Dear All,

The important event of this month was a Brain Storming Session on “Post Harvest Technology of Horticultural Crops” held at IIVR, Varanasi during November 24-25, 2009. In this meeting the decisions taken in the last interaction meeting held at IIHR, Bangalore during August 2008 were discussed and action plan was prepared based on the various post harvest activities going on and achievements made at different ICAR institutes. As a result a yahoo group in the name of icarphet@yahoogroups.com to be managed from CIPHET has been formed and all the scientists present during the brainstorming are its members.

A Special Training Programme on Post Harvest Management of Fruits and Vegetables for officials of the Directorate of Horticulture and Food Processing, Ranikhet, Utrtrakhand was organized during 04-13 November, 2009 at CIPHET, Abohar. Utrtrakhand is a leading state which has got all their horticultural officers trained at CIPHET in latest technologies. Two suggestions namely establishing an Utrtrakhand brand for processed foods and having a cold storage facility at each horticultural processing centre were made to the state to make the food processing centres more effective. Similarly it was suggested that entrepreneurs should make the products for the brand of state and the processed produce be marketed by state government through its own outlets or exhibitions.

The Winter School on “Recent Developments in Post-Harvest Processing and Value Addition to Livestock Produce” was a lead taken by the institute in this sector. The winter school was a first of its kind course on live stock product processing conducted in the country.

Another unique initiative, which CIPHET had taken, was to organize the national seminar on food processing in Hindi language. The transfer of technology is effective if done in the local language and for that developing the literature is very important. The national seminar thus conducted has given an opportunity to the scientists to spare some time and translate or prepare papers based on their work in Hindi, which will be useful in developing popular literature further.

We are very happy share with you all that due to sincere efforts of CIPHE T staff in use and promotion of Hindi, CIPHET was awarded a first prize in Institutional category by Ludhiana Hindi Committee of Central Government Employees.

The CIPHET developed technologies such as guava bar, aonla products, green chilli powder, groundnut milk and milk based products, powdering technology for ginger, garlic and onion are being taken up by prospective entrepreneurs for Rs. 11000.00. Every month 3-4 entrepreneurs visit CIPHET and get the training and licensing of the technology.

The Agro Processing Centre concept given by AICRP on PHT is also catching up and central sector scheme has been launched for setting up the APCs. However the state department officials who will implement such schemes also need to be sensitized on this topic and hence Model Training Course on ‘Establishment of Agro Processing Center in rural catchments for processing and value addition activities’ was conducted at CIPHET with sponsorship from Govt. of India, Department of Extension.

WISHING YOU ALL A VERY HAPPY JOYOUS HOLIDAY SEASON AND VERY HAPPY NEW YEAR-2010

With best regards

R.T. Patil
Director
In this issue

Fourth National Conference on KVK-2009 at TNAU COIMBATORE
International Conference on Horticulture –2009 at Bangalore
Brain Storming Session on “Post Harvest Technology of Horticultural Crops-
Present Status and Future Action Plan
International Conference on “Nurturing Arid Zones for People and the
Environment: Issues and Agenda for the 21st Century”
Special Training Programme on Post Harvest Management of Fruits and
Vegetables
Entrepreneurship Development Programme on Aonla Processing
Coordination Committee Meeting of All India Coordinated Research Project on
Application of Plastic in Agriculture
Modernizing Indian Meat industry through post-harvest engineering
interventions
Valedictory function of Winter School on “Recent Developments in Post -
Harvest Processing and Value Addition to Livestock Produce”
Two day National Hindi Seminar on Role of Food processing in rural
empowerment at CIPHET, Ludhiana
National Conference on Virtual and Intelligent Instrumentation
One week training on ‘Post-Harvest Technology for Rural Catchments’
Valedictory session of Post-Harvest Technology for Rural Catchments Training
CIPHET participation in India International Trade Fair 2009 at New Delhi
CIPHET scientists attend Management Development Programme at IIM,
Lucknow
JOINING
Technology of the Month
Publication of the Month
Fourth National Conference on KVK-2009 at TNAU COIMBATORE

