Hapur, Bagpat, Saharanpur and Shahjahanpur districts of UP at farmer's field. Recommended management practices were used to control late blight and cutworm in demonstration plot. The results were compared with existing practices of farmer's i.e. local check where faulty or no management practices were used by farmers. The average intensity of late blight in demonstration plot was 0-5% while 10-22% intensity was recorded in local check. Similarly, in case of cutworm management demonstration plot, there was no infestation of cutworm due to use of recommended doses of chemical while in local check, intensity of pest varied from 1.5 to 2.5%.

The demonstrations plot under late blight management yielded 29.1 t/ha which was 10.2% higher than local check (26.4 t/ha). Similarly, in case of demonstration plot of cutworm management, yield was 31.5 t/ha which was 14.5%

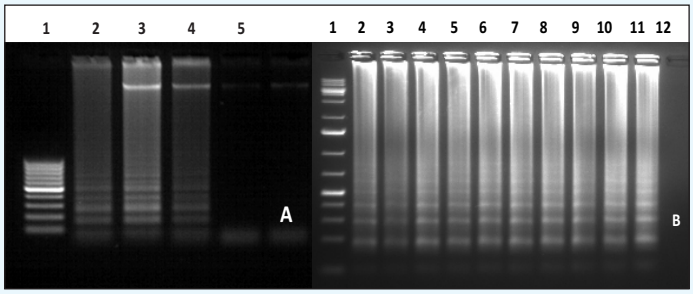
Cutworm infected tubers *Late blight infected tubers*

higher than local check (27.5 t/ha). Thus there was yield gap of 10-15% as a result of non-adoption of late blight and cutworm management technologies.

NK Pandey, Dhiraj K. Singh & Ashok Chauhan

Loop mediated isothermal amplification detection of virus causing apical leaf curl disease

Apical leaf curl disease is one of the important viral diseases caused by a whitefly transmitted begomovirus, *Tomato leaf curl New Delhi virus-potato* (ToLCNDV-potato) in potato. Detection of this virus is very much essential to manage the disease, particularly in healthy potato seed production system. Several techniques like ELISA, PCR and RCA are available for its detection. PCR is being used to screen mother plants meant for tissue culture based seed production and also stage I plants in healthy potato seed production. Recently, isothermal amplification methods have been developed for several pathogens infecting plants which have the potential to overcome some of the cost barriers limiting uptake of PCR-based testing while exceeding the sensitivity and/or specificity of ELISA-based methods. Hence, we developed loop-mediated isothermal amplification (LAMP) method for specific detection of ToLCNDV-potato. LAMP reactions are rapid, highly efficient and are carried out under isothermal conditions (60–65°C) which produces large amount of DNA (amplified 10^9–10^{10} times) in 15–60 min. Most



LAMP detection of ToLCNDV-potato in known (A) and unknown field samples (B). A. Lane 1. 100 bp ladder, Lane 2-4. Positive samples, Lane 5-6. Negative samples. B. Lane 1. 1 kb ladder, Lane 2-11. Field samples infected with ToLCNDV-potato, Lane 12. Negative sample.

importantly, gene amplification can be visualized by the naked eye either as turbidity or in the form of a colour change when SYBR Green is employed. LAMP does not require a thermal cycler and can be performed simply with a heating block and/or water bath. In this study, LAMP primers were designed from the coat protein gene region of ToLCNDV-potato and used along with *Bst* DNA polymerase in a thermal cycler set to isothermal condition. Temperature, time, concentration of primers, $MgSo_4$, Betaine and dNTPs were optimized for sensitive and specific detection of ToLCNDV-potato. The developed LAMP assay successfully detected ToLCNDV-potato in leaf samples collected from potato fields.

Jeevalatha A, Ravinder Kumar and Baswaraj Raigond

Transfer of Technology

Awareness camp on 'Potato Cultivation' organized at village Jassi, Sunni, Shimla

The institute organized one day awareness camp on "Potato cultivation" on 15 March 2016. A total of 92 progressive farmers from nearby area participated in this camp. Scientists from CPRI, Shimla delivered lectures on agronomic requirements, fertilizer application and disease and pest management aspects of potato production. Free leaflets and extension bulletin related to potato technologies were distributed among these farmers.

