



Central Institute of Post Harvest Engineering & Technology Ludhiana

OUR SLOGAN: PRODUCE, PROCESS AND PROSPER

**CIPHET E – Newsletter for November 2010
Vol. 5 No. 11**

Director's Column



Dear All

During the month important events on horticulture crops were attended. The post harvest technologies developed and commercialized by CIPHET for horticultural crops were highlighted. The interaction meeting on Horticulture at IIHR, Bangalore and Indian Horticulture Congress 2010 provided us a platform to depict the work done and also show our strength in the area of post harvest engineering for horticultural crops. These events would definitely bring collaborations with commodity institutes. The participation in APAARI Expert Consultation on Post Harvest & Value Addition of Horticultural Produce was an eye opener and an exchange of ideas with the member countries in the Asia-Pacific region was quite fruitful. A network group with this objective has been started as asiapacificphet@googlegroups.com. Sh Bijay Kumar, MD, National Horticultural Board visited CIPHET to explore possibilities of collaboration in promoting production, post harvest management and processing of horticultural crops.

Dr. P.R. Bhatnagar, PC (APA) visited NARC, Kathmandu, Nepal for interactions on 'Plastic houses for off season vegetable cultivation' Dr. Bhatnagar along with scientists from IIHR, IVRI and DCFR, Bhimtal visited various sites located in Bhaktapur, Kathmandu and Lalitpur. Dr. Moustafa Saleh Emam, Chairman of Vegetable Handling Research Department, Agricultural Research Horticultural Institute, Gizo, Egypt attended a training on post harvest technology at CIPHET.

NABARD conducted one day workshop on New Investment Opportunities in Farm and Non Farm Sector at CIPHET Ludhiana and Abohar for representatives of financial institutions, technocrats and progressive farmers. The objective of the workshops was to create awareness about various schemes initiated and promoted by NABARD for increasing self-employment in farm and non-farm sector.

The scientists from CIPHET attended a workshop on 'Integrated Bio-processing and Bio-Products Technologies for Sustainable Food Security' at National Agri-Food Biotechnology Institute Mohali. The institute signed an MOU with National Meat and Poultry Processing Board to provide technical consultancy to the Board on various aspects of meat industry. CIPHET stall put up during Agri Expro- Haritkranti - 2010 at Baramati, Maharashtra attracted heavy crowd of farmers. Similarly our stall witnessed a huge turnout of visitors in the India International Trade Fair (IITF) 2010 at Pragati Maidan, New Delhi. Progressive farmers sponsored by KVK, Hoshiarpur visited the institute to obtain first hand information on post harvest technologies. In this issue we are including a simple and farmer friendly technology for storage of ginger. On behalf of CIPHET family, I wish all of you a very Happy and Prosperous New Year 2011.

With best regards

**R.T. Patil
Director**

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Interaction Meeting on Horticulture

The Interaction Meeting on Horticulture was held at Indian Institute of Horticultural Research, Bangalore (Karnataka) on 10th-11th November, 2010. It was a review meeting conducted by DG, ICAR to review the research programmes of horticultural institutes, AICRPs and Network Projects to prioritize the areas of work and strengthening of the activities by collaborating with more than one institute. The special invitees were Director, CIPHET; Dr. Pitam Chandra, Director, CIAE, Bhopal; Dr. Kailash Chander Bansal, Director NBPGR; Dr. O.M Bambawale, Director NCIPM, New Delhi. Director CIPHET gave an overview of post harvest research conducted by CIPHET and AICRPs centre's along with the collaborative projects of CIPHET with NRC on Seeds Spices, NRC on Makhana and interaction we maintain with NRC on Pomegranate; Grapes; Onion and Garlic. The approach of CIPHET was appreciated by the Hon'ble DG and all participants in promoting post harvest research and for collaborative works, it was stressed upon that institutes which want to get help from CIPHET should show stronger commitment by identifying the scientists and signing joint RPF.