The KVK system under ICAR has met the expectations of rural India and Indian farmers with its efficient role in transfer of technology. The KVK are similar to NGOs and hence their delivery is more effective than the government system of transfer of technology. Due to success of KVK system the number of KVKs has reached to 569, having almost one KVK in each district and in XI plan this number is going to be increased to cover two KVKs in each district. The division of Extension under ICAR conducts KVK conference each year where all KVK personnel especially Chief Training Organizers participate to learn about the recent advances in agricultural science and technology through lectures by experts drawn from the human resource available with ICAR. The Fourth National Conference on KVK-2009 was held at TNAU, Coimbatore during November 6-8, 2009. The meet is also useful to share the experiences of KVK scientists, their success stories, innovative technology transfer approaches adopted by the KVKs and successful technologies transferred across the country. In this conference discussions were held on themes related to precision farming, Information and Communications Technology in Agriculture, Farm mechanization and Post harvest technology. Director CIPHET was invited for this conference for presentation of status paper on “Post Harvest Technology for Value Addition and Income Generation in Production Catchments” on November 7, 2009. The chairman of the session was Dr. M.M. Pandey, DDG (Engg.), Co-chairperson was Dr. S. Santhana Bose, Dean, College of Agricultural Engineering, TNAU and Rapporteurs were Dr. Ashok Kumar Singh, Zonal Project Director, Zone-II, Kolkata and Dr. Rajender Reddy, ZPD, Zone-V, Hyderabad. Other presentation was of Dr. Surender Singh, Project Coordinator, AICRP on Farm Implements & Machinery, CIAE, Bhopal. The training coordinators and chairmen of 68 KVKs attended the session and benefited from the information from both the topics.

International Conference on Horticulture –2009 at Bangalore

The International Conference on Horticulture –2009 was held at Bangalore during November 9-12, 2009. This conference was organized by Dr. Prem Nath Agricultural Science Foundation (PNASF), Bangalore; Vegetable Science International Network (VEGINET), Bangalore; University of Agricultural Sciences (UAS), Bangalore. The Conference was designed to provide a common forum for all stakeholders to share their experience and expertise to suggest the technology-institution-policy package for sustainable production and marketing of horticultural products to augment employment-income generation to ensure livelihood security of the subsistence farmers without further depleting the natural resource base. Director CIPHET presented a lead paper on “Innovations in post harvest management techniques and equipment appropriate to production catchments in India” in the theme session on “Screening Technologies for Horticultural Development in Socio-Economic and Agro Climatic Perspectives”. Others papers presented in the session were –

2. Tamilnadu precision farming project: A prelude to next green revolution.- Dr. E. Vadivel.
3. Hightech interventions in horticulture for quality assurance to meet market demand. – Dr. G.S. Kahlon and Dr. A.K. Singh.
Brain Storming Session on “Post Harvest Technology of Horticultural Crops-Present Status and Future Action Plan

The second Brain Storming Session on “Post Harvest Technology of Horticultural Crops-Present Status and Future Action Plan” was held at IIVR, Varanasi during November 24-25, 2009. Dr. R.T. Patil, Director and Dr. R.K. Gupta, Head, Horticultural Crop Processing Division participated in Brain Storming Session. In this meeting the decisions taken in the last interaction meeting held at IIHR, Bangalore during August 23-24, 2008 were discussed and action plan was prepared based on the various post harvest activities going on and achievements made at different ICAR institutes.

The Brain Storming Session was divided in Technical Sessions followed by Inaugural and Plenary Session. On 24th November, Brain Storing Session was inaugurated by Dr. H.P. Singh DDG (Horticulture), ICAR, New Delhi. During the Technical Session I, review of status of technology development, transfer and future thrusts in PHT of fruit crops and research achievements of various Institutes were presented. The session was jointly conducted by Dr. R.T. Patil, Director, CIPHET, Ludhiana and Dr. S.K. Naskar, Director, CTCRI, Trivandrum.