Exposures Visit of Farmers at ICAR-IARI, New Delhi

The Institute organized an Exposures Visit of 10 farmers from Shimla district to ICAR-IARI, New Delhi during 19-21 March, 2016 in Krishi Unnati Mela. They visited more than 100 stalls of different public and private sector organizations involved in agriculture research and development. They were benefitted by enhancing their awareness on recent developments in the field of agriculture and allied sector.

Field demonstration at Mujaffarnagar (UP)

A Field demonstration was organized under the Agricultural Research and Development Programme on the fields of selected farmers of the adopted villages – Dudhli, Sohjani tagan and Kamaalpur of Mujaffarnagar district, where the major crop is Sugarcane. The Scientists/Officials from CPRIC, Modipuram monitored the demonstrations in coordination

with Agriculture Scientific Centre, Baghra, Mujaffarnagar. During the programme, all types of activities like preparation of field, use of pesticides/insecticides were performed by farmers themselves and CPRIC, Modipuram distributed material like potato seed, fertilizer, pesticides/insecticides amongst the farmers free of cost.

Potato seminar at Farukhabad

Two days seminar on potato in association with National Horticulture Mission, Govt. of India was organized at Farukhabad (U.P). The programme was organized in two sessions during the Magh fair on 12 & 13 February, 2016. About 500 farmers participated in the said seminar. In both the sessions, the scientists from CPRIC, Modipuram detailed the farmers about Scientific Cultivation of potato.

Potato training programme at Modipuram

One day training programme on vegetative identification of potato varieties was organized at CPRIC, Modipuram. Six supervisory officers from M/s Merino Industries participated in this training programme. During the programme, the important vegetative features of potato varieties developed by CPRI were detailed to the officers for identification of various potato varieties. During the training, a detailed information was given to trainees about the contribution of Institute in Research and Development of Potato & different features of potato varieties.

Training of officials from Merino, Hapur

Live Phone- in Prgramme at Doordarshan

Scientists from CPRI, Shimla participated in the Live-phone programmes on different subjects on Doordarshan from January to March, 2016. The details of the topics along with experts are given below.

Month	Topics (Live phone in on Doordarshan)	Name of the Expert
January	Varietal requirement, Planting and fertilizer application in potato in mid hills of HP	Dr. Vinod Kumar Dr. Dalamu
February	Intercultural operations and harvesting of potato in HP	Dr. Ashwani Kumar Dr. Brajesh Singh
March	Disease and pest management in potato in mid hills of HP	Dr. Sanjeev Sharma Dr. Venkateswarlu V.

Important Meetings, Events & Visitors

Hon'ble Parliamentary Committee on Official Language visited Gwalior

The second sub-committee of the Parliamentary Committee on Official Language visited the ICAR-Central Potato Research Station, Gwalior for review meeting on 5th February, 2016 to inspect the Rajbhasha Hindi Work being carried out at the Station. Director, Central Potato Research Institute highlighted the potato research work and the achievements

Welcome of Parliamentary committee by Director

of the institute and the Head of station apprised the members about the research and Hindi work being carried out at this station. He assured the committee members that institute and center will strictly adhere to comply with Rajbhasha

Parliamentary committee visiting potato exhibition

Adhiniyams. An exhibition of potato literature in Hindi and the potato varieties and products was also laid out during this meeting. The members of the Committee appreciated the research work and achievements made by the institute and the Center. The Hon'ble members of Parliamentary Committee suggested that myths with regard to potato consumption leading to obesity and diabetes must be removed by bringing out popular write-ups in Hindi for common mass.

DG visits ICAR-Central Potato Research Station, Patna

Dr. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR visited ICAR-Central Potato Research Station, Patna on 5th March, 2016. He was accompanied with Dr. JS Sandhu, DDG (Crop Sciences) and Dr. BP Bhatt, Director, ICAR-RCER. Dignitaries went around the campus to assess the progress of various activities of the station. They visited experimental plots particularly varietal demonstrations,

aeroponic system and tissue culture lab. Head of the station briefed them about various ongoing research, extension and other activities at the station. In his address, Dr. Mohapatra said that he was very happy with the recent achievements of the station, especially with the production of good quality seeds for the eastern plains. He advised scientists to take the challenges for addressing the present agricultural problems in multidisciplinary collaborative manner with ICAR-RCER and other similar working institutes. He also emphasized that young scientists should work on emerging issues like nutritional value, climate change, etc in participatory mode.

