Both food, and therefore, nutrients needs of India are expected to go up consistently in the future without a break. The net cropped area has more or less stabilized at 142 Mha. The population of 1 billion plus is expected to grow by 14-15 million each year. At present, each hectare of net sown area has to support more than 7 persons. The experts on horticulture, vegetable, plantation crops, sugarcane, cotton, oilseeds and potato have projected that by the year 2025, the demand for fertilizers for these high value crops, which also have high export potential and claim fertilizer use on priority basis, will rise to 3.0, 2.0, 3.2, 0.9, 3.1, 1.5 and 1.0 Mt, respectively.

Without doubt India is proud of its 'green' revolution, since it enabled a nearly fourfold increase in food production in the last 50 years. But this achievement has been followed by a loud protest concerning the degrading environmental effects of higher agricultural inputs that ushered in the green revolution. Further improvements, including balanced fertilization through efficient nutrient management, will help diminish environmental concerns while sustaining a strong food production capacity.

Adequate crop nutrition is a key component of improved production technology. The gap between nutrients required by the crops and to be made available from soil nutrient supplies has to be bridged through external nutrient application. This can be done through a number of organic, microbial and mineral sources, often in an integrated manner. Fertilizers are by far the most important source of plant nutrients and have made a place for themselves in intensive cropping by helping obtain and sustain high crop yields. Balanced and efficient use of fertilizers, organics and biofertilizers is the key step which results in lower unit crop production costs, higher economic returns and minimal negative environmental impact. The four watchwords around which the plant nutrition needs and strategies should be built are optimum, balance, efficiency and effectiveness. This is possible by putting proven scientific findings into practices on individual farm holdings and revitalizing support services such as soil and plant testing, fertility monitoring, matching product supply with soil nutrient deficiencies and taking care of all production inputs. The article on nutrient management in this newsletter provides the basis/information for efficient nutrient management for optimum potato production.
Research Highlights

CPRI develops a new cyst nematode and late blight resistant hybrid OS/93-D-204 (K. Neelima) for Nilgiri hills

Potato is cultivated in about 4500 ha in Nilgiri hills of Tamil Nadu, where three crops can be grown round the year. The major limiting factor in potato cultivation in this region is the potato cyst nematodes and late blight disease. Although varieties like Kufri Swarna, Kufri Gitraj, Kufri Jyoti are popular in this region, Kufri Swarna released in 1985 is the only cyst nematode resistant variety available to farmers for cultivation. To overcome this malady, systematic breeding work continued at CPRS Ootacamund to develop high yielding cyst nematode and late blight resistant cultivars. This led to the development of a cyst nematode and late blight resistant hybrid OS/93-D-204. In initial multilocation trials, on average the hybrid yielded higher than the best control at five locations viz., Nanjanad (14.5%), Fernhill (50.3%), Yellanahalli (50.2%); Theerikkal (32.1%); Gandhipet (0.9%) out of 6 locations tested in farmer's field in Nilgiris. In on-farm trials, the hybrid yielded higher than the best control in 7 locations namely Kookalthorai (9.06%); Glen Morgan (8.46%); Aduthorai (14.79%); Fernhill (8.81%); Wellington (26.59%); Nanjanad (21.91%); Aadowalol (48.59%) out of 10 locations tested in farmer's field. The hybrid has been recommended for release by 27th Group Meeting of Potato Workers of All India Coordinated Research Project (Potato) held at University of Agricultural Sciences, Dharwad (Karnataka) on 10-12 August, 2009. It is a medium maturing cyst nematode and late blight resistant hybrid suitable for cultivation in Nilgiri hills of Tamil Nadu where potato cyst nematodes (Globodera pallida and Globodera rostochiensis) and late blight disease are major plant protection problems in potato cultivation.

Potato genome sequence released by International group of Scientists

The Potato Genome Sequencing Consortium (PGSC), an international team of scientists including Central Potato Research Institute (Indian Council of Agricultural Research), Shimla, Himachal Pradesh, India, has announced the release of the first draft sequence of the potato genome. The PGSC started work on the project three years ago. The resulting ‘blueprint’ of how the potato works could revolutionize breeding programs.

Potato, a key member of the Solanaceae family, is a close relative of tomato, pepper, and eggplant. It is the world’s third most important crop and the most important vegetable crop. Access to the potato genome sequence, the “genetic blueprint” of how a potato plant grows and reproduces, is anticipated to assist potato scientists in improving yield, quality, nutritional value and disease resistance of potato varieties. More importantly, the potato genome sequence will permit potato breeders to reduce the 10-12 years currently needed to breed new varieties.

The PGSC was initiated in January 2006 by the Vegetable Breeding Department of Wageningen University & Research in the Netherlands and has developed into a global consortium of research groups from 14 countries. India is an active partner in this global effort and is contributing both in sequencing and bioinformatic analysis of the genome. This effort is being financed in India exclusively by the Indian Council of Agricultural Research (ICAR), New Delhi and is being carried out at Central Potato Research Institute, Shimla which has pioneered the technology of potato production under sub-tropical weather condition. A high throughput genome sequencing laboratory has been created at Central Potato Research Institute, Shimla for this purpose. The laboratory would facilitate application of modern genome-based research tools for development of high yielding and heat-tolerant potato varieties with built-in resistance to diseases and pests.

The potato genome has 12 chromosomes and is estimated to be 840 million base pairs. At the onset of the project, the PGSC employed an approach in which the work was allocated to each consortium member based on chromosomes and was focused on the diploid line RH189-039-16 (RH) of cultivated potato, Solanum tuberosum. However, in the past two years, the advent of new sequencing technologies led to a significant change of approach within the PGSC.
and in 2008, the consortium initiated sequencing of the doubled monoploid S. phureja (DM1-3 516R.44) potato derived from a diploid landrace of potato in order to simplify and complement the RH effort. In June 2009, PGSC members came together in Carlow, Ireland to plan the final phases of the project.

Currently, the PGSC is busy with finalising the sequence data for both RH and DM with an end goal of a high quality draft sequence of both of these potato lines by the end of 2009. Currently, genome coverage is greater than 70X using a combination of data generated by using three different sequencing platforms including two of the Next Generation Sequencing Platforms. The assembly, which covers 95% of the genes in potato, was possible due to a newly developed computer program by the Beijing Genomics Institute, a member of the PGSC from China.

This first draft genome assembly is now available in the public domain at www.potatogenome.net and updates will be made over the next 6 months as additional data is generated including annotation of the genes, analysis of when and where they are switched on and off, and analysis of specific suites of genes that are critical to potato production.

Mega rain-water harvesting at Central Potato Research Station - Kufri (Fagu unit) farm

Situated at an elevation of about 9000 feet above m.s.l., the Fagu farm unit under the aegis of Central Potato Research Station- Kufri (Shimla) is catering to the production of Nucleus seed potatoes. The prevailing low temperature and high wind velocity during the crop season coupled with heavy snow fall during winters does not allow the build up of aphids (virus vectors) thus making the place highly suitable for the production of basic stages of breeder's seed. The farm unit comprises of about 11.0 ha land on a singly sun-facing slope on the north-south aspect and is also free from major soil borne pathogens. Taking advantage of such favourable conditions, the farm unit is being used successfully for the production of nucleus seed potatoes for the last more than 40 years. Recently production of seed potatoes through micro-propagation involving development of mini-tubers under the protected structures has also been started as a replacement of old system of clonal selection and multiplication in a phased manner.

