



ICAR – Central Potato Research Institute

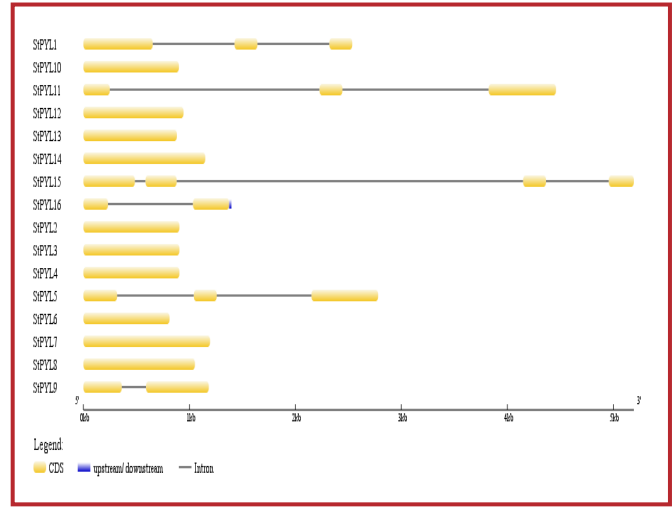
Newsletter

Number 78 October-December, 2019

Research Highlights

Exploring StPYL gene family for imparting multiple abiotic stress tolerance in potato

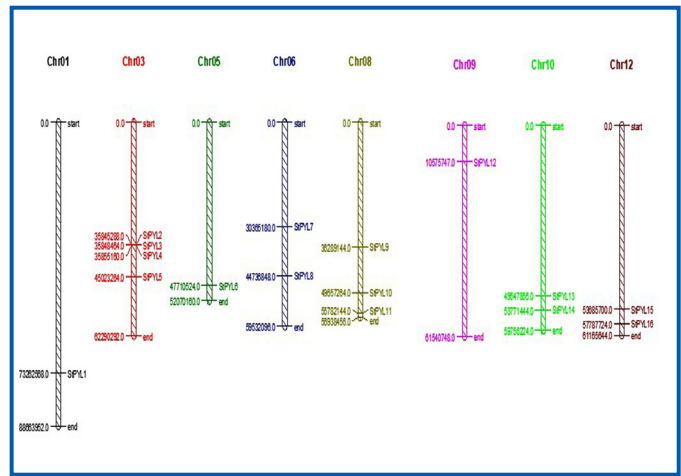
Potato production is severely affected by various abiotic stresses like high temperature, drought and salinity. Experimental evidences suggest that Abscisic acid (ABA) and its receptors, mainly PYL (Pyrabactin



Gene structure showing the exon-intron boundaries of StPYL family genes in potato

Resistance - Like Abscisic Acid Receptors) plays an important role in modulating the cell metabolism for tolerance to various abiotic stresses. PYL genes family is well characterized in other plants like Arabidopsis, rice, tomato, poplar and maize but to date, this gene family is not explored in potato for its potential to provide abiotic stress tolerance. Hence, we have performed the genome-wide identification and digital expression analysis of the PYL gene family in potato using the orthologous sequences information. In silico analysis mined a total of 16 genes from the potato genome named as StPYL1 to StPYL16 based on their

chromosomal location. The results also indicated that StPYL1 and StPYL5 and StPLY15 to play an important role in overcoming abiotic stress by overexpressing 180, 85 and 80 folds, respectively. These are taken as potential targets for imparting abiotic stress tolerance in potato through breeding and biotechnological approaches.

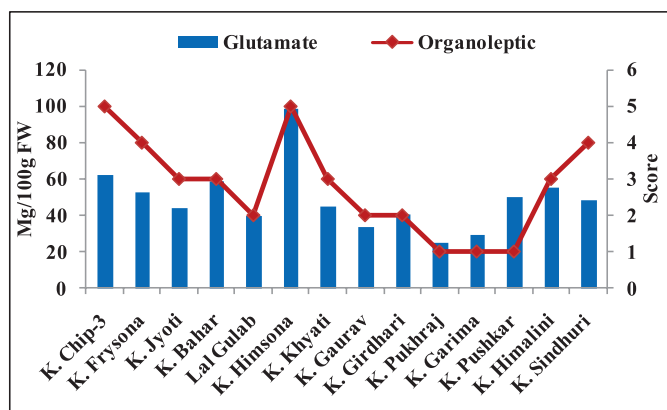


Chromosomal location of StPYL genes

KN Chourasia, HB Kardile, VU Patil, V Bhardwaj, MK Lal, RK Tiwari, Dharmendra Kumar & Subhash S

Glutamate: An indicator of potato flavour

The major umami compounds reported in potatoes are 5' nucleotides mainly adenosine monophosphate and guanosine monophosphate, and amino acids, glutamate, and aspartate. Among these umami compounds, glutamate and guanosine monophosphate contribute significantly towards taste. Glutamic acid imparts little taste, whereas its salt glutamate gives clear umami taste due to the ionized state. Evaluation of glutamate from a large number of samples is possible through YSI Biochemistry analyzer, where only water extract of cooked tuber is required. In