Institute IMC meeting at Modipuram

Institute IMC meeting was organized at CPRIC, Modipuram on 29th March, 2016. Dr. SK Chakrabarti, Director welcomed the distinguished members of Institute Management Committee at the start of the meeting. During the meeting, Head of the Administration, read the agenda points in front of the members, on which, IMC members had an affirmative discussion. At the end of the meeting, Dr. Vinay Singh, PS made a presentation on Aeroponics technology and was appreciated by all the members. All the IMC members visited the different potato seed production units at the campus.

MoU signed for two CPRI technologies

MoU for the technology entitled "Dehydration of potatoes" was signed during the year for commercialization on non-exclusive basis as per the guidelines of ICAR with two parties namely M/s Goli Wala Foods, Ghatlodia, Ahmedabad - 380 061 and M/s. Sunripe Agro Products Ltd. Hyderabad 500 020. CPRI signed MoU for another technology entitled "Processing of potatoes into chips, French fries and other products" with M/s Goli Wala Foods, Ghatlodia, Ahmedabad - 380 061 in March, 2016. Main objective of the MoU is the value addition of potato on large scale, which will result in increased potato utilization, solve the problem of storage and help the farmers by getting remunerative prices.

Human Resource

Scientific

Joining

1. Dr. SK Chakrabarti, Director, CTCRI, Thiruvananthapuram joined as Director, ICAR-CPRI, Shimla on 27.1.2016 (AN).

Promotions

1. Dr.(Mrs.) Pinky Raigond, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f. 28.4.2014.
2. Dr.(Mrs.) Bandana, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f. 11.05.2014.
3. Dr. Baswaraj Raigond, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f. 04.11.2013.
4. Dr. Sundresha S, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f. 01.9.2014.
5. Dr. MS Gurjar, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f 01.9.2014.
6. Dr. Dhiraj K Singh, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f. 20.04.2014.
7. Sh. VU Patil, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f 10.02.2014.
8. Dr. Sanjay K Yadav, Scientist from RGP of Rs. 6000/- to Rs. 7000/- w.e.f. 20.04.2014.
9. Dr. Murlidhar Sadawarti, Scientist from RGP of Rs.6000/- to Rs. 7000/- w.e.f. 26.6.2014.

Transfers

1. Dr. SK Kaushik, Principal Scientist, CPRIC, Modipuram to NBPGR, New Delhi w.e.f. 11.1.2016 (AN).
2. Dr. Prashant G Kawar, Sr. Scientist, CPRI, Shimla to Directorate of Floricultural Resaerch, Pune w.e.f. 12.2.2016 (AN).
3. Sh. Amit Kumar Singh, Scientist, CPRI, Shimla to IGFRI, Jhansi w.e.f. 05.03.2016 (AN).
4. Smt. Suman Lata, Scientist, CPRIC, Modipuram to IARI, New Delhi w.e.f. 05.03.2016 (AN).
5. Dr.(Ms.) Aarti Bairwa, Scientist, CPRS, Ooty to CPRI, Shimla w.e.f. 22.02.2016 (AN).

Technical

Promotions

1. Sh. RK Verma, CTO, CPRIC-Modipuram w.e.f. 2.12.2009
2. Smt. Tarvinder Kochhar, ACTO, CPRI, Shimla. w.e.f. 8.6.2015
3. Smt. Shelly Chopra, ACTO, CPRI, Shimla w.e.f. 23.1.2015
4. Sh. Dharminder Verma, ACTO, CPRI, Shimla w.e.f. 15.6.2015
5. Sh. Kapil Kumar Sharma, ACTO, CPRS, Jalandhar w.e.f. 23.2.2015
6. Dr. SBS Prihar, Ex-ACTO, CPRIC-Modipuram w.e.f. 1.1.2010
7. Dr. Kopil Dey, Ex-ACTO, CPRS, Patna w.e.f. 1.1.2011

Retirements

1. Sh. Jagdish Chand, Technical Officer, CPRS, Jalandhar retired on 31.01.2016
2. Sh. Prakash Chand, Sr. Tech. Asstt. CPRI, Shimla retired on 31.3.2016