On 25th November, 2009, Technical Session on Networking of Resources was held. The Session was jointly conducted by Dr. P. Chandra, Director, CIAE, Bhopal, Dr. R.T. Patil, Director, CIPHET, Ludhiana and Dr. S.K. Naskar, Director, CTCRI, Trivandrum. During this session, Dr. R.K. Gupta, Head, HCP, CIPHET presented the Network Project Proposal for Post Harvest Management and Value Addition of Horticultural Crops. The proposal was discussed in detail and the Researchable issues of each Cooperating Centre proposed were discussed and finalized. The proposal includes 16 Institutes to work in Network mode and activities will be coordinated jointly by CIPHET and IIHR, Bangalore under the overall guidance of Director, CIPHET. It was decided that till this network takes some formal shape all should interact and work in network mode with available resources so that need-based technologies are developed and repetition is avoided. This network will also help to work in consortium mode so that similar activities will be complimentary to each other in achieving the final results. It was also decided that the information on the capability of respective laboratories in analyzing the samples for food quality and safety should be compiled so that effective single window service can be provided jointly to the food processing entrepreneurs. The post harvest technology based entrepreneurs need hands on training on the whole package of technology and for this each institute should develop and conduct technology based EDP programmes similar to the approach followed by CIPHET. A discussion group ICARPHET@YAHOOGROUPS.COM has been formed on the Internet for the effective interaction and exchange of information among the members.

International Conference on “Nurturing Arid Zones for People and the Environment: Issues and Agenda for the 21st Century”

The International Conference on “Nurturing Arid Zones for People and the Environment: Issues and Agenda for the 21st Century” was held at Central Arid Zone Research Institute, Jodhpur. Director, CIPHET presented an invited lead paper on “Value Addition to Arid Zone’s Agri Produce for Sustainable Livelihood” in the session on “Sustainable food production and value addition of agri-products”. Dr. A.K. Srivastava, Director, NDRI, Karnal also presented a lead paper on Status of Dairy Industry in India. Other important presentations made in this session were as follows;

1. Developing Dairy Enterprises for the Upliftment of Rural Poor.
2. Rural Women Empowerment for Health and Nutrition in Bikaner District of Western Rajasthan.
3. Value Added Woven and Knitted Textiles from Ramie-a-natural Miracle Fibre.
4. Chemical Composition of *Prosopis juliflora* and *P. pallida* Pods and their Milling Products.
5. Extending Post Harvest Shelf Life of Fresh Fruits of Date Palm cv. *Barhee* by Antioxidant and Ethylene Absorbent.
6. Overcoming Malnutrition in Arid Land Areas.
8. Floral Characters of Non-bitter *Aloe* from Indian Arid Region.
9. Jute Based Paper Carry Bags and Particle Boards Using Gum Arabic as Binder.

**Special Training Programme on Post Harvest Management of Fruits and Vegetables**

The last batch for 10 days Special Training Programme on Post Harvest Management of Fruits and Vegetables for officials of the Directorate of Horticulture and Food Processing, Ranikhet, Uttarakhand was organized during November 04-13, 2009 at CIPHET, Abohar. Nine Horticulture Officials from various Districts of Uttarakhand (Government of Uttarakhand) participated in the training programme. The training included various lectures including Post harvest management of fruits and vegetables and their by products, Microbial spoilage of fruits and vegetables causing food poisoning, Drying and Dehydration of fruits and vegetables for value added products, Post harvest losses and its control in fruits and vegetables, Processing and value added product development of aonla, Minimal processing and packaging of leafy vegetables, EC concept and its benefit for enhancing shelf-life of fruits and vegetables, Processing of onion, ginger, garlic and concept of Agro-Processing Centre, Post harvest diseases and disorders of fruits and its control, Some novel product development form guava and other fruits, Minimal processing including arils extraction of pomegranate and storage life, Commercial cultivation and post harvest management of cut flowers, Essential oil and other ingredient extraction technology for aromatic plant and fruits waste, Scope of shrink packaging of fruits and vegetables, Processing and value addition of Vegetables, Loss reduction in vegetables adopting appropriate Post Harvest Management practices, etc. The training also included the practical classes on novel products preparation from guava and pomegranate. The participants were also exposed to different laboratories at CIPHET, Abohar as well as Ludhiana. Further, participants also visited Punjab Agro Juices Limited, Abohar, PAU Fruits Research Station, Abohar, Hi-tech Nursery, Mauzgarh and scientifically managed farmer’s orchards. The training was conducted by Dr. R. K. Gupta, HOD, HCP as Course Coordinator and Sh. V.K. Saharan, Technical officer as Co-Coordinator.