Field crop of seed potatoes is grown here during April-August under rain-fed conditions, whereas, the production of mini-tubers from micro-plants and micro-tubers is done twice in a year viz., March-July and August/Sep.-December/January under the poly-house conditions. Immediately after planting, the field crop faces hot and dry period of May-June during which the crop mostly suffers due to drought adversely affecting the seed yields, while simultaneously prolonging the crop period. Besides, there is always a high demand of water for the irrigation of crop inside the poly-houses during both the seasons and frequently the water requirement was being met by buying the water from outside.

Having no other source of water at Fagu farm, harvesting of rain-water was the only option to circumvent the problem of water scarcity. Hence, a new water harvesting tank has been constructed during the present rainy season at this farm, in an oval shape with the dimensions of 51.5m (length), 30.0m width, and a depth of about 3.0m. The total water storage capacity of the tank is about 4.0 lakh liters. The catchment area for water harvesting is about 2.0 ha. To prevent any loss of water due to seepage, the inner surface of the pond has been lined with a pond liner sheet called EPDM.

The water harvested from this tank will be used gravitationally for the irrigation of the precious crop (raised from tissue-culturally developed planting material) inside the poly-houses during both the seasons, besides providing life saving field irrigations at least to the basic stages of nucleus seed potatoes raised from either of the systems _x2C_ mini-tubers and/or clonal multiplications. The structure will definitely prove fruitful in covering the risk related to the crop failure due to severe droughts and thus in maintaining the continuity of seed cycle involving different stages of
Multiplications. This will also save a lot of money spent on buying the water for irrigation in poly-houses. Being located in the centre of the farm along the central farm road, the water harvesting tank is also improving the outlook of the surrounding area, besides serving the water needs.

**Identifying suitable areas for growing kharif potato through GIS**

Kharif potato constitutes an important constituent in the potato scenario of the country. Not only that it occupies large area in the central and southern parts of India where it adds economic sustainability to the cropping systems of the area, but its role as the source of fresh potato during the lean period adds to its importance. CPRI has been making efforts not only to find ways and means to increase the area under kharif potato but also to improve the productivity and efficiency of production.

Characterizing the production environments is an important step for developing Best Management Practices. Hitherto, the kharif potato area had not been clearly demarcated which was reducing the pace of research and development. However, with the improvements in computing facilities due to the easy availability of sophisticated hardware and software and also databases this work has now become easier. Therefore, studies were taken up at CPRI to identify the plateau areas in the Central and Southern parts of the country and then delineate areas suitable for growing potato during the kharif season. Since plateau areas are defined as flat topped lands between 300 to 1300m altitudes, place between these altitudes were delineated from worldclim database of 2.5 minutes resolution. However, not all these areas are suitable for growing potato in the kharif season since potato is sensitive to high temperature. Therefore, the thermal regime of the kharif season of important kharif potato growing locations were analysed and it was found that in areas above 600m altitude, the thermal regime during the kharif season was congenial for raising a potato crop. Hence, in the second step such areas lying between 600m and 1300m altitude in the plateau areas was delineated and it is expected that in these areas potato could be grown during the kharif season and best management practices for each of these places needs to be worked out.

*PM Govinda Krishnan & Group*

**Potato seed production under NAIP at CPRS Patna**

A total of 38 farmers (13 under potato seed production and 25 under processing/ware production) of Chakramdas, Vaishali, Bihar were adopted under the project **“Training under sustaining livelihood improvement through need based integrated farming system models in disadvantaged district of Bihar (under NAIP Component-3)”**. Adopted farmers were imparted training both on campus and off-campus related to scientific know-how of potato seed production, late blight management, rouing seed treatment, grading, storage & processing. In the variable plot size, thirty eight farmers grew the seed and processing/ware crop covering an area of 4.0 ha (two ha, each for seed & processing/ware crop). The agronomic practices were supervised at farmer’s fields by scientists and technical staff at very regular intervals. The seed crop was got certified by state seed certification agency. Package of practices for seed and processing potato production were applied by the participation of farmers.

A total of 337.4q of seed was produced. Farmers kept the seed for planting in the next season as per their requirement and sold the remaining produce @ 1000-1800/ kg. Similarly, under processing/ware crop 177.4q and 97.0q yield was obtained from variety Kufri Chipsona-1 and Kufri Kanchan, respectively. Twenty to thirty per cent increase in income and 200 per cent employment was generated by the implementation of potato technologies in the village. Two self help groups one each of seed producers and processing farmers were also formed under the project.
Training programme at Jalandhar

A three day training programme on potato production, storage and utilization for horticultural officers was organized at CPRS, Jalandhar from 1st to 3rd December, 2009. Nineteen (19) participants from Punjab and J & K Departments of Horticulture, Punjab State Seed Certification Authority, Punjab Mandi Board and Central Integrated Pest Management Centre, attended this training programme. The training programme included lectures on different topics by the Scientists of this station, practicals and field visits. Er. Manjit Singh, Head of the Station, welcomed the participants and informed them about the scope of the training programme. The Chief Guest of this occasion, Dr. PS Naik, Project Co-ordinator, CPRI, Shimla delivered his inaugural address. He emphasized about the need of judicious use of water in potato production through adoption of water saving techniques, such as drip irrigation.

During the valedictory function on 3rd December, 2009, a number of questions were raised by the trainees, which were answered by the scientists to their satisfaction. The participants, in general, desired to know more about the improved potato varieties, control of late blight and other diseases of potato. The participants also requested for holding more of such training programmes. Er. Manjit Singh, in his closing remarks, hoped that the knowledge gained by the participants shall reach the ultimate beneficiaries, i.e. farmers.

Training of farmers at CPRS, Patna

One day training programme on Potato seed production; Scientific potato cultivation and Late blight management was organized at CPRS, Patna on 25-09-09, 14-10-09, 28-10-09, 10-11-09 and 18-11-09. A total of 240 farmers of Vaishali, East Champaran, Madhepura, Katihar, Gaya and Jahanabad participated in these programmes. Different aspects of potato like land preparation, use of improved seed, fertilizer management, weed management, insect pest and disease management and potato processing were also explained to the farmers through live demonstrations.

Training under Krishi Vikas Shibir organized by Govt. of Bihar

Drs. S.K. Singh and Barsati Lal participated in the training programme organized by ATMA, Patna and Nalanda and imparted training to farmers on various aspects of potato production and marketing in Bikaram and Sardar Bigha blocks of Patna and Nalanda districts of Bihar on 19-09-09 and 12-10-09.

Participation in kisan mela-cum exhibition

CPRS, Patna participated in “Krishi Updan-cum Kisan Mela” jointly organized by Agricultural Technology Management Agency (ATMA), Patna and Dept. of Agriculture, Govt. of Bihar on 1st and 2nd November, 2009 at Sachidanand Sinha Library compound, Patna. Potato exhibit displayed by CPRS, Patna was judged best stall and bagged first prize in the Kisan Mela. Dr Barsati Lal, Dr. T.K. Sinha and Sh Yogesh participated and displayed the exhibits in the above fair.

Training of Group D staff at Institute

Training of group D (Non-matric/Non-ITI) staff was conducted at CPRI, Shimla and all its regional stations located at Modipuram, Jalandhar, Patna, Gwalior, Kufri-Fagu, Ooty and Shillong during June, 2009. All the group D staff of Institute successfully completed this training.

Live phone-in programmes at Shimla and Patna

Drs. JS Minhas, Principal Scientist and Brajesh Singh, Senior Scientist participated in Live-Phone-in-Programme on "Potato storage and value added products". Drs. Vinod Kumar and Ashwani Kumar, Senior Scientists from CPRS Kufri also participated in Live-Phone in Programme on "Precautions before planting of potato in mid hills of Himachal Pradesh" at Doordarshan Kendra, Shimla. Drs. NK Pandey and MC Sood participated in Live Phone-in-Programme on "Fertilizer Management and Marketing of Potato" on All India Radio, Shimla.