Indian Horticulture Congress 2010

The 4th Indian Horticulture Congress 2010 was held at New Delhi from 18th to 21st November 2010. Dr. R T Patil and Dr. Ramesh Kumar attended this meeting. Dr. Patil contributed an invited talk on "Advances in Mechanization of Post Harvest Management of Horticultural Crops". The three Congresses were held at New Delhi, Shillong and Bhubaneswar, during 2004, 2007 and 2008. For the 4th Indian Horticulture Congress, 2010 papers were in following 16 broad areas as follows:

1. Climate change and mitigation measures;
2. Biodiversity management;
3. Innovative production technologies I;
4. Innovative production technologies II;
5. Mechanization in Horticulture.
6. Marketing Initiatives, Organized Retailing, Aggregation Models and Value Chain
7. Post Harvest Management And Value Addition
8. Fruits and Vegetables in Health and Nutrition
9. Skill Development in Horticulture
10. Emerging Standards in Horticulture
11. Horti Inputs
12. Livelihood Opportunities in Horticulture
13. Pane Discussion on Infrastructure Development in Horticulture Sector: Availability and Future Needs
14. Policy Initiatives for Integrated Horticulture Development
15. New Initiatives in Technology Transfer and Adoption
16. Financing Horti-Business

The Congress has generated meaningful discussions culminating in more relevant recommendations, which were passed to different agencies for consideration in framing policies and programmes for future R&D activities in horticulture.

Integrated Bioprocessing & Bio-products Technologies for Sustainable Food Security

The ISTP, CANADA & DBT, INDIA jointly organized a workshop on “Integrated Bioprocessing & Bioproducts Technologies for Sustainable Food Security” at National Agri-Food Biotechnology Institute, Mohali on 24th November, 2010. The Canadian Govt. and especially University of Saskatchewan and its constituent agencies like innovation park, Institute of PBT and POS pilot plant would like to collaborative with DBT and other institution working on post harvest processing and value addition. In this context CIPHET scientists were invited to present overview of work in different niche areas such as fermentation, biosensor, encapsulation and smart packaging. Director, Dr. R.T Patil delivered a talk on the showcase of technologies developed by CIPHET and also highlighted about research initiatives being taken by scientists in Food Biotechnology and Bioprocessing. Dr. S.N Jha delivered a lecture on Non-destructive approaches for quality determination in fresh and processed foods. Dr. K. Narsaiah delivered a lecture on “Micro and Nano encapsulation of probiotics, Enzymes and Bacteriocins” and Dr. H.S. Oberoi delivered a lecture on “Utilization of crop residues and by products”.

Meeting was attended by following delegates and was inaugurated by Canadian High Commissioner to India in Chandigarh.

1. Dr R Harsh (RF processing of agri-produce), SAMEER, Mumbai
2. Dr Alagusundaram (Crop processing & analytical capabilities), Director, Indian Institute of Crop Processing Technology (IICPT), Ministry of Food Processing Industries, Government of India, Thanjavur
3. Dr Pawan Kapur (Sensors & Energy Interventions), Director, CSIO, Chandigarh

4. Dr U S Shivhare (Food Processing Applications), Punjab University, Chandigarh
5. Dr H N Mishra, Professor, Agricultural & Food Engineering, IIT, Kharagpur
6. Dr Narpinder Singh, Guru Nanak Dev University, Amritsar
7. Dr Martin Reaney, College of Agril & Bioresources, University of Saskatchewan, Canada
8. Dr R Ezekiel, Central Potato Research Institute, Shimla.
9. Dr Pradyuman Kumar, Department of Food Engineering and Technology, Sant Longowal Institute of Engineering and Technology, Sangrur
10. Dr K S Minhas, Professor & Head, Department of Food Science & Technology, Punjab Agricultural University, Ludhiana
11. Dr Rakesh Kapoor, Director, Science and Technology, Bioriginal Food & Science Corp., Saskatoon
12. Mr I K Sardana, Sukhjit Starch & Chemicals Ltd., Sukhjit Road, Phagwara
13. Mr Ashok Bharati, VP, Jagatjit Industry
14. Mr R P S Dhaliwal, Field Fresh Foods (Bharti/DelMonte)
15. Sh. Jagmohan Singh, MD, B N Flour Mills, Batala