![Inauguration of Special Training Programme](image-url)
Entrepreneurship Development Programme on Aonla Processing

EDP on "Processing of aonla for manufacturing of value added products" was held during November 13-19, 2009 at HCP Division, CIPHET, Abohar. The EDP Coordinator Dr. R.K. Gupta and Co-Coordinator Er. R.K. Viswakaram conducted the above training. The trainees were given information about different processed products made from aonla and their process technology with the help of lectures and practical. The participants of EDP have developed different type of aonla products such as aonla preserve, candy, beverage, jelly, jam, leather etc.

Demonstration of Aonla Processed Products during EDP

Coordination Committee Meeting of All India Coordinated Research Project on Application of Plastic in Agriculture

The IX Coordination Committee meeting of AICRP on APA operating from CIPHET Ludhiana was organized at College of Technology and Engineering, MPUAT, Udaipur on 16-17 November 2009. The meeting was inaugurated by Dr. K. N. Nag, Ex-VC, Rajasthan Agricultural University, Bikaner as Chief Guest along with Dr. S.S. Chahal, Vice Chancellor, MPUAT, Udaipur as Chairman, Dr. M.M. Pandey, Dy. Director General (Engg.), ICAR, New Delhi as the Guest of Honour, Dr. S.K. Tandon, ADG(Engg.) as Co-Chairman, Dr. Pratap Singh, Director Research and Dr. V.K. Srivastava, Dean, CTAE, MPUAT, Udaipur by lighting lamp. With this, the new centre of AICRP on APA at CTAE, MPUAT, Udaipur was also inaugurated. Dr. Pratap Singh, Director of Research, MPUAT, Udaipur welcomed all the dignitaries, experts, scientists from centers and other participants. Dr. P.R. Bhatnagar, Project Coordinator presented “Introduction to AICRP and Proceedings of Workshop held at SKUAST, Srinagar” and outline of the programmes for the CCM. Dr. S.K. Tandon, ADG (Engg.) thanked Dr. S.S. Chahal, VC, MPUAT for agreeing and providing facilities to hold CCM at Udaipur. He expressed that plasticulture, especially polyhouses has to play a major role in mitigating the effect of global warming and climate change on horticultural production. Role of plastics in animal husbandry and fishery is also an important aspect to be dealt in the
project. Dr. M.M. Pandey, DDG (Engg.) expressed happiness to inaugurate new centre at Udaipur in the presence of Dr. P. Chandra and Dr. N.P.S. Sirohi, the stalwarts of the field, and asked PC and research engineers to get their contributions and revisit the projects which are to be discussed in the meeting to ensure all the major objectives and thrust areas, as identified by the QRT, are properly taken care of. All the projects should be developed into demand driven technologies which have direct application in the field. Linkages should be developed with other agencies working in the area and the AICRP may work for development of technologies. Dr. S.S. Chahal, VC, MPUAT expressed that the plastics have become very important input for the modern agriculture and contributed a lot in improving the production and quality of most agricultural and horticultural crops. Many plastics techniques have been adopted in India, but still, lot needs to be done compared to other countries, e.g. China. He emphasised the use of plastics in water distribution system, packaging of seed, fertilisers and other agricultural inputs, micro-irrigation, greenhouses. Dr. K. N. Nag, Ex-VC, RAU, in his inaugural address emphasized that the plastic has enormous opportunities in agriculture, but pertinent research needs to be undertaken at right time, otherwise we will be lagging behind. We need to strengthen our science and technology on such issues. He also called upon the need of inclusion of a course on plastics as a engineering material and its uses in agriculture which should be common to all the three branches of Agricultural Engineering. Dr. V.K. Srivastava, Dean, CTAE proposed the vote of thanks to all the dignitaries on the dais, delegates, participants, organizing committees and media. He also thanked ICAR for starting new centre of APA at MPUAT, Udaipur.