A Television programme “Aloo phasal sangoshthi” was arranged jointly by Doordarshan Kendra and CPRS, Patna at CPRS campus on 18-11-2009. In this interactive programme farmers and scientists sit together and queries of farmers
related to potato crop cultivation, seed production and processing, etc were answered by the scientists through on-spot replies. Drs. R.P. Rai, Head, Gulab Ram, Shambhu Kumar, S.K. Singh and Barsati Lal of CPRS, Patna and Sh. S.V. Verma and his team from Doordarshan participated in this programme.

Programme of DST-GMW-CP on rural energy organised at Shimla

A programme on rural energy project implementation was organized at CPRI Shimla during 23-24th November 2009. The programme was hosted by Himalayan Research Group, Shimla at CPRI campus. During this programme, it was emphasized that 21st century is the century of knowledge. In every sphere of life we are always working for new innovations and developing technologies which make life comfortable and sustainable. There is a large number of institutes, organisation and individuals involved in pursuit to develop process and products to suit the requirements of mankind. It is always felt that technologies developed in laboratories do not reach the remote and rural people. Department of Science and Technology has the division which looks for extension of technologies from lab to land through a dedicated network of community based scientific groups and institutes to achieve the desired level of technology extension for equity, empowerment and development of people residing in rural areas of the country.

During this two days workshop, projects ranging from rural energy needs under DST sponsored coordinated programme and other projects in different fields such as processing of wild edible plants, irrigation technologies for cold deserts, earthquake disaster mitigation through innovative income opportunities in J&K, monitoring of pesticide residues in Kashmir apple and rural housing technologies were assessed for their progress. Implementations of these activities from diverse fields are able to generate employment and entrepreneurship at grass root level in remote areas and helps in managing the different socio-economic and environmental problems. It is clear that implementation of energy initiatives in rural areas are likely to contribute by reducing the impact of much talked about climate change and make people aware about new options and clean technologies in the time to come at local level to live their life in a sustainable manner.

Free exchange of views and suggestions during the workshop is expected to help the investigators in achieving the useful results.

Important Meetings

Workshop on IT application in horticulture

A Workshop on “Information Technology Applications in Horticultural Crops” was held at Central Potato Research Institute, Shimla during August 24-25, 2009. The workshop was attended by about 80 participants including ADG (Hort.-II), ICAR, 12 directors of different Institutes/Directorates/NRCs of Horticulture Division of Indian Council of Agricultural Research, Heads of regional stations of ICAR Institute's located at Shimla and representatives from National Informatics Centre, New Delhi. While welcoming the participants during Inaugural Session, Dr. SK Pandey, Director, Central Potato Research Institute, Shimla mentioned that Information Technology is a Mantra for success in 21st century. He also thanked Dr. HP Singh, DDG (Horticulture), ICAR for giving opportunity to Central Potato Research Institute, Shimla to organize the workshop which is of great importance in present context. Chairman of the Inaugural session Dr. RK Sood, Secretary (EC), State Council of Science, Technology and Environment, Govt. of Himachal Pradesh, Shimla, in his remarks stated that this is a challenging period after industrial revolution, things are changing drastically and as a consequence, new challenges are emerging. This requires change in thinking and planning and thus information technology has an important role to play in present scenario as we are not alone. We are interdependent in the system so any planning we do must be sustainable. For this, very important ingredient is information. Information technology is helpful in to collecting, managing and integrating the available information for sustainable planning.
the challenges of 21st century only if we are prepared. The research in agricultural sciences leading to Green Revolution has disproved the Malthusian Theory. Many other revolutions are also taking place. Science has made a lot of progress and a lot of information is generated in different fields. However, any science has got a cost factor. Therefore, the information generated should be utilized properly. Information technology plays an important role in bringing all the knowledge together. Like in some other branches of science, in communication also revolution has taken place and it has enhanced the efficiency of the uses of Information Technology (IT) to properly utilize the knowledge generated. Till the end of last century, IT knowledge was not managed properly and its proper use was lacking. Use of IT in ICAR system is rather new thus, this workshop was organized so that the scientists working on IT to get an opportunity to learn from the experiences of each other and explore the ways and means to augment the use of IT in agriculture and particularly horticulture.

books and other IT initiatives. Besides, there were three more presentations in the Special Session on ARISoft solution developed at IISR, Calcutta, initiatives of NIC in ICT dissemination for horticulture and on bio-informatics for genome analysis of plants.

DDG (Horticulture), ICAR advised that all the Institutes/NRCs/ Project Directorate of Horticulture Division of ICAR will start office automation in phased manner. In the initial stages, few aspects are to be covered and later on slowly and slowly all the administrative and financial aspects have to be integrated for office automation. In the workshop, six working groups on GIS; Decision Support Systems, Precision Farming & Expert Systems; Office Automation; Bioinformatics; Germplasm Management and Disease Forecasting have been identified to prepare the road maps for implementing/integrating various programmes of Information Technology on Horticultural Crops.

CAC and CIC meeting of NAIP held at CPRI

The third consortium advisory committee (CAC) and consortium implementation committee (CIC) meeting of NAIP sub-project "Value Chain on Potato and Potato Products" was held on 24th July 2009 at CPRI, Shimla. The meeting was held to review the progress of the project and address the issues related to implementation of the project. In all 26 participants attended this meeting. The presentations of all the partnering institutions were given by their respective associates. From CPRI, Dr. BP Singh, CPI of the project gave detailed presentation of overall activities being taken up in this project. Dr. SK Pandey, Director, CPRI congratulated the associated scientists for their good work and expressed his confidence in completion of project targets within the stipulated time frame.

Invited Lectures & Visitors

Potato genome laboratory inaugurated by DDG (H)

Dr. HP Singh, Deputy Director General (Horticulture), Indian Council of Agricultural Research, inaugurated the Potato Genome Laboratory at Central Potato Research Institute, Shimla on 25.08.09. An ultra-high throughput DNA sequencer (GS FLX Titanium) has been installed in the laboratory which is unique in the ICAR system and placed Shimla in the world map of high throughput DNA sequencing. The GS FLX Titanium is the 'Gold Standard' for the next generation sequencing (NGS) technologies and has the ability to generate about 400-500 million base pair high quality sequence data in a single run and can be used for de novo sequencing, re-sequencing, transcriptomics, metagenomics, deep sequencing of amplicons, etc. This ultra-high throughput sequencer will expedite the potato genome sequencing project being financed in India exclusively by the Indian Council of Agricultural Research as a partner of a multinational consortium (Potato
activities undertaken by the institute triggered a revolution in potato cultivation in the country. As a consequence of which the country has emerged as the third largest potato producer in the world. To compensate the imminent gap in cereal production, India has set an ambitious target of 50 million metric tons of potato production annually by the year 2020 compared to about 25 million metric tons now. To achieve this target we have to develop varieties that can produce 35-40 metric tons/ha within 65-70 days in a sustainable manner under relatively warmer climatic condition. This can only be achieved by using the modern genome-based research tools being created in the facility.

For critical investigation of complex biological processes like tuberization, yield, disease resistance etc. and to enable rapid, genome-based breeding strategies, having access to a genome sequence, at least a draft genome sequence, is imperative. With access to the potato genome, researchers would have access to the full gene complement of potato. Furthermore, map-based approach of potato genome sequencing would enable rapid conversion of the sequence data into genetic markers. The sequence data generated in this project would be used for gene discovery, marker development, evolutionary and plant diversity studies, improved breeding, and engineering of new phenotypes. Several scientific communities will utilize this sequence as the importance of potato spans agriculture, basic plant biology, biochemistry, and comparative genomics. The primary users will be universities, public sector institutes as well as government and industrial potato biologists/breeders that are involved in research in understanding biological and agronomic processes in potato. The genome sequence will be high value resource for gene discovery, positional cloning, and marker/genotype development.

