



Central Potato Research Institute Newsletter

Number 50

October-December, 2012

Dr. N.K. Krishna Kumar : Our New DDG (Hort.)



CPRI Director and staff congratulate Dr. N.K. Krishna Kumar as our new Deputy Director General (Hort.) ICAR, New Delhi. He has done M.Sc (Ag.), Ph.D (USA) and Post- Doctoral (USA) and is a renowned entomologist in the country. He has 34 years research experience and has over 120 research publications in national and international journals. Also a recipient of many national and international awards too like East-West Centre Award, Award of merit, Gama Sigma Delhi, Pacific branch and ICAR fellowship. Before assuming the charge of DDG, he was Director of NBAII, Bangalore. CPRI firmly believes that Horticulture Division of ICAR will come out with flying colours under his able leadership in all aspects.

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Research Highlights

A new nutrient use efficient potato variety Kufri Gaurav released for Indian plains

Kufri Gaurav is a high yielding medium maturing white tuber variety having moderate resistance to late blight, is suitable for cultivation in northern plains of the country. It was released vide Notification Number: 2363(E) dated 4th October 2012 by the Central Sub-Committee for Crop Standards, Notification and Release of Varieties, Ministry of Agriculture, Government of India, for its general cultivation in northern Indo-gangetic plains. At most of the places, Kufri Gaurav gave yield higher than the medium maturing cultivars both under early-medium (75 days) and medium (90 days) harvests. Specific areas for its adaptation are Haryana, Punjab, Uttaranchal and western Uttar Pradesh. In multi-location replicated trials from 1999-2003, Kufri Gaurav gave better yield than controls at 75 days and over different locations in northern plains there was 7.3 to 14.5% increase in total yield and 7.5 to 14.8% increase in marketable yield over best control Kufri Ashoka. Kufri Gaurav performed better than control at 90 days harvest and there was 5.1 to 15.9% increase in total yield and 2.3 to

15.2% increase in marketable yield over best control Kufri Pukhraj. In recent (2010-2011) multilocation replicated trials in Northern plains Kufri Gaurav gave 8.1% and 13.0% higher marketable yield than control for yield at 75 days and 90 days harvests, respectively. Most striking feature of this variety is that it is nutrient use efficient. Kufri Gaurav showed about 9.7-21.2% greater agronomic use efficiency of N than best control Kufri Pukhraj/Kufri Pushkar during different years in northern plains. Kufri Gaurav also showed 11.7-19.2% greater agronomic use efficiency of P and 15.8-19.9% greater agronomic use efficiency of K than best control Kufri Pukhraj/Kufri Pushkar during different years. Kufri Gaurav performs better under nutrient (N, P and K) stress conditions than other control varieties like Kufri Jyoti, Kufri Pukhraj and Kufri Pushkar. Moreover, it also responds to high doses of N, P and K. Kufri Gaurav has very attractive white skinned oval shape tubers. The tuber flesh is creamy in colour. It has good cooking quality and the texture of tuber on cooking is waxy. This variety is likely to be a good replacement for medium maturing varieties like Kufri Pukhraj and Kufri Pushkar. This variety will be useful for resource poor farmers as this variety produce yield similar to other released varieties at lower doses of N, P and K.

-Raj Kumar, G.S. Kang and S.P.Trehan

Zinc deficiency in potato tubers

A nutrient balanced diet is the aim of any sustainable food security program. Studies have revealed that micronutrient deficiency led disorders occur in over half of the total human population globally, including India. As per available literature, an adult human body has about 2-3 g of zinc, about 0.1% of which is replenished daily. The recent studies in molecular physiology, strongly suggest that some, if not all of the iron deficiencies in humans, may be associated with zinc deficiency. Among the vegetables, potatoes have been an important constituent of Indian food for centuries and are an integral part of the diet, both for rich and poor population. Therefore to address the zinc deficiency, zinc content of tubers from different treatments of a long term study, initiated in 2006 at Modipuram was estimated during 2010-11 containing different treatments in three cropping systems viz., Potato-wheat-paddy; Potato-onion-maize and Potato-moong-sesamun. The results revealed that irrespective of applied nutrient supply options (inorganic, organic, integrated) and additional application of zinc @ 25 kg ZnSO₄/ha to potato, like absolute control,