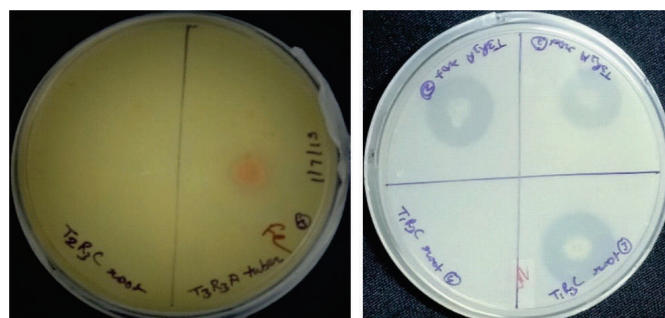


raw tubers of fourteen tested varieties, glutamate content ranged from 4 to 24 mg/100g FW. Cooking has shown a significant increase in glutamate content. On average, boiling has increased the glutamate content to 79%, whereas the increase reported after microwaving was quite high (250%). Glutamate content in microwaved tubers ranged from 25 to 98mg/100g FW. Variety Kufri Himsona possessed highest glutamate content after microwaving followed by Kufri Bahar and Kufri Himalini. Organoleptic test was carried out only in microwaved potatoes. A scale of 1 to 5 is developed, where 1 is for poor/bitter taste, 2 is neutral, 3 is good, 4 is very good and score 5 is excellent. Umami taste is described as a pleasant 'meaty' taste with a mouthfeel and long-lasting after taste. Therefore, 'mouthfeel/good after-taste' was the main criteria for the evaluation of the organoleptic score. The results of the organoleptic evaluation showed an almost similar trend as that of glutamate concentration. Microwaved tubers having high glutamate content were liked by most of the panelists. Free glutamate content showed a good positive correlation (0.73) with the organoleptic score. Therefore, glutamate can be used as an indicator of potato taste.

Pinky Raigond, Tanuja Mishra, Brajesh Singh, Som Dutt, SS Changan & MK Lal

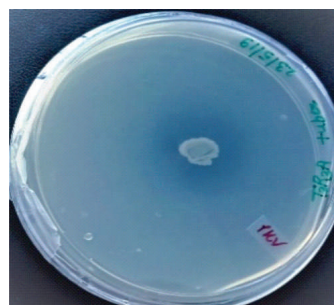
Endophytes for Sustainable Potato Production

Endophytic bacteria can benefit host plants directly by improving plant nutrient uptake and by modulating growth and stress-related phytohormones. Indirectly, endophytic bacteria can improve plant health by targeting pests and pathogens with antibiotics, hydrolytic enzymes, nutrient limitation, and by priming plant defenses. These endophytes can be used as an efficient biological plant growth promoter in sustainable crop production. Being a vegetatively propagated crop potato is continuously perpetuating a large number of microorganisms in its tuber as

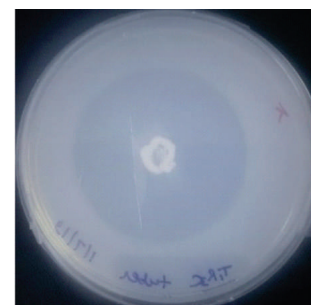


Siderophore producing bacteria

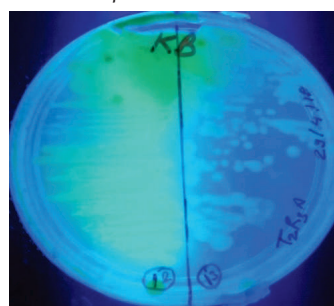
Zinc solubilizers



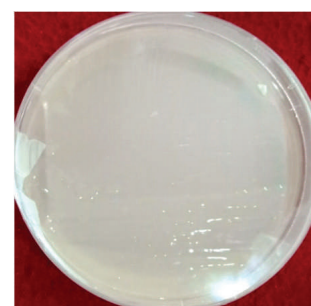
Phosphorus solubilizer



Potassium solubilizer



Pseudomonas fluorescens



Azotobacter spp.

well as in roots. Hence, there is great scope for the identification of novel endophytes from potato tubers along with root. With this aim, we have identified the endophytic isolates with the following plant growth-promoting traits viz. Siderophore producer which play an important role in iron nutrition of plant and antagonism against phytopathogens. Zinc, phosphate and potassium solubilizing microorganisms mobilize nutrients in soil and make it easily available to the crop plants, *Pseudomonas fluorescens* promote plant growth and health by suppressing soil borne diseases, by stimulating plant immune defenses, and by improving nutrient availability in soil. N fixing *Azotobacter* which converts atmospheric nitrogen to ammonia by an enzyme called nitrogenase. Further studies are being carried out for their identification and characterization through molecular and biochemical methods. This study is an early step towards sustainable potato production using the plant growth promoting endophytes.