The institute would take up functional genomics work for the targeted traits, i.e., tuberization and late blight durable resistance as follow up action of potato genome sequencing. Though, few of the genes involved in tuberization process of potato have been identified, much is still left, to completely understand the process and its environmental control. The project aims at identifying genes involved in sensing temperature signal during tuberization. Once such genes are identified, attempts will be made to generate thermoinsensitive potato varieties so that its cultivation can be extended to warmer areas. Similarly, late blight resistance is a complex process that requires continuous refining to keep one step ahead of the pathogen. It is proposed that genes involved in late blight resistance and their interaction will be studied to work out novel resistance strategy. This can only be done, once the draft genome sequence is available.

**ASRB Chairman visits CPRI**

Dr. C.D. Mayee, Chairman, A.S.R.B., New Delhi visited CPRI during August 2009. He interacted
with various scientists during his visit to CPRI laboratories and also visited the potato farm at Kufri and Fagu. On 16th August, 2009, he inaugurated the Fagu complex and the water harvesting tank. Besides, he gave a general view of the activities of ASRB being taken up in the present scenario during his address to the scientific staff of the Institute.

**Scientist meet at CPRI, Shimla**

Scientist meet is a regular activity of the Institute, where on Fridays, scientists, technical workers and research associates meet to discuss & deliberate on latest & emerging R & D issues. Following lectures were delivered & discussed during the last 6 months:

**Denise of Dr. RS Marwaha, Head, CPRS, Jalandhar**

Dr. RS Marwaha, a very renowned Biochemist of CPRI, passed away on 1st September, 2009. He was born on 1-9-1949 and had done his doctorate degree from IARI, New Delhi in the year 1975. He joined CPRI in October 1977 and contributed to potato R&D activities in various ways. He was well decorated scientist with awards like Hari Om Ashram, ICAR Team, Kaushalya Sikka, S Ramanujam Awards, besides having good number of international publications of repute. He was selected as Head of CPRS, Jalandhar w.e.f. 22-08-09. The entire CPRI family prays for the departed soul.

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<tr>
<th>Date</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>31.7.2009</td>
<td>Sudhakar Mathur, Eppendorf</td>
<td>Liquid handling automation and micro-array applications</td>
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<tr>
<td>16.8.2009</td>
<td>Dr CD Mayee, Chairman ASRB</td>
<td>Address to scientists</td>
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<td>18.9.2009</td>
<td>Vivek Thakur, Axis Bank</td>
<td>Salary accounts and saving options</td>
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<td>20.11.2009</td>
<td>Dr R. Ezekiel</td>
<td>Potato production in North Korea</td>
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<td>20.11.2009</td>
<td>Dr SK. Kaushik</td>
<td>Environmental risk assessment of GM crops</td>
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<td>4.12.2009</td>
<td>Dr ML. Sharma, Icon Analytical</td>
<td>Application of electron microscopy in biological sciences</td>
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<tr>
<td>4.12.2009</td>
<td>Mr Sourabh Narang</td>
<td>Application of electron microscopy in biological sciences</td>
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<td>9.12.2009</td>
<td>Dr Nelles Wayne, CIP</td>
<td>Learning resources for potato systems</td>
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**Appointments**

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<tr>
<td>Dr. Vinay Sugar</td>
<td>Sr. Scientist, Plant Pathology</td>
<td>28-07-09</td>
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<tr>
<td>Dr. RS Marwaha</td>
<td>Head, CPRS, Jalandhar</td>
<td>22-08-09</td>
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<tr>
<td>Dr. (Ms) Jeevalatha A.</td>
<td>Scientist, Plant Pathology</td>
<td>29-08-09</td>
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<tr>
<td>Dr. Prem Chand Meena</td>
<td>Scientist, Agricultural Economics</td>
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**Promotions**

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<td>Sh. Santosh Kumar, LDC, CPRIC, Modipuram</td>
<td>Sr. Clerk</td>
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<td>Sh. Deep Ram, L.D.C. CPRI, Shimla</td>
<td>Sr. Clerk</td>
<td>17-08-09</td>
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<td>Sh. Chanda Ram, Sr. Clerk, CPRI, Shimla</td>
<td>Assistant</td>
<td>15-07-09</td>
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<td>Smt. Shashi Bala Thakur, Stenographer</td>
<td>Personal Assistant</td>
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**Supporting**

All the Group "D" staff including Matric/Non-Matric/Non-ITI were re-designated as Skilled Support Staff in the upgraded Group-C revised Pay Band -I of Rs. 5200-20200+ Grade Pay of Rs. 1800 w.e.f. 01.01.2006.

**Transfers**

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<td>ICAR Research Complex for NEH Region, Umiam</td>
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<tr>
<td>Dr. Med Ram Verma, Sci. Sr. Scale</td>
<td>CPRI, Shimla</td>
<td>IIVR, Bareilly on selection as Senior Scientist</td>
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<td>Sh. Kulwinder Singh, T-2</td>
<td>CPRI, Shimla</td>
<td>CPRS, Jalandhar</td>
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<td>Sh. Vijay Kumar Rai, T-2</td>
<td>CPRS, Patna</td>
<td>CPRS, Jalandhar</td>
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<td>Smt. Bindra Gupta, Asstt. Clerk</td>
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<td>CPRI, Shimla</td>
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<td>Sh. Sandeep Verma, Sr. Clerk</td>
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<td>CPRI, Modipuram</td>
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<tr>
<td>Smt. Daishy Tuli, LDC</td>
<td>CPRS, Gwalior</td>
<td>CPRS, Jalandhar</td>
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<tr>
<td>Sh. Bijender Singh, Skilled Supporting Staff</td>
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Retirements

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<tr>
<td>Sh. Sarju</td>
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<td>Dr. VS Khushwah</td>
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<td>31.07.2009</td>
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<td>Sh. Des Rah</td>
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<td>Dr. PH Singh</td>
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Demises

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Honours, Awards & Foreign Visits

Shivashakthi Life Time Achievement Award

Dr. Suman Kumar Pandey, Director, Central Potato Research Institute, Shimla was awarded the prestigious Shivashakthi Life Time Achievement Award of the Horticuture Society of India for his outstanding work on potato research in the country. Dr. Pandey has more than thirty-seven years of experience in potato research and development, especially in the field of potato breeding, biotechnology, cell and molecular biology and genomics. His leadership in the field of breeding for processing grade varieties resulted in quick development of a number of suitable varieties like Kufri Chipsana 1, Kufri Chipsana 2, Kufri Chipsana 3, Kufri Himsona, Kufri Frysona and suitable technologies for production and storage of processing grade potatoes under sub-tropical condition that revolutionized potato processing sector in India. He also developed specialized varieties like Kufri Gitraj, Kufri Sutlej, Kufri Jawahar, Kufri Pukhraj, Kufri Shailja, Kufri Pushkar, Kufri Arun, Kufri Himalini and the first ever heat tolerant variety Kufri Surya that has the potential to mitigate the ill effects of global warming on potato cultivation. The TPS progeny 92-PT-27 developed by his group is gaining popularity in India and abroad. He identified and registered thirteen elite potato germplasm and patented a technology for micro-tuber production. He also contributed immensely in the development of transgenic potato suitable for cold chipping, and for late blight field resistance. He has more than 250 publications in various national and international journals in addition to nine books to his credit. Dr. Pandey has visited several foreign countries including USA, Russia, Thailand, Tajikistan, Afghanistan and Peru. He is the recipient of several prestigious awards including ICAR Outstanding Multi-disciplinary Team Research Award (1997-99), JC Anand Gold Medal (2005) from Horticultural Society of India, Indian Potato Association-Kaushalya Sikka Award (2005), IFFDC Award (2005), Shri LC Sikka Endowment Award from National Academy of Agricultural Sciences, Dr. S. Ramanujam Award (2007) from Central Potato Research Institute (ICAR) and the coveted Rafi Ahmed Kidwai Award (2006) from ICAR. He is the Fellow of Indian Potato Association, Horticultural Society of India, National Academy of Agricultural Sciences and National Academy of Sciences, India, Allahabad.