APAARI Expert Consultation on Post Harvest & Value Addition of Horticultural Produce

APAARI Expert Consultation Meeting on “Post Harvest & Value Addition of Horticultural Produce” jointly organized by APAARI and MARDI and cosponsored by FAO, GFAR, Hort CRSP and MAFC was held at Putrajaya, Malaysia during 29.11.2010 to 02.12.2010. Dr. R. T. Patil was invited by the organizer MARDI Malaysia based on the appreciable work being done at CIPHET in this important area. He made a presentation on



“Simple, reliable and cost effective post harvest machineries for horticultural produce” and explained processing machines and protocols for value addition in production catchment. It generated lot of interest and as follow-up for future interaction I have been asked to start network group which has been started as “asiapacificphet@googlegroups.com”.



Asia-Pacific Association of Agricultural Research Institutions (APAARI), established in 1990 at the initiative of FAO, is an apolitical, neutral, non-profit forum of Agricultural Research Institutions, National Agricultural Research Systems (NARS) in the Asia-Pacific region, in the pursuit of common objectives. Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) and Asia-Pacific Agricultural Research

Information System (APARIS) are its two main programmes. APAARI has a membership of 51 institutions including NARS, CG Centres and other regional organizations.

The 'Mission' of APAARI is to promote the development of national agricultural research systems in the Asia-Pacific region through facilitation of intra-regional, inter-institutional, and international cooperation/partnership.

The overall objectives of APAARI are to foster agricultural research for development in the Asia-Pacific region so as to help address the concerns of hunger, poverty, environmental degradation and sustainability of agricultural production. More specifically, the objectives are as follows:

- Promote the exchange of scientific and technical know-how and information in agriculture.
- Encourage the establishment of appropriate co-operative research and training programmes in accordance with identified regional, bilateral or national needs and priorities.
- Assist in prioritizing NARS/regional needs, strengthening of research organizational and management capabilities of member institutions including information and communication technology.
- Strengthen cross-linkages among national, regional and international research centres and organizations, including universities, through involvement in jointly planned research and training programmes; and
- Promote collaborative research among member institutions, including need based support to regional research networks.



The following are the major institutions that are members of this association whose HQ is at Bangkok.

- ACIAR – Australian Centre for International Agricultural Research (Australia)
- AREEO – Agricultural Research, Education and Extension Organization (Iran)
- BAR – Bureau of Agricultural Research (Philippines)
- BARC – Bangladesh Agricultural Research Council (Bangladesh)
- CARP – Sri Lanka Council for Agricultural Research Policy (Sri Lanka)
- COA – Council of Agriculture (Chinese Taipei)
- CoRRB – Council of RNR Research of Bhutan (Bhutan)
- DOA – Department of Agriculture (Thailand)
- IAC – Institut Agronomique neo-Caledonien (New Caledonia)
- ICAR – Indian Council of Agricultural Research (India)
- JIRCAS - Japan International Research Center for Agricultural Sciences (Japan)
- MAFF – Koronivia Research Station, Ministry of Agriculture, Fisheries and Forest (Fiji)
- MPI - Ministry of Primary Industries, Department of Agriculture, Raiwaqa, Suva (Fiji Islands)
- MARD – Ministry of Agriculture and Rural Development (Vietnam)
- MARDI – Malaysian Agricultural Research and Development Institute (Malaysia)

The group on Plastic houses visited several locations in districts of Bhaktpur, Kathmandu and Lalitpur, and observed off-season vegetable cultivation in farmer's field. The off-season cultivation means production of vegetable during rainy season, as it was difficult to grow vegetable outside due to heavy showers and disease infestation. Farmers have erected rainshetlers using bamboo frame which is very cheap (Nepali Rs 90-100/m²). They could get very handsome remuneration from the structures as vegetables in the market which are very costly at that time. Few farmers were using black polythene covered plastic houses for mushroom cultivation.