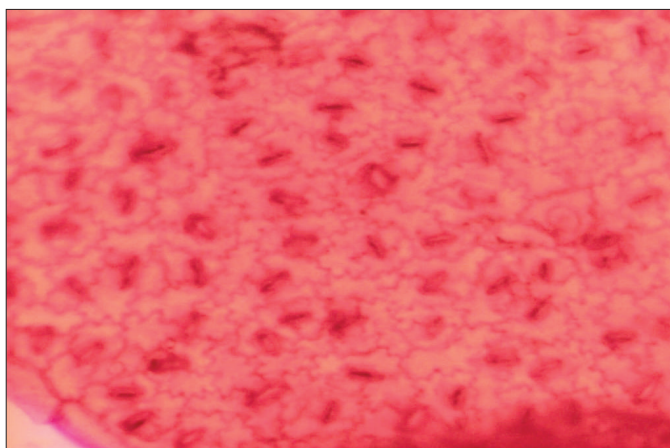
Preeti Singh, HB Kardile, S Rawal, NK Sharma, VK Dua, J Sharma, KN Chourasia, D Kumar & RK Tiwari

Physiological traits of water use efficient hybrid J.93-58

Under breeding programme, a water use efficient hybrid J.93-58 was developed. It was found to be water use efficient based on its performance over past 4 years. The yield performance of J.93-58 at various soil moisture regimes at lower doses of water and water use efficiency were found better than that of popular cultivars (Kufri Pukhraj and Kufri Bahar). The stomatal density and size (stomata length in μm) were measured under microscope after staining with safranin. Respiration rate was calculated using an apparatus connected to CO_2 gas analyser. Leaf relative water content was measured using the formula:

Relative water content = $\frac{[(\text{Fresh weight} - \text{dry weight}) / (\text{Turgid weight} - \text{dry weight})] \times 100}$

The results show that stomatal density is less in J.93-58 (239.9 mm^{-2}) as compared to Kufri Bahar (332.2 mm^{-2}) and Kufri Pukhraj (270.7 mm^{-2}). Stomatal size of J.93-58 ($33.5 \mu\text{m}$) was larger than Kufri Bahar ($30.7 \mu\text{m}$) but at par with Kufri Pukhraj ($34.1 \mu\text{m}$). Respiration rate ($\text{mg CO}_2 \text{ kg}^{-1} \text{ hr}^{-1}$) of J.93-58 was 6.97 as compared to 7.63 of Kufri Bahar and 7.18 of Kufri Pukhraj.



Stomata J.93-58

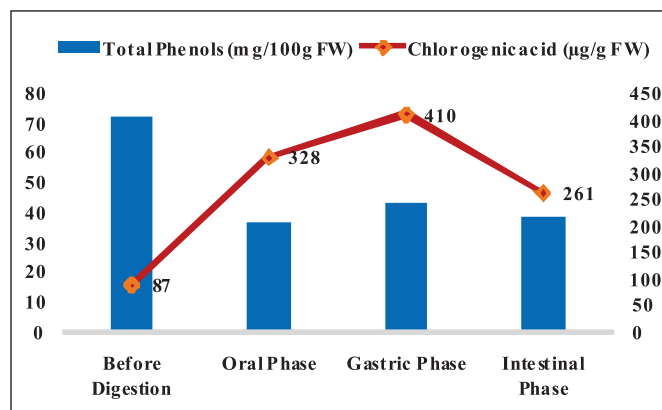
Leaf relative water content (%) of J.93-58 was 68.3 as compared to 67.8 of Kufri Bahar and 69.0 of Kufri Pukhraj. It can be concluded that better water use efficiency of J.93-58 could be due to less stomatal density.

Raj Kumar & Name Singh

Potato peel: A neglected source of highly bio accessible phenols

Huge potato peel is generated in potato processing industries that lead to disposal related problems. Potato peel is a good source of nutritional and phyto-

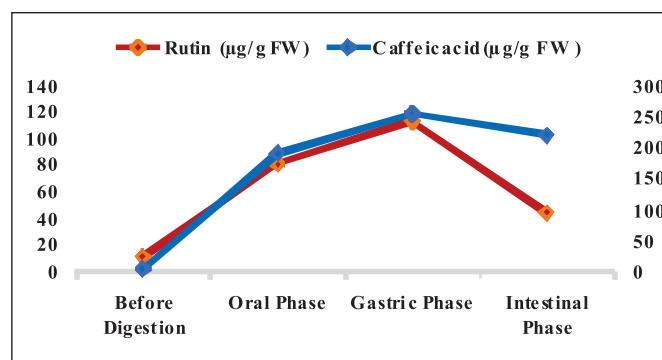
chemical compounds such as phenols, vitamin C and dietary fibre.