Kaushalya Sikka Award

The Kaushalya Sikka Award of Indian Potato Association, Shimla for the block year 2005-2009 was bestowed upon Dr. Dinesh Kumar and his colleagues for their research contribution in developing information capsule on processing quality parameters of potatoes grown...
under subtropical climatic conditions of India. They have generated information on biochemical factors governing potato processing quality right from developing stage to the storage. This information is of immense help to researchers to develop better varieties and technologies for potato processing; to growers for getting more profit and to the industry in getting quality raw material from different parts of the country on sustainable basis. The research work is expected to provide boost to the development of potato processing sector in the country. His team included Drs. SK Pandey, R Ezekiel, SV Singh, RS Marwaha, BP Singh, Brajesh Singh and Parveen Kumar of CPRI.

Associateship of NAAS

Dr. Brajesh Singh Senior Scientist (Pl. Physiology), Division of Crop Physiology and PHT, Central Potato Research Institute, Shimla, Himachal Pradesh has been selected as associate of the National Academy of Agricultural Sciences w.e.f. January 1, 2010.

Foreign visit of CPRI Scientists

- Dr. BP Singh, Joint Director, Central Potato Research Institute Campus, Modipuram was deputed for executive development programme on "Food and Agri Business Management Programme" held at Cornell University, Ithaca, NY, U.S.A., during June 24 to July 2, 2009.

- Dr. SK Luthra, Sr. Sci. CPRI Campus, Modipuram attended training on "Germplasm evaluation for biotic and abiotic stress" at CIP-Lima Peru during August 24-Sept.18, 2009.

- Drs. SK Pandey, Director, CPRI, Shimla, PM. Govindakrishnan, Principal Scientist, Rajesh Rana, Sr. Sci. CPRI, Shimla and SV Singh, Principal Scientist, CPRI Campus, Modipuram attended "Enhanced food and income security in SWCA through potato varieties with improved tolerance to abiotic stress" project meeting in Tashkent, Uzbekistan during Sept.17-19, 2009.

- Dr. Vinay Singh, Sr. Sci. & Er. Sukhwinder Singh, Sr. Scientist, CPRI Campus, Modipuram participated in Training/study visit on aeroponic technology for Seed Production at Chinese Academy of Agricultural Sciences (CAAS) in Beijing, China, which was organized by International Potato Center (CIP). The training was held during Sept. 26-30, 2009.

- Dr. R Ezekiel, Head, Division of Crop Physiology, Biochemistry & Post Harvest Technology, Central Potato Research Institute, Shimla visited DPR Korea, as Consultant in the area of potato storage under FAO sponsored consultancy programme held in DPR Korea, from October 13-20, 2009.

- Dr. SK Kaushik, Sr. Scientist, Central Potato Research Institute Shimla attended a short-term exchange programme (STE) on the topic "Environmental Risk Management" involving broader regulatory and policy topics of interest in agricultural biotechnology at ST. Louis, Missouri and Washington, DC, USA during October 26-30, 2009.

- Dr. SK Pandey, Director, CPRI, Shimla was invited to present a paper in the 15th triennial symposium of the International Society for Tropical Root Crops (ISRTC) at CIP, Lima Peru during November, 2-6, 2009.

- Dr. BP Singh, Joint Director, CPRIC, Modipuram participated in the follow-up Beijing meeting at Bellagio, Italy from November 16-20, 2009.

- Dr. S Ramani attended start up planning workshop for Austrian Development Agency Project "Development and application of ecological approaches in pest management to enhance sustainable potato production of resource poor farmers in the Hindu-Kush Himalayan region of Bhutan, Nepal, Pakistan and India (Sikkim)" at Kathmandu, Nepal from 24-26 November, 2009.

Inter-Zonal Sports meet

After winning ICAR Zonal Sport Tournament in Table Tennis, Badminton & Volleyball Shooting at IISR, Lucknow, CPRI contingent participated in ICAR Inter-Zonal Sports Meet at NDRI, Karnal and brought pride for CPRI by winning...
Gold in Badminton (Sh. Surinder Pal, Sh. Sachin Kanwar & Dr. Shashi Rawat), Silver in Volleyball Shooting (Dr. Shashi Rawat, Sh. NK Sharma, Sh. Om Pal Singh, Sh. Sheesh Ram, Sh. Yogesh Gupta, Sh. Hoshiar Singh, Sh. Pradeep Upadhayay, Sh. Som Dutt, Sh. JS Jassal) and Bronze in Table Tennis (Sh. Chander Mohan Bist, Dr. Vinay Bhardwaj, Sh. Roshan Lehri).

**Future Activities**

**Training Courses**
- A two days training for field functionary/federation members from Uttarakhand on "Production technology of potato/association mechanism of CPRI" is planned to be held at CPRI, Shimla in the month of February, 2010.
- A 10 days training programme for field functionaries of ITC on "Potato crop improvement and technologies" is planned during February, 2010.

**Potato Facts**

High potato output in India expected

India's potato output is likely to rise by 5.1 percent to a record 32.7 million tonnes in 2009/10 as higher prices prompted farmers to cultivate the tuber crop on more area, a senior official said on Friday. "Because of scanty rains in some areas they (farmers) have not cultivated paddy crop. They covered this area with potato. Market prices are also high," R.P. Gupta, Director, National Horticultural Research and Development Foundation (NHRDF), told Reuters in an interview.

In an other estimate, India's potato output could rise by six per cent to eight per cent in 2009-2010, according to traders and analysts. In 2008-09, the output was placed at 260 lakh tonnes, down from the high of 305 lakh tonnes in 2007-08. "With potato fetching a better price this year compared to the previous years a number of farmers who had either left their land barren or gone for sowing of other crop will come back," said Mr. Sachind Madan, director at Technico Agri Sciences, a subsidiary of the cigarette to hotel major ITC Limited. Increased production would mean that prices which have already risen year on year by over 100 per cent should begin to moderate. Mr. Madan for one is confident that prices could possibly touch as low as Rs 5 per kg by the end of the current month even as arrivals from key producers like Punjab, Madhya Pradesh and Himachal Pradesh begin to firm up. Potato prices were ruling as recently as October/November at Rs 14-15 per kg in the wholesale markets. Part of the optimism of a higher crop stems from the fact that sowing operations is still on in key producing states like West Bengal and Bihar besides Karnataka. Potato acreage in India stood at 16 lakh hectares in 2008-09, which is also expected to rise by another five to six per cent. However despite the optimism, traders like Mr. Sukhjit Singh Bhatti, president of the Jalandhar based Confederation of Potato Seed Farmers have a word of caution. "We could get a bumper crop which will largely depend on the weather conditions in December and January," he adds.