Plastic houses constructed in farmer's field and cultivation of tomato as off-season vegetable

Dr. Bhatnagar interacted with Dr Shrimata Shtresh of Engineering Division, who explained about design of the polyhouses. They are mainly concentrating for rain shelter type only with varying shapes and bamboo framing depending on locations (Tarai, mid-hills and higher hills) and climatic conditions. However, they were not interested in raising winter vegetables as they told, it is abundantly available from Tarai or nearby areas (including India).



Group photograph of visiting scientists and Director, Planning and Co-ordination and other scientists of NARC

Dr. Bhatnagar also made a presentation regarding his experiences as Project Coordinator of AICRP on "Application of Plastics in Agriculture" and advised few tips to improve their cultivation using plasticulture techniques including plastic mulch and rainwater harvesting. Rainwater harvesting is very much required as the progress of agricultural development is hampered due to lack of water especially in upland areas and this part is very weak for NARC.

CIPHET signed MoU with National Meat & Poultry Processing Board

CIPHET signed MoU with National Meat & Poultry Processing Board on November 3, 2010. The MoU was signed by Director Dr. R.T. Patil for CIPHET and Rohit Mathur, CEO of NMPPB (National Meat & Poultry Processing Board) for MoFPI in presence of Subhodh Kant Sahay, Honorable Minister of Food Processing Industries, Govt of India and Ashok Sinha, Secretary, MoFPI (Minister of Food Processing Industries). The National Meat & Poultry Processing Board has



Exchange of MoU between CIPHET and NMPPB at New Delhi

been setup by Government of India to give a boost to the development of the meat and poultry processing sector in the country and production of healthy and hygienic meat for domestic consumption. As per MoU CIPHET shall provide technical consultancy to the Board on all aspects of meat industry and offer specialized training and other capacity building programmes based on CIPHET technologies. The functions of signing MoU were on the

Comb Cutter, an effective device to separate bananas, was also on the display. Recently, standardized technology of ready-to-eat blended meat products, which could be produced by using vegetables and meat products, was also explained to farmers.

CIPHET Scientists Interact with Progressive Farmers

A total of eight progressive farmers sponsored by Krishi Vigyan Kendra (KVK's), Hoshiarpur on November 16 visited Central Institute of Post Harvest Engineering and Technology (CIPHET) to get first hand information about activities and process/product development initiated by the institute in area of food processing. The visit was a part of training course on "Processing of Agricultural Produce at Rural level" organized by College of Agricultural Engineering and Technology of Punjab Agricultural University.



During the visit, the farmers were taken to different facilities of the institute and were made aware about recent achievements and novel technologies developed by the institute. Senior Scientist Dr. Dilip Jain, coordinated the visit of farmers and informed them about mandate of institute in the development of post harvest technologies. The visit was organized on request of Dr P.P.S Lubana, Dean College of Agricultural Engineering and Technology, PAU, to provide more exposure to farmers in the emerging field of food processing. A film on CIPHET was also screened for the farmers.



One-day NABARD Workshop on Investment Opportunities

GDP in agriculture must grow for balanced growth of country. If GDP growth remains lower than four per cent in agriculture, there would not be balanced growth in our country even as overall GDP growth rate remains as high as 11-12 per cent. These remarks were made by Dr R.T Patil, Director, Central Institute of Post Harvest Engineering and Technology, on inaugural session of National Bank for Agriculture and Rural Development (NABARD) sponsored one-day workshop on "Investment opportunities for farm and non-farm sector".