Tubers of variety Kufri Gaurav

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zinc content in tubers is found in traces. In absolute control, right from the start of the experiment in 2006, no nutrient, including zinc had been applied to any crop of all the three potato based cropping systems. It thus implies that translocation of zinc to tubers is not taking place, even when zinc was applied additionally to potato crop. To ascertain the results, tubers starch samples of forty three varieties grown at Modipuram and tubers of eighteen varieties grown at Jalandhar station were analyzed, but the results were similar. Thereafter, tubers grown under different agro-climatic regions (15 AICRP centers) were also analyzed and zinc was found in tubers grown at Bhubaneswar, Pune, Pasighat, Raipur and Chindwara centers only. Most of these centers are of course non-traditional potato growing regions and represent only a small fraction of total acreage under potato in the country. But presence of zinc in their tubers confirms that it is possible to produce Zn-rich tubers. As concentration of mineral elements in potato tubers are influenced by both environmental and genetic factors, it calls for further studies to know the reasons, restricting zinc translocation to tubers in major potato growing areas in the country and using advance molecular-genetics tools for increasing its nutritive value.

N.C. Upadhayay, B.P. Singh, S.K. Kaushik, M.A. Khan, R. Ezekiel, Name Singh and Mahesh Kumar

Evaluation of potato varieties at Thalavadi, Erode (Dist.), Tamil Nadu

Four potato varieties viz., Kufri Badshah, Kufri Surya, Kufri Jyoti and Kufri Pukhraj were evaluated at two localities at Germallam and Kanakarai villages of Thalavadi taluk (approx. 1050 m MSL) of Erode district in Tamil Nadu. The seeds were supplied from CPRS, Jalandhar and planted in row trials with 50 tubers per row. The trials were planted on 16.08.2012 and fertilizers were applied as per the dosage recommended for Ooty. The results revealed that Kufri Surya recorded the maximum yield (11.5 t/ha) followed by Kufri Badshah (9.3 t/ha), K. Jyoti (3.8 t/ha) and K. Pukhraj (0.3 t/ha).

Varieties	Tuber weight (kg)**			
	<20 g	20-80g	>80 g	Total
Kufri Badshah	1.3 (2.2)	3.7 (6.2)	0.6 (1.0)	5.6 (9.3)
Kufri Surya	0.8 (1.3)	4.1 (6.8)	2 (3.3)	6.9 (11.5)
Kufri Jyoti	0.5 (0.8)	1 (1.7)	0.8 (1.3)	2.3 (3.8)
Kufri Pukhraj	0.1 (0.2)	0.1 (0.2)	0 (0.0)	0.2 (0.3)

**figures in parentheses indicate tuber weight in t /ha

However, performance of Kufri Badshah was good throughout the growth stage and there was no rotting of tubers at harvest.

G. Ravichandran, R. Umamaheswari, K. Manorama, R. Muthuraj, T. A. Joseph and B.P. Singh.

Training & Technology Transfer

Farmers Training at Shimla

A training programme was organized at CPRI Shimla on “**Modern Techniques for Quality Seed and Table Potato Production**” during Oct. 10-11, 2012. Altogether 20 farmers from Bilaspur district of HP were trained on “**Improved varieties, planting operations, disease and pest management, integrated nutrient management, processing and storage of potato crop**” by scientists of CPRI. An exposure visit to potato seed farms at CPRS Kufri-Fagu was also organized to create awareness and give first hand information to these potato growers on seed potato production technology.