Source: Internet

From potato peel to biogas

Once destined for the landfill, potato waste from Cavendish Farms’ potato processing facilities is now being used to power the company’s boilers in their processing plant at New Annan, Prince Edward Island in Canada. The biogas facility takes the solid waste material, and through anaerobic digestion, converts it into energy for the Cavendish Farms processing plants.

Source: Internet

Canada adds acrylamide to toxic substance list

Health Canada has added acrylamide, a substance found in French fries and potato chips, to the government’s list of toxic substances. Acrylamide first came onto the health and safety agenda in 2002 when scientists at the Swedish Food Administration reported unexpectedly high levels of acrylamide in carbohydrate-rich foods and published evidence linking the chemical to cancer in laboratory rats. Food manufacturers have come under consumer pressure to come up with
ways to cut levels of acrylamide in these foods, but now in Canada, the pressure is coming from government.

Source: Internet

Belarusian scientists create unique GM potato plants

MINSK - The website yarmarka.net reports that genetically modified potato plants resistant to Colorado potato beetle were created by a group of Belarusian scientists, according to a head of the Laboratory of Molecular Genetics of Belarus Nikolai Cartel. "The unique transgenic potato resistant to Colorado beetle as well as potato with chitinase gene, providing resistance to fungal pathogens, are the most promising developments of our scientists", said Cartel. According to the head of the laboratory, currently these transgenic plants are tested under laboratory conditions. "Unfortunately, the reason for the slow introduction of transgenic potatoes in industrial farming is the lack of special conditions for the active analysis and testing of these plants in an industrial environment", said Karel. He also added that in 2010 Belarus will create two sites for testing GM-potatoes.

Source: Internet

Article on Potato

Efficient Nutrient Management in Potato Crop Production

The capacity to produce usable potato plant biomass depends upon the adequacy and balance of macro and micro-nutrients in the plant. Potato is one of the most sensitive crops to low nutrients supply of soils, i.e., potato is a plant of lower nutrient efficiency than cereals like wheat, rice etc. Potato being a shallow rooted crop the fertilizer use efficiency for N is 40-50% and for K it ranges between 50-60% while it is only 10-15% for P.

The basic philosophy of nutrient management should be to apply fertilizers at rates to ensure high fertilizer use efficiency so that the cost of cultivation of potato is reduced as well as the amount of unutilized fertilizers is also reduced to environmentally acceptable levels. Following information on role of nutrients/deficiency symptoms; and on suitable source, dose, time and method of fertilizer/manure application can be of help to efficiently manage nutrient requirement of potato crop.

Role of nutrients in potato

Fertilizer nutrients NPK and micronutrients promote root and shoot growth and tuber yield. Nitrogen increases plant height, number and size of leaves, leaf area duration, thickness of stem, tuber initiation, number and size of tubers. Phosphorus promotes early growth, plant height, number of shoots, leaf area index (LAI), leaf area duration, size and number of tubers particularly small size tubers. Potassium increases leaf expansion particularly at early stages of growth, extends leaf area duration by delaying leaf shedding near maturity. It aids in translocation of photosynthates from leaf to tuber. It increases both the rate and duration of tuber bulking. Potassium increases the size of tubers and not the number. It provides resistance against frost and diseases. Micro-nutrients play a specific role in the growth and development of a plant. Even though these elements are needed in only minute quantities, many soils do not supply them in sufficient quantity for healthy growth and optimum yield of potato. Potato plants produce specific deficiency symptoms under nutrient stress conditions (Plates 1 to 5).

Vital aspects of nutrient management in potato

Optimum rate of fertilization

General recommendations: The optimum rate of NPK fertilization in different zones based on tuber yield response in trials conducted in different potato growing agro-climatic zones in India is given in Table 1. The mean response to optimum doses of N, P and K fertilizers was 116, 46, and 51 q/ha, respectively (Table 1). Processing varieties of potato Kufri Chipsana 1 and Kufri Chipsana 3 and the likes grown specifically to produce large processing grade tubers require higher rate of fertilization for by 33 to 50% than recommended.

Soil test for nutrient management:

Fertilizer management of potato crop is usually based on averages on regional basis known as package of practices. Such an approach results in suboptimal or excessive application of inputs resulting in inefficient utilization of costly fertilizers on one hand and risks environmental degradation on the other. Moderation in rate of fertilization is possible on the basis of soil test value (STV). Soil test based fertilizer recommendation results in fertilizer economy through balanced application and enhances tuber yield. Soil tests are more reliable, convenient and efficient as they are performed before planting the crop to decide on rate of fertilization precluding nutrient imbalances in the crop. Therefore, to save on fertilizer input, apply fertilizer based on soil test values after getting soil tested from soil testing laboratories. Some of the
rows at earthing up is equally efficient to other sources of N.
- Urea alone at planting in excess of 60 kg N/ha is harmful for emergence of potato.

Phosphorus:
- Readily soluble sources of P viz., single super phosphate (SSP), triple super phosphate (TSP) and DAP are more suitable for potato.

Potassium:
- Although potassium sulphate has been found to be best in term of its beneficial effect on tuber quality viz., dry matter, ascorbic acid and sugar content but due to its high cost, it has not found much use in potato crop. However, in sulphur deficient soils, it can be more effective because of its presence in it.
- The potassium chloride (KCl) is commonly used in potato crop and constitutes 97% of K fertilizers consumption in potato.

Micronutrients:
- If soil is deficient in any of the micronutrients, it can be applied through soil, foliar spray or seed tuber treatment (Table 2), but for iron and boron, foliar spray method should be preferred. The foliage spray should be avoided between 11 am to 3 pm. The micronutrients could be sprayed mixed with fungicides for spray purpose.

Method and time of fertilizer application
- Split application of N (1/2 at planting + 1/2 at earthing) is essential for maximizing efficiency. Spraying 2% urea solution 40-50 days after planting corrects mild visual deficiency symptoms of N, if any.
- Split application of K is advantageous only in light textured loamy sand soils.
- No benefit from split dose of P is reported, because it is required mostly for early root and shoots growth.
- Only small benefits of foliar application of P and K are reported in case of visual deficiency of these nutrients in crop.
- Band placement of P fertilizers invariably is better than broadcast, because of fixation of P in most soils. However, methods of placement of K fertilizers in band at sides or above or below seed tubers or broadcast were equally efficient.

Organic farming in potato:

There is a resurgence of interest in organic farming globally, which holds sustainability of natural resources and environment supreme along with nutritional quality of produce. The profitability of organic farming depends, on the higher prices that its products command in the market place. Much severe mean tuber yield loss of 35.3% in organic farming compared to 100% mineral fertilizers treatment was recorded in initial 3 years result of a long term experiment...
on organic farming at Modipuram, India.

Sustainable integrated nutrient management

It recommends conjoint application of chemical fertilizer, organic manures and bio-fertilizer, in addition to inclusion of legumes in cropping systems and incorporation of on and off-farm generated crop residues to constitute an efficient integrated nutrient management strategy. Integrated nutrient management through green manuring before potato once in 2-3 years, manuring with farmyard manure and incorporation of crop residue into the soil maintains soil fertility and help sustain productivity. Application of 15 t/ha of FYM takes care of the half of fertilizer phosphorus and potassium requirement of the crop, whereas 30 t/ha of FYM can take care of whole of fertilizer P and K needs of the crop. Therefore, adjust the dose of P and K fertilizers according to the dose of FYM applied. Role of green manuring in INM is to supplement nutrients in combination with chemical fertilizers and to improve physical condition of the soil. Green manuring usually does not help save or reduce N fertilizer needs of potato, yet for fixed yield targets, some saving in nitrogen is possible, because tuber yield level is raised by green manuring. Green manuring helps achieve 30-50% higher produce of tubers of uniform shape and size, and superior quality.