Modernizing Indian Meat industry through post-harvest engineering interventions

National Meat and Poultry Processing Board and Ministry of Food Processing Industry organized First National Conference on Meat and Poultry Processing in India during Nov 4-6, 2009 with a sole mandate to move forward the growth and further promotion of Meat and Poultry sector in the country. Dr. Suresh K Devatkal, Senior Scientist (Livestock Process Technology) delivered an invited presentation on “Modernizing Indian Meat industry through post-harvest engineering interventions” on 4th November, 09. The conference was attended by eminent researchers and industry persons and representatives from Ministry of Food Processing Industries. Dr. Devatkal’s presentation highlighted the CIPHET’S action plans to modernize small scale meat shops and develop entrepreneurship in meat processing.

In spite of big potential due to its large livestock population the meat industry in India has not progressed and got its due importance. Although India has acquired number one status in the world contributing around 15% of world’s milk production during 2007-08, the meat production, which vibes well with dairy, is very low. Meat production is around 2% of the world meat production. The processing status is one of the major key issues of concern in the meat sector of India. Quality and hygiene levels are very low along with tremendous waste of meat, contamination/deterioration of meat and also the avoidable cruelty to the animals. Among the meat sector, poultry meat is prominent in India. The organized sector of poultry industry is contributing nearly 70% of the total output and the rest 30% in the unorganized sector. The broiler industry is well dominated in southern states in our country with nearly 60-70% total output comes from these states. The layer industry is also represented more in southern states especially, Andhra Pradesh, Tamil Nadu and Maharashtra producing nearly 70% of the country’s egg production. India’s 75% of egg produce is consumed by the 25% population living in urban and semi-urban areas. Presently about 800 hatcheries are operating in the country.
Valedictory function of Winter School on “Recent Developments in Post-Harvest Processing and Value Addition to Livestock Produce”

Total of 21 participants from across the country took part in this first winter school on meat processing. Dr. Kondaiah, Director, NRC on Meat, Hyderabad was the chief guest on valedictory day. He emphasized the need for development of indigenous processing and packaging methods and standards to suit the local needs. Dr. R. T. Patil Director, CIPHET informed that a lot needs to be done in development of processing of meat and its packaging in India. He said that the availability of good quality processed meat and their product in the developed world is a major factor. He further told that India has a lot of potential on the front as the country has a large number of varieties of meat than any western country.
भारतीय संग्रहीत ग्रामीण उन्नयन में
कृषि प्रसंस्करण उद्योग को भूमिका
33-14 नवम्बर 2009

推迟了的场合

जा. आर. टी पाटिल, निदेशक सीफेस ने कार्यक्रम को आगे बढ़ाते हुए इसी कड़ी में कहा कि खाद्य उद्योग ग्रामीण क्षेत्रों के विकास के लिए एक महत्वपूर्ण भूमिका निभा सकता है। आज हमारे लिए हिंदी संग्रहीत एक खुदी का अनूठा अवसर है जहां पर हमारे वैज्ञानिक अपने–अपने अनुभु रखेंगे।

जा. एस. के. नन्दा, परियोजना समावेशक ने कहा कि किसानों की आय नाना प्रकार से बढ़ी है जब वे स्वयं खाद्य प्रसंस्करण करते हैं तो प्रोड्योगिकी की छोटे स्तर पर खाद्य प्रसंस्करण के लिए विकसित होनी चाहिए। दूसरे दिन जा. आर. टी पाटिल, निदेशक महावेद ने संग्रहीत निदेशक में कहा कि ग्रामीण और शहरी स्तर पर जो आय का अन्तर है वह तभी कम हो सकता है जब हमारे वैज्ञानिक गण विकसित प्रोड्योगिकी को गांव तक पहुँच सके तो कि वहाँ पर कृषि प्रसंस्करण पर उद्योग प्रकाशित हो सके। उद्यमिता कार्यक्रम ग्रामीण क्षेत्रों में ज्यादा होने चाहिए। उन्होंने सलाह दी कि राज्य सरकार के कृषि विभाग को दूसरे राज्यों की तरह यह अधिकार होना चाहिए कि अन्य उद्यमिता विभाग की अप्रासार कृषि उद्यमिता का हस्तांतरण ज्यादा हो सके। इसी कड़ी को आगे बढ़ाते हुए कहा कि किसानों के लिए कृषि प्रसंस्करण की विभिन्न सुविधाएं उनके संस्थान पर उपलब्ध हैं।