Model Training Course for Agri/Hort. officers at CPRI, Shimla



Model Training Course at CPRI Shimla

An eight day Model Training course on “**Technology for quality seed potato production and certification**” was organized at CPRI, Shimla for Agri./Hort. Officers of different states of India viz. Punjab, HP, UP, Karnataka, Assam, Manipur and Tripura from Nov. 30 to Dec. 7, 2012. A total of 13 agri./hort. Officers were trained on various techniques of production and certification of potato seed. A variety of training methods were used to provide rich learning experience to the trainees. These included lecture-cum-discussion, practical sessions, skill demonstration, field visits and video film shows.

Awareness camp in Lahaul - Spiti under TSP



Awareness camp cum training on potato

CPRI organized an awareness camp cum training programme on “**Modern Techniques for Quality Seed and Table Potato Production**” on 31st Oct. 2012 at Udaipur, Lahaul Spiti districts of HP under TPS (Tirbal sub plan). More than 150 male and female potato growers of the area participated in this programme. Experts from CPRI delivered lectures on various topics such as planting operations, fertilizer management, plant protection and post harvest management of potato crop. Free extension bulletins were supplied to visitors of this programme. The future plans for trainings and demonstrations were chalked out for the area under TSP.

Farmers training programmes under Mini Mission-I

CPRI, Shimla organized one On-campus and one On-farm training of potato growers under the project “**Training entrepreneurial skills to farmers in potato based farming system of Himachal Pradesh**” in Mini Mission-I from October to December, 2012. Altogether 61 potato growers from Shimla, Solan, Mandi districts were trained in improved techniques of cultivation of potato and other vegetables in HP. These trainings were conducted in collaboration with NGO of concerned districts.

Farmer's training at Jalandhar

Farmer's training programme on “**Potato Seed Production**” was organized at Central Potato Research Station Jalandhar on December

11, 2012. More than 350 farmers attended the training programme. Chief guest Shri Gurpartap Singh Wadala, MLA in his inaugural address appreciated the research work being done at the Institute.



Farmer's training at Jalandhar

Farmers were trained on breeder seed production, fertilizer management in potato, management of major diseases and pests in potato, improved varieties of potatoes and on rouging techniques for improving seed quality etc. Farmers were also taken for a field visit at the station's farms. A training manual in punjabi on "Aloo beej utpadan diyan techniqaan" was also released on this occasion. An exhibition, including tractors and farm implements pesticides and fertilizers etc were also put up on this occasion for the benefit of the farmers. The Institute stall displayed the latest research innovations in the field of potato mechanisation, varieties, diseases and their control, books and technical bulletin etc.

Training of Horticulture Officers at Ooty

One day training programme was organized on 12.10.2012 at CPRS, Ooty and 25 Horticulture Officers and 10 Agriculture Officers (Agri, Marketing Division) from Department of Horticulture, Udhagamandalam were trained on 'Technologies for potato cultivation'.



Training programme at CPRS, Ooty

Shri. Srinivasa Reddy, IFS, Project Director (HADP), Nilgiris was the Chief-Guest and Shri. G. Mohan, Joint Director (Horticulture), Udhagamandalam and Dr. Jagdish Kumar, Head, IARI Regional Station, Wellington gave special address to the trainees. Scientists of CPRS, Ooty gave lectures on recent potato varieties, latest technologies in potato production, disease and pest management in potato and seed potato production. Practical demonstrations were conducted in the field and the trainees were exposed to the tractor-mounted semi-automatic potato planter and harvester.

Important Meetings & Visitors

Parliamentary committee on Official language Implementation visits CPRS, Ooty

Review meeting of the second sub-committee of Committee of Parliament on Official Language Implementation was held on 06.10.2012 at Ooty. Dr.T.A. Joseph, Head welcomed the Hon'ble Members of Parliament and highlighted the various activities of the Station, current status of Official Language implementation at the Station and the future strategies to be undertaken to implement the official language in day to day functioning of the station. Dr. S.K.Malhotra, Principal Scientist, Horticulture Division, ICAR, New Delhi; Shri. Rajiv Uniyal, Deputy Director (Official language), ICAR,

New Delhi; Shri Praveen Chandla, Assistant Director (Official Language), CPRI, Shimla; along with the station scientist participated in this review meeting.