Organic farming usually results in lower tuber yield compared to cropping with mineral fertilizers. It is despite the fact that application of organics in integrated nutrient management results in improved crop yield and quality of tubers than mineral fertilizers alone. Potato tuber quality, taste and flavour improve mainly through increased dry matter, starch, vitamin C, protein content and quality, and decreased free nitrates in tuber and storage losses.

It is concluded that monitoring nutrient imbalances in soil through soil test is essential for moderation in rate of fertilization of potato crop in the long term for sustained productivity and economy. Incorporation of crop residues/green manure into the soil should be an integral part of nutrient management to maintain soil fertility and sustain productivity.

-SP Trehan & SK Pandey

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<th>Table 1. Optimum fertilizer requirement of potato crop in different potato growing zones of India</th>
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* Sikkim and West Bengal hills

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<tr>
<td>Ammonium molybdate</td>
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<td>Sodium borate</td>
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हिंदी समाचार

संस्थान ने मनाया हिंदी चेतना मास

संस्थान के मुख्यालय में हर वर्ष की भाषा इस वर्ष भी सितंबर-अक्टूबर माह में हिंदी चेतना मास का आयोजन किया गया।

14 सितंबर, 2009 को ‘हिंदी दिवस’ के अवसर पर हिमाचल प्रदेश भाषा एवं संस्कृति विभाग के निदेशक डा. प्रेम शर्मा बतौर मुख्य अधिकारी और मुख्य वक्ता के रूप में उपस्थित थे। उन्होंने वक्तव्य में डा. प्रेम शर्मा ने भाषा और सूचना की भाषा की पहचान बताया। उनका दावा था कि राष्ट्रीय धार, राष्ट्रीय गान के समान हमें अपनी भाषा को भी पूरा मान-समान देना चाहिए।

उन्होंने इस बात पर दुख व्यक्त किया कि कर्मचारियों को हिंदी की याद केवल सितंबर में ही आती है और साल में हर वर्ष कलेक्टर अंग्रेज़ी में ही काम करते हैं। उन्होंने भीन, ज्ञान, जरूरी व रूति का उद्देश्य देने हुए अपनी भाषा में सरकारी काम करने पर मदद किया।

संस्थान में राजभाषा के प्रचार और प्रसार का हवा देने हुए सरकारी निदेशक (राजभाषा) श्री प्रीतींचंद ने भारत सरकार की राजभाषा नीति और उसके कार्यान्वयन पर प्रश्न डाला। उन्होंने कहा कि ये सभी कार्यान्वयन में पहले की तुलना में हिंदी की प्रगति की है किन्तु इसके लिए सभी कर्मियों को भिड़कर कार्य करना होगा। अपने संबोधन में संस्थान के निदेशक डा. सुमन कुमार पाण्डेय ने कर्मचारियों का आदेश किया कि वह संस्थान के काम को हिंदी में प्राप्त न करने और नियमित तौर पर पुस्तकालय में उपलब्ध पुस्तकों का नाम लें।

एक माह तक चलने वाले इस कार्यक्रम के दौरान हिंदी निबन्ध, नोटिंग एवं ड्राफ्टिंग, हिंदी टाइपिंग, प्रस्तुति, समग्र संस्कार, चित्र कहानियों और वैज्ञानिक लेख-लेखन जैसी प्रतियोगिताओं का आयोजन किया गया।

पुरस्कार वितरण समारोह

प्रशिक्षक, कम्यूटर पर हिंदी कार्यों को बदलने का सुझाव भी दिया। इस अवसर पर संस्थान के हिंदी प्रकाशनों, आलू-उत्पाद, व आलू की नवीन किताबों के प्रदर्शन भी लगाई गई।

मोदीपुरस परिसर में हिंदी पखवाड़ा

संस्थान के मोदीपुरस परिसर में हिंदी पखवाड़ा का उत्साहन देखने ही बना। हर वर्ष के अधिकारियों और कर्मचारियों की भागीदारी इस आयोजन को सफल बनाने में अत्यंत भूमिका रही। परिसर के संस्थान निदेशक महोदया ने 14 सितंबर, 2009 को हिंदी पखवाड़ा का उत्साहन किया। पन्हर दिन चलने वाले इस कार्यक्रम में अलग-अलग दिन अलग-अलग हिंदी प्रतियोगिताओं का आयोजन किया गया।

मोदीपुरस परिसर में हिंदी पखवाड़ा
'पर्यावरण संसर्ग: आवश्यकता, संकट एवं समाधान' विषय पर आधारित अनुभवात्मक प्रतियोगिता में 14 प्रतिभागियों ने अपने विचार प्रकट किए। निरंकुश, कम्युनिटी पर हिंदी टाइटल, सामान्य शान, हिंदी नोटिंग एवं ज्ञान विस्तार जैसी प्रतियोगिताओं ने संबंधित वर्ग के अधिकारियों/कर्मचारियों की मान्यता दिने में प्रभावित दिनों तक परिसर का माहौल हिंदीमय बनाने में कोई कोर-कसर नहीं छोड़ी।

समाधान समारोह के अवसर पर हिंदी के साहित्यकर्मी श्री गुरुदास कुमार 'गुरुदास' जी की मुख्य अधिष्ठान उपस्थित थे जबकि परिसर के संरचना निर्माणक डा. वीर पाल सिंह ने कार्यक्रम की अयोजना करते हुए सभी से कार्यक्रम का सरकारी कामकाज हिंदी में करने का आदेश किया। कार्यक्रम का संबंधित परिसर की हिंदी अनुवादक श्रीमती कुमारी सिंह ने किया।

शिलांग केंद्र में हिंदी दिवस

संस्थान का पूर्वोत्तर राज्य स्थित केंद्र भी 'हिंदी दिवस' मनाने में पीछे नहीं है। इस केंद्र में 12 अक्टूबर, 2009 को बड़ी धुमधाम के साथ हिंदी दिवस का आयोजन किया गया। मुख्य अधिष्ठान के रूप में उपस्थित डा. फिलिप और कार्यकारिणी प्रवक्ता ने अपने संबोधन में केंद्र के कर्मचारियों को हिंदी का प्रयोग करने के लिए उत्साहित किया। केंद्र के अध्यक्ष डा.
के कई स्तर रहे। पुरुषों के लिए आयोजित दोपहिया वाहन प्रतियोगिता ने विशेष रूप से आकर्षित किया।

संस्थान में दीपावली भेल का आयोजन

मुख्य अतिथि के रूप में उपस्थित श्रीमती नीरजा पांडेय ने सभी विज्ञापनों को पुनरायोजन वितरित किया और इस मेले के सफल आयोजन पर बात की दी। आयोजन में सर्वश्रेष्ठ नवेरा कुमार शामी, सचिन कवर और नरेन्द्र कुमार आदि की प्रमुख मूर्तियाँ रही।

मूल्य अतिथि का संबंध

साम्प्रदायिक सद्भावना अभियान

राष्ट्रीय सामाजिक सद्भावना प्रतियोगिता के आयोजन पर माननीय कृषि, उपभोक्ता मामले, खाद्य और सार्वजनिक वितरण मंत्री श्री शशंक पवार के निर्देश पर संस्थान के मुख्यालय में 19-25 नवम्बर, 2009 के दौरान कृषि एकता संगठन ने आयोजन किया गया। इस अवसर पर संस्थान के मुख्यालय में राष्ट्रीय एकता की स्थापना ग्रहण की गई। इससे साथ ही साम्प्रदायिक, जातीय व आतंकी हमलों में शारीरिक और मानसिक रूप से प्रभावित व्यक्तियों के पुर्नवास के लिए चन्द्र एकत्रित किया गया।