Bioaccessible total phenols and chlorogenic acid in potato peel after in-vitro gastro intestinal digestion

These phyto-chemicals acts as antioxidants and plays an important role in prevention of free radical formation and have anti-carcinogenic properties. Almost 50% of the potato phenols are located in potato peel and adjoining tissues and concentration of phenols decreases towards tuber pith. Bio-accessibility studies are used to get an idea about the release of phyto-chemicals from food matrix that is available for absorption in the gut. In-vitro bio-accessibility of total phenols and individual phenols (chlorogenic acid, caffeic acid and rutin) was carried out in peel of Kufri Chipsona-1, Kufri Bahar and Kufri Jyoti.

As release of total phenols and individual phenols showed similar trend for all the three varieties, the results are reported as an average. Total phenols content was found to be 72 mg/100g FW on average. After in-vitro digestion, decrease was observed in total phenols, and maximum concentration of phenols was bioaccessible in gastric phase. Chlorogenic acid was found to be the most dominant individual phenol and peel contained high concentration of chlorogenic



Caffeic acid and rutin bioaccessible content after in-vitro gastro intestinal digestion in potato peel

acid (87 µg/g FW) followed by rutin (24 µg/g FW) and caffeic acid (2 µg/g FW). *In-vitro* digestion increased the release of chlorogenic acid, caffeic acid and rutin with maximum bioaccessibility observed in gastric phase. Overall increase in chlorogenic acid was 3 fold, caffeic acid was 51 fold and rutin was 3.9 fold after *in-vitro* digestion. Results showed that potato peel contained high concentration of phenols particularly chlorogenic acid and can be used as an important source of natural antioxidant as the use of synthetic antioxidants cause harmful effects to human body. Also, the potato peel powder can be used for nutraceutical and pharmaceutical applications due to its high antioxidant and anti-carcinogenic properties to cure free radical mediated disorders.

Nitasha Thakur, P Raigond, MK Lal, Vinod Kumar, Vandana Parmar, SS Changan & Brajesh Singh

Transfer of Technology

Awareness programme on Hi-Tech Potato Seed Production held at ICAR-CPRI, RS, Jalandhar

Agri-business Incubator of Institute organized an awareness programme on 'Business Opportunities in Hi-Tech Potato Seed Production' at ICAR-CPRI, Regional Station, Jalandhar on 23rd December 2019. The purpose of this programme was to create wakefulness about potato seed production system involving tissue culture, aeroponics, net houses etc. The Scientists covered topics on minituber production technologies, promising varieties of potato, management practices for insect, pest and diseases, seed plot technique, rousing and net house cultivation for production of quality seed potatoes during the programme. Total 80 farmers from Punjab and Haryana state participated in this event and took advantage of the information given by the subject experts and hands on training in experimental crop farm



Training organized on Potato seed production and value addition at ICAR-CPRI, Shimla

A three days training programme on "Potato seed production and value addition" was organised for 25 potato growers of Mehsana district of Gujarat during 15-17 October, 2019 at ICAR-CPRI, Shimla. This programme was sponsored by Project Director, ATMA, Mehsana (Gujarat). The aim of this training was to enhance the knowledge and skill of the trainees regarding production of seed potato and value addition in potato. Training methodologies like lecture cum discussion, practical sessions, skill demonstration, field visit and video film show etc. were the modes for imparting the training to the participants.



Winter School Conducted on "Advancement in potato production technology & its future prospects" at ICAR-CPRI, RS, Modipuram

An ICAR sponsored Winter School on 'Advancement in potato production technology & its future prospects' from 19 Nov. to 09 Dec., 2019 was organized at ICAR-CPRI, Regional Station, Modipuram, Meerut (UP). Participants were from different Agricultural Universities/Research Institutes and KVKs. The inaugural function of training programme was held on November 19, 2019 and Dr. Birpal Singh, Former Director, ICAR-CPRI, Shimla graced the occasion as Chief Guest. In his enlightening speech, he stressed on use of advance technologies and techniques of potato production that could be used to meet the future need of quality potato production. During the programme, a total of 55 lectures and practicals on topics such as breeding potato varieties for processing and ware purpose, agronomic practices, balance use of fertilizers, modern methods of irrigations, potato based cropping systems, important insect pests and diseases of potato and their management and potato seed production



through traditional and advanced technology were covered. The lectures were delivered by the scientists of the Institute, ICAR-NIAP, New Delhi, ICAR-IARI, New Delhi, ICAR-IIFSR, Meerut and Sardar Vallabh Bhai Patel University of Agriculture and Technology, Meerut. On 09, Dec 2019, the concluding day, Dr. SK Chakrabarti, Director, ICAR-CPRI, Shimla was the Chief Guest of this programme. Dr. SK Chakrabarti spoken on the scenario of potato research and development in India and further suggested to participants to use advanced technologies of potato production. At the end, he distributed the Certificates to the participants.