Review Meeting by the Parliamentary Committee

Stakeholders meet held at CPRS Jalandhar

A meeting of the stakeholders on potato research and development was held at Central Potato Research Station Jalandhar on December 10, 2012 under the chairmanship of Dr Bir Pal Singh, Director, Central Potato Research Institute, Shimla. Forty nine persons including representatives from private companies like Syngenta India Limited,



Stakeholders meet at Jalandhar

Pune, Technico, Chandigarh, Haldiram Snacks Pvt. Ltd, Noida, Satnam Agriculture Products, Jalandhar, Transgenic Bioplants Private Limited, Ropar, Cold store owners, Agricultural implement manufactures, Area Manager, National Seed Corporation (NSC) Jalandhar, executives of Jalandhar Potato Growers Association, executives of POSCON Jalandhar, scientists of CPRS Jalandhar, scientists from CRRIC Modipuram and many other progressive farmers attended this meet. There were discussions on improvement of machine like haulm cutter, combine harvester, popularization of new potato varieties, involving progressive farmers in potato breeding, way to enhance potato consumption and involving farmers in certified seed production. To suggest ways and means to popularize newly released varieties a committee of 14 persons from companies/ progressive farmers and CPRI was constituted.

Official Language function

Official language function was organized at CPRI Head quarters and different competitions alongwith the workshop on official language. Officials from all the categories participated in this programme. Official language function and prize distribution function was held on 28th December, 2012 and prizes were given for essay writing, word knowledge, memory test, quiz competition and hindi typing. While addressing the officials of CPRI, the Director Dr. Bir Pal Singh emphasized on using hindi in official correspondence. Prior to this Assistant Director (OL) Sh. Praveen Chandla briefed the staff about the guidelines of official language policy and requested to implement them with conviction

Live Phone-in Programme at Doordarshan

Expert scientists of CPRI, Shimla participated in the Live-phone in programmes of Shimla Doordarshan from October to December, 2012. The details of the topics along with experts are given below.

Month	Title/Topics	Name of the Expert
October	Post harvest operation and marketing of potato	Dr. NK Pandey, Dr. RK Rana
November	Planting and fertilizer application in lower hills of HP	Dr. VK Dua, Dr. MK Jatav
December	Potato cultivation in HP & Disease management of potato in HP	Dr. NK Pandey; Drs. Ravinder Kumar and VK Chandla

Human Resource

Promotion

Name	To	Date
Scientific		
Dr. SK Kaushik, Sr. Sci., Dr. Raj Kumar, Sr. Sci., Dr. SK Luthra, Sr. Sci., Dr. Anuj Bhatnagar, Sr. Sci., Dr. V.K. Dua, Sr. Sci., & Dr. RK Rana, Sr. Sci.	Principal Scientist	01.01.2009
Dr. Manoj Kumar, Sr. Sci.	Principal Scientist	17.03.2009
Dr. Brajesh, Singh, Sr. Scientist	Principal Scientist	20.02.2010
Dr. Vinay Singh, Sr. Sci.	Principal Scientist	11.05.2010
Dr. Dhruv Kumar, Sr. Sci.	Principal Scientist	20.05.2011
Dr. Sanjay Rawal, Sr. Sci.	Principal Scientist	12.09.2011
Dr. Sidharth Kumar Singh, Sr. Sci.	Principal Scientist	24.12.2011
Technical		
Promotion under 33.33% Departmental Promotion Quota from Skilled Support Staff on different dates. These include Sh. Bijinder Singh, Sh. Pawan Kumar, Sh. Tara Chand, Sh. Sita Ram, Sh. Sat Pal Singh, Sh. Pravesh Kumar, Sh. Laiq Ram and Sh. Surinder Pal.		
Administrative		
Financial upgradation granted to 5 administrative staff under MACP scheme on different dates. These include Smt. Bindra Gupta, Asstt., Smt. M. Rani, UDC, Smt. Urmila Verma, UDC, Smt. Sunita Thakur, UDC and Sh. Om Prakash, UDC		
Supporting Staff		
Financial upgradation granted to 9 supporting staff under MACP scheme on different dates. These are Sh. Shatrughan Prasad, Smt. Sonu Devi, Sh. Kulwant Singh, Ms. Niranjan Kaur, Smt. Kamla Devi, Sh. Ram Sarup, Sh. Joginder Pal, Sh. Anant Ram and Sh. Nand Lal.		