मॉडल प्रशिक्षण पाठ्यक्रम

केंद्रीय आलू, अनुसंधान संस्थान, शिमला में 18-25 अगस्त, 2009 के दौरान ‘सुपरपी तकनीक द्वारा बीज आलू उपयोग’ पर 8 विभागीय मॉडल प्रशिक्षण पाठ्यक्रम का आयोजन किया गया। यह पाठ्यक्रम विशेष रूप से हिमालय प्रदेश में कार्यरत बागवानी विकास अधिकारियों व आलू, ग्राहक व संबंधित अधिकारियों के लिए आयोजित किया जाता है। इस प्रशिक्षण पाठ्यक्रम में उत्तराखंड, पश्चिम-बंगाल, उत्तर प्रदेश, मणिपुर, हरियाणा, मेघालय और हिमालय प्रदेश जैसे 7 प्रदेशों के 14 अधिकारियों ने भाग लिया। इस प्रशिक्षण में नंदार्जुलादेश के दो वैज्ञानिकों ने भी भाग लिया।

प्रशिक्षण के दौरान 16 लेखन व 8 प्रैक्टिकल के जरिए प्रतिभागियों को आलू से संबंधित हर विषय की जानकारी दी गई।

सांस्थान में किसान

संस्थान में जुलाई व अगस्त महीने में पश्चिम बंगाल के 56 प्रगतिशील किसानों के लिए दो-दो दिनीय प्रशिक्षण शिविर का आयोजन किया गया। यह प्रशिक्षण 28-28 किसानों के दो संगठनों में किया गया। यह प्रशिक्षण शिविर विशेषकर आलू के विकास से जुड़ी जानकारियों पर फोकस किया। इस दौरान किसानों को संस्थान में कार्यरत

प्रशिक्षण में किसान

संबंधित विशेषज्ञों ने व्याख्यान व व्यवहारिक जानकारी दी। इसके बाद संस्थान के कृषि, व्यावसायिक और सरकारी सूचना प्रयोग फाइलों का दौरा भी करवाया गया। यहां किसानों को प्रत्येक बालू से आलू की खेती फसल व इसके लिए चाकुर की जानकारी दी गई।

भारत के हदय स्थल—मध्य प्रदेश में आलू के बढ़ते कदम

आलू की संख्या उच्च गुणवत्ता स्वस्थ एवं रोग रहित प्रजननक आलू बीज
उत्पादन के लिए कर्मचारियों ने अलग-अलग कंपनियों में अनुसंधान करना शोधकर विश्वम ने यह प्रदर्शन होता है। अपने भाषा के 13 से 170 कंपनियों और इन्हें अलग है पहचान बनाए हैं। इस कंपनी द्वारा उत्पादित प्रजनन बीज विवरणों से उत्पादित आनंद प्रजनन बीज के रूप में पहचान स्पष्ट रूप से उत्पादित कर रहा है। इस कंपनी पर उत्पादित प्रजनन बीज क्षेत्र के लिए अलग-अलग कंपनियों में अगले हैं। इस कंपनी पर उत्पादित प्रजनन बीज ग्राहकों से उत्पादित आनंद प्रजनन बीज के रूप में पहचान स्पष्ट रूप से उत्पादित कर रहा है। इस कंपनी पर 4,000 से 6,000 कंपनियों में पहचान बनाए हैं, जिसमें से 900 से 170 कंपनियों के लिए उत्पादित प्रजनन बीज को अलग-अलग कंपनियों में अलग है पहचान बनाए हैं।

मध्य प्रदेश के उत्पादन के लिए अनुसंधान कंपनियों में 13,000 हेक्टेयर में अलग-अलग कंपनियों में अलग नुकसान होता है। इसका अर्थ यह है कि जबकि प्रजनन बीज के लिए उत्पादित कर रहा है, वहीं उत्पादन के लिए अलग-अलग कंपनियों में अलग है पहचान बनाए हैं।

मध्य प्रदेश के द्वारा उत्पादित करने वाले आनंद प्रजनन बीज के रूप में पहचान होता है। इस कंपनी के लिए 2002-03 में 4,011 एकर के रूप में पहचान बनाए हैं।

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<th>वर्ष</th>
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<th>आनंद प्रजनन बीज का कुल वितरण (कुंटल)</th>
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<th>मध्य प्रदेश द्वारा उत्पादित आनंद प्रजनन बीज की मात्रा (कुंटल)</th>
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सूची 1991-1992 से 2008-2009 तक, कर्मचारियों ने अनुसंधान कंपनियों में आनंद प्रजनन बीज के उत्पादन और वितरण में संचालित फाउंडेशन के रूप में आनंद प्रजनन बीज के उत्पादन, मध्य प्रदेश में वितरण एवं विनिर्माण वायरसों में मध्य प्रदेश में आनंद प्रजनन बीज उत्पादन
केदार वल्लभ भाई जैतेल कृषि एवं प्रौद्योगिकी विश्वविद्यालय, मोदीपुरम, मेघालय आयोजित अर्थव्यवस्था भारतीय किसान मेला एवं कृषि उद्योग प्रदर्शनी का आयोजन किया गया। इस आयोजन पर केंद्रीय आमुक्तांत संस्थान बसिदान, मोदीपुरम ने संस्थान द्वारा विकसित तकनीकों का प्रदर्शन किया गया तथा संस्थान का स्तान का भारतीय कृषि अनुसंधान परिषद गृह में प्रथम स्थान प्राप्त हुआ।

प्रशिक्षण कार्यक्रम में भाग लेने: कृषि सूचना एवं प्रकाशन निदेशालय (DIPA) भारतीय कृषि अनुसंधान परिषद, नई दिल्ली के तत्वावधान में 3-7 नवम्बर, 2009 के दौरान कृषि आधारित रचनात्मक लेखन विषय पर आयोजित प्रशिक्षण कार्यक्रम में मोदीपुरम परिषद के तकनीकी अधिकारी श्री अशोकचंद कुमार ने भाग लिया।

**कृषि प्रसार गतिविधियाँ**

- 28-31 मई, 2009 को लेफ्टनेंट अनिल सिंह मंगोलिया फाउंडेशन, नई दिल्ली द्वारा समस्तीपुर, बिहार में आयोजित 'स्वदेश प्रेम जागृति संगठनी' के अवसर पर राष्ट्रीय कृषि प्रदर्शनी में संस्थान के डा. टी.के. सिंह ने संस्थान का स्तान लगाया। इस अवसर पर संस्थान के निदेशक डा. एस. के. पाप्हेड़ एवं संयुक्त निदेशक डा. बी. पाल सिंह ने उपस्थित थे।

- **वरिष्ठ करियर कॉलेज, वाराणसी (उत्तर प्रदेश)** के रचना जयनाथ समारोह के अवसर पर आयोजित अर्थव्यवस्था भारतीय किसान मेला एवं कृषि उद्योग प्रदर्शनी 2009-10 अक्टूबर, 2009 को केंद्रीय आमुक्तांत संस्थान के स्तान का भारतीय कृषि अनुसंधान परिषद के गृह में प्रथम स्थान प्राप्त हुआ।

पुरस्कार वितरण समारोह के नुस्खा अध्यक्ष डा. एन.बी. सिंह, कृषि आयुक्त, भारतीय सरकार के कमल के द्वारा प्रदान किया गया। मेले का उद्घाटन परिषद के महानीतेश डा. मंगला राय द्वारा किया गया।

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