Training on Advanced Techniques for quality potato production organized at ICAR-CPRI, RS, Modipuram

A three days training programme on Advanced Techniques for Quality Potato Production from 03-05 October, 2019 were organized for 15 farmers of Haryana and 25 farmers of Uttar Pradesh at ICAR-CPRI, Regional Station, Modipuram. During the programme, the experts delivered talks on advanced varieties of potato, advanced crop activities of potato seed crop, modern irrigation tools, balanced use of fertilizers, seed potato production, identification and



management of pests and diseases in seed potato crop, potato seed storage and potato processing etc. The concluding ceremony of the training was organized on October 05, 2019 and the chief guest of the function was Mr. Ravi Shankar Sharma, District Development Manager, NABARD, Meerut and the special guest was Mr. Sanjay Kumar of Syndicate Bank, Meerut. In his address, the Joint Director called upon the farmers to reduce their costs and said that the farmers can increase his income only by reducing his cost. He also advised farmers to get in touch with the scientists of the Institute to resolve their problems.

Training on Capacity building Programme towards a secure & resilient workplace organized at ICAR-CPRI Shimla

A first of its kind training for personnel associated with security in ICAR system was held at ICAR-CPRI, Shimla from 25th to 27th November 2019. Around 35 participants from ICAR institutes located all over the country participated in the 3 days training programme. Course Director, Dr SK Chakrabarti welcomed the participants and expressed his views on importance of Security in modern times as well as on the deliverables of the training programme. The multifarious aspects of security challenges in ICAR institutes like Fire safety, emergency evacuations, disaster management, Cyber security, Security acts, contracts, labour laws, wild life acts, Security equipments, First aid methodologies, mock drills as well as behavioural aspects of security were dealt in details. The mode of delivery included not only the lectures but also role plays & field demonstration which are crucial in the realm of security. Faculties included experts from Army, Sh. Asif Jalal, DIG Police (Southern Range) Shimla, Sh. DC Sharma, Divisional Fire officer, a disaster expert from NDTV, a retired faculty from ICAR apart from in-house faculty on Cyber security in form of Dr Shashi



Rawat. Sh. Sandeep Singh Dudi, Administrative Officer apart from taking lectures on General aspects of security, Security agencies & laws also coordinated the training programme.

Live Phone-in Programme at Doordarshan

Scientists from ICAR-CPRI, Shimla participated in the live-phone programmes during Oct. to Dec. 2019. The details of the topics along with experts are given below.

Month	Topics	Name of the Expert
October, 2019	"Diseases and insect pests of potato and their management"	Dr. Ravinder Kumar
	"Cultivation of potato in Himachal Pradesh"	Dr. Dalamu

Important Meetings, Events & Visitors

Delegation from BIMSTEC visited ICAR-CPRI, RS Modipuram

A delegation from BIMSTEC Group member countries (India, Myanmar, Bhutan, Bangladesh, Sri-Lanka) visited ICAR-CPRI, Regional Station, Modipuram on 13th December 2019. During the visit, the scientists shared Institute ongoing activities related to the potato breeding and seed production system in India. The delegation showed special interest in the potato varieties, storage and plant protection techniques developed by the Institute.



A glimpse of Hindi Pakhwara Celebration -2019

Hindi Pakhwara from 13-28 September 2019 was celebrated at ICAR-CPRI, Shimla. Concluding day was organized on 01, October, 2019 and Dr. SK Singh,



Director, ICAR- DKMA, New Delhi grace the occasion as chief guest and Dr. SK Chakrabarti, Director, ICAR-CPRI, Shimla presided over the programme. Dr. RK Singh, In-Charge (Official Language), ICAR-CPRI, Shimla welcomed the dignitaries and all the staff present and briefly highlighted about Hindi related work being done and the various competitions organized during the Hindi Pakhwara in the institute. Subsequently, in his presidential address, Dr. SK Chakrabarti thanked everyone for participating in the competitions organized during the fortnight and making it successful. He advocated that Hindi is the language of the common people and it was given the place of official language because it is the most widely spoken and understood language in the country. He also said that the people of the country still hesitate to adopt and use their language, because in today's era, the English language has been establishing itself as a symbol of prestige and a language of the upper class. Expressing concern over this, he said that it is not wrong to get knowledge of other languages but it is wrong to not use their own language. He called upon everyone to use Hindi language more and more in their life as well as in daily work. The chief guest Dr. SK Singh emphasized the abolition of mental slavery towards English. He said that Hindi is not only simple but also a very beautiful and comprehensible language. He called on everyone to teach their children the first Hindi alphabet in place of the English alphabet, so that they have to respect for their language and they can use it with pride even later. In addition, the winners of the 07 competitions held at the institute during the fortnight were rewarded by the chief guest and participation certificates were given to the remaining participants. Under the Hindi Incentive Scheme, the victorious employees were also awarded during this period.

Swacchta Abhiyan 2019 (Swachhta hi Seva) pakhwara celebrated at ICAR-CPRI, Shimla

As a part of the concluding of Swachhta Pakhwara celebration of the institute, a one full day cleanliness drive was organised at the institute and its regional stations on 02-10-2019. The celebration started with cleaning of the institute and its nearby areas as well as the roads connecting the institute. After that an awareness play giving message for cleanliness including Taekwondo display by the children of the staff was held at the institute auditorium. At the end the staff engaged in the day to day cleaning of the institute and others who contribute regularly in maintenance of the clean environment in the institute were honoured by the director of the institute. The function ended with a motivational speech of the director towards maintaining cleanliness in the daily routine.