Transfers

Name	From	To
Scientific		
Dr. EP Venkatasalam, Scientist	CPRI, Shimla	IARI, Wellington Centre, Ooty, Tamil Nadu.
Dr. R. Muthu Raj, Sr. Scientist.	CPRS, Ooty	CPRI, Shimla
Technical		
Sh. Udaivir Singh, (T-4)	CPRS, Jalandhar	CPRIC Moduram
Sh. Anil Kumar Chandel (T-2)	CPRS, Patna	CPRS, Jalandhar

Administrative

Sh. Girish Thakur, Steno. GR.III CPRS, Gwalior CPRI, Shimla

Retirements

Name	Post	Retired on
Scientific		
Sh. Rambir Singh,	Principal Scientist, CPRIC, Moduram	31.10.2012
Dr. TA Joseph	Principal Scientist, CPRS, Ooty.	31.12.2012
Technical		
Sh. Atma Ram	T-2, CPRS, Kufri	31.10.2012
Sh. Ram Nath Vishwakarma	T-3 (Tractor Driver), CPRS, Patna	31.10.2012
Administrative		
Smt. Nirmal Rani	UDC, CPRS, Jalandhar	31.10.2012

Foreign Visits

Dr. Shashi Rawat, Sr. Scientist, CPRI, Shimla participated in the training programme on "DNA Sequencing" at Asia Pacific Support Centre, Shanghai, China during November 01-08, 2012.



Dr. (Ms.) Jeevalatha, Scientist, CPRI, Shimla participated in the training programme on "Micro-Array System" at Asia Pacific Support Centre, Shanghai, China during November 01-08, 2012.



Dr. Bir Pal, Singh, Director, CPRI, Shimla participated in the meeting of Board of Trustees of CIP held at CIP, Lima, Peru during November 19-23, 2012.



Dr. Bir Pal, Singh, Director, CPRI, Shimla participated in the Workshop on "Biotechnology for Food Security and Farmer Prosperity and ABSP-II Potato Partners Meeting" held at Dhaka, Bangladesh during 28-29 November, 2012. This meeting was also attended by Dr. Sanjeev Sharma, Sr. Scientist, and Dr. S. Surendresha Scientist, CPRI, Shimla.



From the Director's Desk

Potato is the fourth most important crop worldwide after maize, wheat and rice and is a rich source of proteins, carbohydrates, vitamins and minerals. Potato protein is composed of all the essential amino acids necessary in the human diet. In addition, a small potato delivers more than 10% Daily Value of folate, manganese, magnesium and phosphorus and more than 20% Daily Value of potassium, vitamin C and vitamin B-6. Potatoes have higher phyto-nutrient content but contain lesser content of zinc and iron. Potatoes are grown throughout the country and are consumed in large quantities. One of the global health goals is to increase the availability of nutrients to a large population of the world. A sensible approach to achieve this goal would be to increase the nutritional content of highly consumed crops and the future food crop "potato". In this direction a flagship programme on "Development of nutrient rich (Zn and Iron) potatoes" has been proposed to be taken up during the twelfth plan.

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Published by: Director, Central Potato Research Institute, Shimla 171 001, HP, India

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Printed at : Azad Offset Printers (P) Ltd., 144, Press Site, Indl. Area-1, Chandigarh, Ph. : 0172-2656144, 2657144, 4611489