इस अवसर पर विभिन्न सिंह, किसान ग्राम देश गठन ने सोयाबीन प्लांट से विभिन्न उत्पादों के उत्पादन करने के लिए अपना अनुभव बताया। इन्जीनियर ए. के. सिंह प्रबंध संचालक (अभियांत्रिक) ने सलाह दी कि वैज्ञानिक गणों को बुनियादी स्तर पर किसानों की मदद करनी चाहिए।

जा. के. नरसिंग, आयोजक सचिव ने समारोह समापन पर सभी प्रतिभागियों को संग्रहीत में भाग लेने व सफल बनाने के लिए धन्यवाद किया।
Two day National Hindi Seminar on Role of Food processing in rural empowerment at CIPHET, Ludhiana

Two-day national hindi seminar on role of food processing in rural empowerment was concluded on 14/11/09 at Central Institute of Post Harvest Engineering and Technology Ludhiana campus. Delegates from across the country participated in the seminar. Total of five sessions on technologies for processing food/meat, fruit and vegetables processing, packaging, storage, transfer of technology to masses were organized. The emphasis was given that technologies should be developed to help people in rural areas. On the occasion, Bachittar Singh, farmer from village Deh Kalan in Sangrur district, shared his experience of successfully establishing Soya bean plant for producing various products. He advised entrepreneurs to maintain quality of their products. Er. A.K Singh, Managing Director (Engg.) of National Seeds Cooperation (NSC) suggested that coordination bodies should be formed at ground level to help farmers.

National Conference on Virtual and Intelligent Instrumentation

The National Conference on Virtual and Intelligent Instrumentation (NCVII-09) was organized at Birla Institute of Technology & Science, Pilani during 13-14 November 2009. The Director CIPHET was invited to present a talk on “Application of Image Processing Technology in Post Harvest Management of Crop Commodities” in session on Image Processing and Virtual Instrumentation. Dr. Devinder Dhingra, Senior Scientist attended this conference and represented CIPHET. During the conference he interacted with Mr Jayaram Pillai, M.D. for India, Russia and Arabia, National Instruments, Mr. Ganesh Devaraj, MD and CEO Soliton Technologies, Mr Bhaskar Ceri, MD and CEO, Apna Technologies as they are working in the area of image processing and related aspects. He also interacted with Dr A K Kohli, Chief Executive, Board of Radiation and Isotope Technology, GOI, Dept of Atomic Energy, Navi Mumbai regarding procurement of Pilot Plant on Food Irradiation. The address by Chief Guest Mr Avinash Chander, FNAE, Director ASL, DRDO, Program Director AGNI, keynote addresses by Mr Jayaram Pillai on Algorithm Engineering, plenary talks on Advances in Machine Vision Technology and Applications, Evolution and future trends of virtual instrumentation were informative. Dr. Dhingra also acted as a member to judge the poster sessions on 13 and 14 November 2009.

One week training on ‘Post-Harvest Technology for Rural Catchments’

A batch of twenty participants sponsored by ATMA Taran Taran Punjab attended training program on ‘Post-Harvest Technology for Rural Catchments’ at CIPHET, Ludhiana during 23-27 November’ 2009. Dr. Sangeeta Chopra, Senior Scientist coordinated the training programme. The participants were farmers from the villages in the district of Taran Taran and are engaged in growing wheat, paddy, mushrooms, peas and potatoes. The training was given on processing of grains, pulses, oilseeds, fruits and vegetables including processing of soybean, aonla and guava through lectures and practicals. The know-how on minimal processing, packaging, storage of vegetables and cultivation of mushroom and vegetables was also disseminated.
Model Training Course on ‘Establishment of Agro Processing Center in rural catchments for processing and value addition activities’