ICAR-CPRI won overall trophy and Best Disciplined Team Award in ICAR Zonal Sports Meet at Kanpur

ICAR-CPRI participated in ICAR Zonal Sports meet held at ICAR-IIPR, Kanpur from 12-14 December, 2019. 43 men and women players from CPRI and its regional stations participated in this meet. ICAR-CPRI won 7 Gold Medals in Discuss, Table Tennis,



Shotput, Badminton, Volleyball Shooting events; 5 Silver medals in Carom, Shotput, Discuss, Javelin, Volleyball smashing and 2 Bronze medals in athletics events during this meet. 24 ICAR Institutes from different parts of India and about 824 players from different Institutes participated in this event. Smt. Tarvinder Kochhar and Sh. Sachin Kanwar were CDM and Manager of the CPRI Sports contingent. It was a matter of proud for whole potato family when ICAR-CPRI was adjudged **“BEST DISCIPLINED TEAM”** of the meet. Besides this, ICAR-CPRI also won **OVERALL CHAMPIONS TROPHY**. Director, ICAR-CPRI, Shimla and Heads of Stations along with all staff members welcomed the team at Shimla and regional stations.

Vigilance Awareness Week 2019 observed

Vigilance awareness week was observed at ICAR-CPRI, Shimla and its regional stations from 28th October to 02nd Nov. 2019. On the first day i.e on 28th October, 2019, all the staff of the Institute took oath of integrity and all pledged to fight against corruption. All the employees demonstrated their commitment to end the corruption which is a barrier in the progress of the country and determined to be honest and follow the rules of law in all walks of life. During the Vigilance awareness week, a workshop/Seminar on Vigilance Awareness with theme “Integrity- A way of life” was organized at ICAR-CPRI, Shimla. All the staff members of the Institute participated in the said workshop. On the occasion of workshop, Dr. SK Chakrabarti, Director, ICAR-CPRI, Shimla addressed the CPRI Staff and stressed upon being vigilant of all laws, rules and compliance mechanism in the conduct of our official work. Sh. Pankaj Kumar, CAO & Sh. Sandeep Dudi, AO conveyed that we shall promote ethical work practices and should commit to good governance based on transparency and fairness. They also detailed various aspects relating to vigilance and how to keep ourselves away from corruption while



working in any concerns. Sh. Anurag Garg, Addl. Director General, State Vigilance & Anti-Corruption Bureau was the lead speaker in this workshop/seminar. In his address, he told the staff that we should be aware of the don'ts while working in the Institute and we should neither take bribe nor offer bribe. Every citizen should be vigilant and commit to uphold high standards of honesty and integrity. Dr. NK Pandey, Institute Vigilance Officer, CPRI also emphasized upon being vigilant of all laws, rules and compliance mechanism in the conduct of our official work. Vigilance awareness week was also observed at some of the local schools and children participated in this event with high spirit. Integrity pledge was also taken by school children during this week. Integrity pledge was also taken by CPRI Business Partners. Essay Competition and Quiz Competition organized at the Institute in which staff of CPRI participated in high spirits.

Constitution-Day was celebrated at ICAR-CPRI, Shimla

To mark the 70th anniversary of the formation of Indian Constitution, Constitution Day (26th November, 2019) was celebrated at ICAR-CPRI, Shimla. On the Occasion, the preamble of the constitution was read out by the



Director followed by reading out of the fundamental duties of the Indian citizens. The handbills of the fundamental duties were also distributed among the staff and the visiting trainees of capacity building. The same exercise was carried out among the students and teachers of a Middle School and the residents of nearby area. A team of CPRI visited Shoghi, where farmers from many villages of Shoghi Panchayat (Shimla) were gathered. They were also made aware of the rights and duties of Indian citizens framed in the Indian constitution by reading out the same and also by means of distribution of handbills. During the occasion three flagship programmes of Govt. of India

viz. Doubling Farmers Income, Soil Health Card and Per Drop More Crop were also emphasised among the farming Community. The panchayat pradhan were also present on this occasion.

Diwali Mela organized at ICAR-CPRI, Shimla

ICAR-CPRI organised Diwali Mela on 19th October, 2019 for the Institute staff and their families. A number of stalls comprising decoration material by an NGO, eatables by staff members and other local vendors, games for children and others, banking sector etc. were put up in this mela. Tombola and tug of war among different divisions were the main attraction of this mela along with slow scooter race for elders, musical chair for ladies and different kind of races for children were also a part of this mela. The winners of different events were given prizes by the chief guest Mrs. Piali Chakrabarti along with lucky coupon draw at the end of the day long mela.



Human Resource

Scientific

Joining

1. Dr. Anil Sharma, Principal Scientist, ICAR-CITH, Srinagar Joined at ICAR-CPRI, Regional Station, Jalandhar on transfer w.e.f. 09.12.2019 (FN).