CIPHET Director Dr R.T Patil addressing during one day NABARD sponsored workshop on investment in farm and non-farm sector

The objective of the workshop was to create awareness about various schemes initiated by NABARD for increasing self-employment in farm and non farm sectors and getting

feedback for ongoing schemes. Representatives from NGOs, banks officials and chartered accountants took part in the workshop.

Saying that agriculture is largest source for creating employment, Dr R.T Patil, said that there is urgent need to increase GDP growth rate of agriculture. "If we fail to do so, lot of people from rural areas would start migrating to cities, leading to chaos and overburden on resources," he added. "We are a rich country but inhabited by poor people, not realising our potential. Having just 2.4 per cent of world's land, we support more than 15 per cent of world's population and 17 per cent animals," he said, adding that this was made possible as India is blessed with vast resources and presence of all climatic conditions for growth of crops.

Advocating for setting up of food processing industry in rural catchment areas only, Dr Patil, said that presently cities were facing problem of pollution and garbage due to process waste and crop residues from food processing industry. "If these were located in villages, waste products of fruits and vegetables could be utilized for animal feed as well as for manure in agriculture." Emphasizing that there is need to create awareness regarding benefits of indigenous foods, he showed his concern over increasing intake of unhealthy junk food especially by youth, under strong influence of advertisements. "Our indigenous food is far more nutritious and healthy." Floating idea of setting up of post harvest farmers club in rural areas, he urged local entrepreneurs to maintain cleanliness and integrity in production to win trust of customers.

From NABARD, Deputy General Manager, Regional Office, Chandigarh, A.K Pasricha, stressed the need to make villages self dependent as they used to be before British era. "Before Britishers came, villagers used to produce all things and only salt and kerosene was bought from cities," he added. Showing concern over growing infertility of Punjab's land due to excessive use of fertilizers, he said that states like Rajasthan were leaving Punjab behind and selling their dairy products in metro cities besides unfavorable conditions. He added that Punjab had lot of entrepreneurial spirit to grow in agro-industry as well.

CIPHET Stall Attracted Visitors at IITF 2010

The stall of the Central Institute of Post Harvest Engineering and Technology (CIPHET), Ludhiana, is witnessing a huge turn out of visitors in the India International Trade Fair (IITF) 2010 at Pragati Maidan, New Delhi, in response to food processing technologies especially ready to eat vegetable blended meat products developed by the institute.

"This time, a lot of visitors showed interest in ready-to-eat vegetable blended meat products, the processing technology recently developed by the CIPHET," said, Pradeep Kumar "Not only people from rural and scientific background, but people from urban background are also visiting in substantial number to see technologies developed by the Indian Council of Agricultural Research (ICAR)", said Technical Officer Sh. M.P Singh.

Notably, CIPHET has recently standardized the technology of ready-to-eat blended meat products, which could be produced by using vegetables and meat products. This will not only help in cost reduction, but would provide low fat alternative to consumers.

CIPHET is also displaying both Pomegranate Aril Extractor i.e. hand held and mechanically operated. While hand held extractor is useful for separating pomegranate at small scale, mechanical extractor is useful for extracting arils at commercial scale. Any size and variety

of pomegranate could be processed with extraction capacity of 90 to 94 percent. Mechanical damage to arils is reported as less as 3 to 4 percent during processing Similarly, Banana Comb Cutter was also on the display. This is simple but effective device to separate bananas. CIPHET trained entrepreneurs Mr. Garcha and Mr. Kailash Chowdhary also displayed their products in the trade fair which was an inspiration to those interested in starting food processing ventures.



Visitors showing keen interest at CIPHET stall at IITF in Delhi



Visitors showing keen interest at CIPHET stall at IITF in Delhi



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Indian Post Harvest Technologies Can Help Egyptian Farmers

“Agriculture in Egypt is still not highly mechanized. Indian post harvest technologies can help lot to farmers of Egypt”. This was revealed by Dr Moustafa Saleh Emam, Chairman of Vegetable Handling Research Department, Agricultural Research Horticultural Institute, Gizo, Egypt, who was here on training programme on post harvest at Central Institute of Post Harvest Engineering and Technology (CIPHET).