A one week training on ‘Establishment of Agro Processing Center in Rural Catchments for Processing and Value Addition activities’ was inaugurated on 30th November 2009 for the District Superintending Agricultural Officer, Deputy Director Agriculture and Agricultural Development Officers of various State Departments including Maharashtra, Punjab and Nagaland.
CIPHET participated in India International Trade Fair 2009 held at New Delhi during November 14 to 27, 2009. CIPHET showcased its various Agro processing technologies to visitors. The CIPHET stalls got huge response from visitors and visitors were particularly interested in Maize Cob Sheller and Banana Comb Cutter. The young visitors were shown keen interest in Entrepreneurship Development Programme (EDP) run by the institute. They were apprised about the EDP to be conducted in 2010 and its importance for self-employment in Agro-processing sector.

CIPHET scientists attend Management Development Programme at IIM, Lucknow

Dr. D.R.Rai CPI and Dr. Sangeeta Chopra Co-CPI of the NAIP sub-project ‘Mobilizing Mass Media Support for Sharing Agro-Information’ participated in a Management Development Programme on ‘Technical aspects of Agricultural Communication and Knowledge Management for ICAR Executives’ held at IIM, Lucknow during November 16-20, 2009. The programme laid emphasis on communication in knowledge driven context, knowledge discovery process in agriculture, corporate communication and image building, electronic mass media and agriculture, introducing agricultural communication, strategic communication for agriculture experts, media management for agricultural scientists, print tools and content creation and construction for agriculture, writing press release : hands on experience, agriculture research communication through electronic media, tools and techniques of agriculture communication, information communication technology in agriculture, effective documentation, information dissemination, role of information in farmer’s adoption of new technology. The insight into the techniques of interacting with the media and their working (priorities and constraints) was also given.
CIPHET Scientists with co-participants of management development program

Director Dr. R. T. Patil and Administrative Officer Sh. Tej Ram accepting the award for CIPHET’s contribution in promotion of National Language Hindi
Technology of the Month

CIPHET Developed Novel Design of Low Cost Tray Dryer

The dryer is one of the most essential equipment required in food processing as most of the fruits and vegetables and crop commodities require drying for preservation as well as for processing. The CIPHET has developed a tray dryer having a unique design of plenum chamber which facilitates horizontal as well as vertical hot air movement. This concept has minimized the problem of non-uniform drying of food materials in different trays in the tray dryer. The overall dimension of the dryer is 2700 mm x 600 mm x 2300 mm (L x W x H). Drying chamber has 925 mm x 600 mm x 1120 mm outside and 760 mm x 570 mm x 1020 mm inside dimensions. Inside drying chamber has racks to hold 14 trays having dimension of 750 mm x 550 mm x 25 mm. Total surface area of tray is 5.775 m² which is sufficient to load about 30 kg of fresh sliced fruits and vegetables for drying in thin layer. Trays are made up of aluminum frame to hold the heat resistant nylon mesh, which help to ease pass of moisture carrying wet air from the food product and faster drying rate.

Dryer consists of microchip processor based heat controller system for switching on/off the 1 KW capacity 8 numbers of heaters as soon as heat sensor response is received by micro-processor. This system has heat sensor, control relays, current and set temperature display unit, number of heater on-off indictor by light display, temperature increasing, decreasing and set buttons helps to maintain uniform heat in the drying chamber. Heated air from heating chamber to drying chamber is carried and circulated by different split section with help of 1 hp motor operated blower at 2800 rpm. Blower outlet and heating chamber inlet (diameter 10 cm) were connected before heating elements. Due to air movement through different section helps to dry the product uniformly in all the 14 trays. This equipment can be useful in drying vegetables for soup making, fruit pulp for making fruit leather, drying of spices and condiments to achieve better quality. The design of the dryer is ready for transfer for its manufacturing on commercial scale. The capacity of the dryer is about 30 kg of sliced fruits/vegetables per batch.
Publication of the Month

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