Promotion

1. Dr. Baswaraj Raigond, Scientist, ICAR-CPRI, Shimla placed through CAS in Level-12 (Pre-revised PB 15,600-39,100 + RGP 8,000/-) w.e.f. 04.11.2018 as Senior Scientist.
2. Sh. Virupakshagouda Patil, Scientist, ICAR-CPRI, Shimla placed through CAS in Level-12 (Pre-revised PB 15,600-39,100+RGP 8,000/-) w.e.f. 10.02.2019.

- Dr. Arvind Kumar Jaiswal, Scientist, ICAR-CPRI, Regional Station, Jalandhar placed through CAS in Level-11 (Pre-revised PB 15,600-39,100 + RGP 7,000/-) w.e.f. 01.07.2018.

Transfer

- Dr. Raghavendra KV, Scientist, ICAR-CPRI, Regional Station, Modipuram relieved on 26.11.2019 (AN) to join at ICAR-NCIPM, New Delhi.

Retirements

- Dr. (Mrs.) Kamlesh Malik, Principal Scientist, ICAR-CPRI, Regional Station, Modipuram retired from Council's service w.e.f. 31.12.2019.

Technical

Promotions

- Sh. Dharminder Kumar Gupta, Sr. Tech. Asstt, ICAR-CPRI, Shimla promoted to Technical Officer w.e.f. 06.06.2016.
- Sh. Sushil Singh, Sr. Tech. Asstt.(Driver), ICAR-CPRI, Shimla promoted to Technical Officer w.e.f. 19.06.2019
- Sh. Ravinder Kumar, Tech. Asstt, ICAR-CPRI, Shimla promoted to Sr. Tech. Asstt. w.e.f. 30.06.2019
- Sh. Pradeep Kumar Upadhyay, Tech. Asstt., ICAR-CPRI, Regional Station, Jalandhar promoted to Sr. Tech. Asstt. w.e.f. 02.08.2014 and Promoted to Tech. Officer w.e.f. 02.08.2019
- Sh. Pawan Kumar Malik, Sr. Tech. Asstt, ICAR-CPRI, Regional Station, Modipuram promoted to Tech. Officer w.e.f. 24.12.2016
- Smt. Asha Thakur, Sr. Tech. Asstt. ICAR-CPRI, Shimla promoted to Tech. Officer w.e.f. 04.06.2016
- Smt. Jitender Kaur Arora, Tech. Asstt., ICAR-CPRI, Shimla promoted to Sr. Tech. Asstt. w.e.f. 10.08.2015
- Sh. Deep Ram, Tech. Asstt, ICAR-CPRI, Shimla promoted to Sr. Tech. Asstt w.e.f. 23.07.2019
- Sh. Rakesh Kumar, Tech. Asstt, ICAR-CPRI, Shimla promoted to Sr. Tech. Asstt. w.e.f. 10.06.2019
- Sh. Ajit Singh, Tech. Asstt., ICAR-CPRI, Regional Station, Kufri promoted to Sr. Tech. Asstt. w.e.f. 26.07.2019
- Sh. Alekh Narain, Sr. Tech. Asstt., ICAR-CPRI, Regional Station, Patna promoted to Tech. Officer w.e.f. 11.06.2019

- Sh. Anil Kumar, Sr. Tech. Asstt., ICAR-CPRI, Regional Station, Patna promoted to Tech. Officer w.e.f. 09.08.2015

Retirements

- Sh. Kamal Singh, Sr. Technician(T-2), ICAR-CPRI, Regional Station, Modipuram retired on 31.12.2019
- Sh. Ram Kumar Verma, CTO, ICAR-CPRI, Regional Station, Modipuram retired on 31.12.2019.

Resignation

- Sh. Sanjay Kumar, Tech. Asstt (T-3), ICAR-CPRI, Shimla resignation on 11.12.2019

Administrative

Probations clearance

- Sh. Deep Ram, Assistant, ICAR-CPRI, Shimla cleared his probation w.e.f. 16.01.2019 and confirmed from 17.1.2019.
- Sh. Sanjib Kumar, Assistant, ICAR-CPRI, Shimla cleared his probation w.e.f. 26.01.2019 and confirmed from 27.01.2019
- Sh. Rakesh, Assistant, ICAR-CPRI, Regional Station, Jalandhar cleared his probation w.e.f. 10.09.2019 and confirmed from 11.09.2019

Inter-Institutional Transfer

- Sh. Sandeep Verma, Assistant, ICAR-CPRI, Shimla relived on 25.11.2019 (AN) to join at ICAR-VPKAS, Almora (Uttarakhand).