Administrative

Promotions

1. Sh. Chanda Ram, Assistant, CPRI, Shimla promoted to the post of Asstt. Admn. Officer w.e.f. 13.01.2016
2. Smt. Sandhya Kapila, UDC, CPRS, Jalandhar promoted to the post of Assistant w.e.f.13.01.2016 (AN)
3. Smt. Shyam Lata Beakta, UDC, CPRI, Shimla promoted to the post of Assistant w.e.f.13.01.2016
4. Sh. Tej Singh, LDC, CPRI, Shimla promoted to the post of UDC w.e.f. 18.01.2016
5. Smt. Geeta Devi, LDC, CPRI, Shimla promoted to the post of UDC w.e.f. 09.02.2016
6. Smt. Shashi Bala Thakur, Personal Assistant, CPRI, Shimla promoted to the post of Private Secretary w.e.f. 09.02.2016
7. Sh. KC Chopra, Assistant, CPRI, Shimla promoted to the post of Asstt. Admn. Officer w.e.f. 26.02.2016

Retirements

1. Sh. Roshan Lal, AAO, CPRI, Shimla retired on 31.01.2016
2. Sh. HK Sen, Private Secretary, CPRS, Patna retired on 31.01.2016

Skilled Supporting Staff

Regularization of Casual Workers as SSS in PB of 5200-20200 w.e.f. March, 2016

1. Sh. Lala Ram
2. Smt. N. Anagamma
3. Sh. Munna Singh
4. Sh. Kali Charan
5. Sh. Tilak Singh
6. Smt. Sodha Devi
7. Sh. Net Ram
8. Sh. Mangal
9. Sh. Jandel Singh
10. Sh. Bhagirath
11. Sh. Rajinder Singh
12. Sh. Ramdin
13. Sh. Sikander Singh

Granted IInd MACP to SSS

1. Smt. Rashpal Devi, Skilled Support Staff, CPRS, Jalandhar w.e.f.15.2.2014.
2. Sh. Jagtey, Skilled Support Staff, CPRIC, Modipuram w.e.f. 06.10.2014.
3. Sh. Sanjeevan Kumar, Skilled Support Staff, CPRI,Shimla w.e.f. 26.10.2014.
4. Sh. Ram Lubhaya, Skilled Support Staff, CPRS, Jalandhar w.e.f. 02.6.2015.
5. Sh. Jagat Kumar, Skilled Support Staff, CPRS, Patna w.e.f. 13.6.2015.

Retirements

1. Sh. Ashok Kumar Dev, Skilled Support Staff, ICAR-CPRS, Shillong retired on 29.2.2016.
2. Sh. Shiv Nath Singh, Skilled Support Staff, ICAR-CPRS, Patna retired on 29.2.2016.

From the Director's Desk

Bioinformatics is the application of computer technology to the management of biological information. Computers are used to gather, store, analyse and integrate biological and genetic information. It is an interdisciplinary field that develops methods and software tools for understanding biological data. As an interdisciplinary field of science, bioinformatics combines computer science, statistics, mathematics, and engineering to analyze and interpret biological data. Bioinformatics has been used for in silico analysis of biological queries using mathematical and statistical techniques.

Common uses of bioinformatics include the identification of candidate genes and nucleotides (SNPs). Often, such identification is made with the aim of better understanding the genetic basis of disease, unique adaptations, desirable properties or differences between populations. In a less formal way, bioinformatics also tries to understand the organisational principles within nucleic acid and protein sequences.

At ICAR-CPRI the Bioinformatics activities were initiated on partnering with International Potato Genome Sequencing Consortium (PGSC) and sequencing of Potato Chrosome no. 2. Currently the Institute has different platforms available to sequence, assemble and annotate the organisms ranging from ROCHE 454 to Illumina and Ion Torrent. ICAR-CPRI is also part of Centre for Agricultural Bioinformatics (CABin) and uses the resources like software/workflow/pipelines on ASHOKA at ICAR-IASRI to automate routine biological analytics in seamless manner. With the present capacity and infrastructure building on bioinformatics, I am sure that the Institute shall be able to progress on functional genomics of potato in the field of gene discovery, cloning, SNP sequencing and genome editing.

Compiled and edited by: Brajesh Singh, Ravinder Kumar, Dhiraj K. Singh, Pinky Raigond and R.M. Sharma
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