Skilled Supporting Staff

MACP Granted

- Sh. Ramesh Kumar, SSS, ICAR-CPRI, Shimla, granted 3rd MACP w.e.f. 02.11.2019.
- Sh. Hira Singh, SSS, ICAR-CPRI, Regional Station, Kufri, granted 3rd MACP w.e.f. 02.11.2019.
- Sh. Saran, SSS, ICAR-CPRI, Regional Station, Kufri, granted 3rd MACP w.e.f. 02.11.2019.
- Sh. Komal, SSS, ICAR-CPRI, Regional Station, Jalandhar, granted 3rd MACP w.e.f. 08.02.2020
- Sh. Roshan Lal, SSS, ICAR-CPRI, Shimla, granted 2nd MACP w.e.f. 23.04.2019.

Probation clearance

- Smt. Kiran, SSS, ICAR-CPRI, Shimla, w.e.f. 17.08.2019 and confirmed from 18.08.2019

Retirement

- Smt. N. Anagamma, SSS, ICAR-CPRI, Regional Station, Ooty retired on 31.10.2019.

From the Director's Desk

Potato production in India has shown a steady increase in the past, presently making the country second largest potato producer in the world. As per the latest available data, during 2018-19, approximately 52.5 million metric tons of potatoes have been produced (NHB, 2019). Increase in production, often resulting in gluts at harvest, result in several post-harvest problems like storage and proper utilization of the produce. About 90% of the potato crop in the country is harvested during January-February in the Indo-Gangetic plains comprising the states of Punjab, Haryana, UP, Bihar, West Bengal, MP and Gujarat where the harvest is followed by rising temperatures of hot and dry summer, and further by warm and humid rainy season. Since potato tubers contain about 80% water, under such circumstances, a semi-perishable commodity like potato, cannot be stored beyond 3-4 months without refrigeration because of very high losses due to shrinkage, sprouting and attack by microorganisms. Hence, potatoes are mostly stored in refrigerated cold stores maintained between 2-4°C and 90-95% relative humidity (RH). Low temperature storage has advantages of natural control of sprout growth, low evaporative losses and minimum risk of diseases and pests. These conditions are ideal for storage of seed potato but these cause cold-induced sweetening leading to excessive accumulation of sugars in most of the potato cultivars making them unfit for processing due to browning in chips. Also, such tubers are less preferred for consumption because of sweet taste. The potatoes meant for processing are therefore, either stored under non-refrigerated conditions for short term or stored at 10-12°C with the use of some sprout suppressant like CIPC (isopropyl N-(3-chlorophenyl) carbamate) to minimize the accumulation of reducing sugars. The chips produced from such tubers are light in colour and the processing industry is getting round the year supply from such storages only. Besides, potatoes stored at elevated temperatures are also marketed as low sugar potatoes and these fetch better prices in the market. Presently, there are about 7600 cold storages in the country having a capacity of about 37 million metric tons, out of which about 68% capacity is utilized for storing potatoes only. The projected growth in cold storage industry is expected to be at 13-15% ACGR and more than 16000 crores is targeted to be invested in infrastructural developments related to cold storage. Amongst the new and existing storages, around 1000 cold storages have already been modified for storing potatoes at elevated temperatures using sprout suppressant. Potato processing on the other hand is essential to sustain the increasing potato production in the country and to provide proper remuneration to the cultivators. Potatoes can be processed into a variety of products. Potato chips, French fries and dehydrated chips are the most popular processed potato products in the organized and unorganized sectors. In India, potatoes have been utilized largely for consumption as fresh potatoes and the major part of potato harvest (approx. 68.5%) goes to domestic table consumption. Whereas, in the developed countries, table potato utilization is merely 31%, rest being frozen French fries (30%), chips and shoestrings (12%) and dehydrated products (12%).



The processing of potatoes in the country was not in vogue till 90's and with the openings of organized processing by multi-nationals and indigenous players, potato processing industry has grown manifold. The organised processing was merely 0.12 million tons in 2003, which has risen to a level of about 1.8 million tons by now. Whereas, the unorganised processing is still continuing at cottage level, but sharing large capacities. The pattern of Indian potato industry suggests that the demand for potatoes for processing purpose is expected to rise rapidly over next 30 years for French fries (11.6% ACGR) followed by potato flakes/ powder (7.6%) and potato chips (4.5%). The demand for processing quality potato is expected to rise to 25 million t during the year 2050. However, to sustain this expected growth in processing sector, major infrastructural investments are required along with release and adoption of potato varieties having good processing quality at harvest as well as during long term storage. The diversification in terms of products development as per the consumers preference in the country is also equally important and industrial production of potato flour and starch for making these kinds of products are necessary.

Compiled and edited by: Brajesh Singh, Ravinder Kumar, Pooja Mankar & Kumar Nishant Chourasia

Published by: Director, ICAR-Central Potato Research Institute, Shimla-171 001, H.P. (India)

Secretarial Assistance: Sachin Kanwar, Nisha Verma & Suresh Kumar

Phone: 0177-2625073, Fax: 0177-2624460, E-mail: director.cpri@icar.gov.in, website: <https://cpri.icar.gov.in>

Printed at: National Printers, B-56, Naraina Industrial Area, Phase II, New Delhi - 110 028, **Phones:** 011-42138030, 09811220790