Having very less sources of irrigation, Dr Moustafa said that presently less than four million acres of area in Egypt was under irrigation. “Most of the country is under desert and still ancient river Nile is major source of irrigation for fields,” he said, adding that due to very small landholdings large scale mechanization of agriculture is not possible. “Potato, cotton, rice, maize, garlic, green beans, strawberry, wheat, cotton were our major crops. But, very less fruits and vegetables are processed and most of them are consumed as fresh. We are trying to increase their processing and seeking Indian expertise in that,” he added. Dr Moustafa said that he was quite impressed with research work on non-destructive methods to evaluate quality of fruits and vegetables, drying methods for fruits and vegetables and work on modified atmosphere packaging at CIPHET. “These technologies can help to increase income level of our farmers,” he added.

NHB MD visits CIPHET to Explore Possibilities of Collaboration

A delegation led by Managing Director of National Horticulture Board (NHB) Sh. Bijay Kumar visited Central Institute of Post Harvest Engineering and Technology, to explore possibilities of collaboration and get first hand information regarding research activities initiated by the CIPHET.

On the occasion, Director CIPHET, Dr R. T Patil and Managing Director, Sh. Bijay Kumar carried out detailed discussions on common areas of interest and steps to improve lives of

farmers through post harvest management, handling, better storage and value addition. Seeing good amount of work done in Post Harvest Management of horticultural produce, he specifically emphasized on the promotion and mass production of the equipments developed for this sector by the institute. Dr. R.K. Gupta, Head, HCP also explained the equipment developed for harvesting and value addition of underutilized fruits such as Jamun, Ber and Aonla.

It was discussed that NHB may fund for multiplications and adaptive trials by farmers as well as entrepreneurs for equipment developed by CIPHET, which included Pomegranate Aril Extractor, Fruits Harvester and Ber Destoner. "CIPHET may be involved in contract/consultancy research by NHB funding namely modification of railway containers for transportation and handling of fresh fruits and vegetables. Storage and handling



NHB Managing Director Bijay Kumar exploring possibilities of collaboration with CIPHET Director Dr R.T Patil

facility development at international borders (Wagah Border at Amritsar) for export of quality horticultural produce and selection of appropriate packaging and cushioning material for distance transportation of horticultural produce," Dr Patil, said, while revealing about various areas of collaboration on forefront during discussions. NHB MD Sh. Bijay Kumar, also indicated on possibility of funding Entrepreneurship Development Programmes for farmers as well as young entrepreneurs pertaining to PHM and value added product manufacturing from fruits and vegetables at CIPHET.

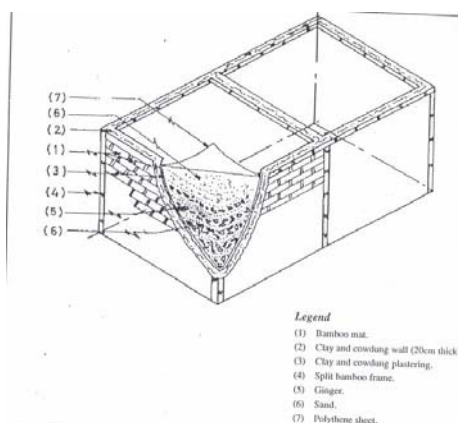
Transfer

Dr. V. K. Bhargav, Scientist (SS) (FMP) has been transferred from CIPHET, Ludhiana to CIAE, Bhopal on public interest and relieved in the afternoon of 27-11-2010.

Technology of the Month

GINGER STORAGE: Low Cost Clay-Bamboo Wall Ginger Storage Structure

Ginger is sown in NEH region during April & May. Crop matures in 8-9 months and harvesting is done during December and January. During this period the farmers do not get remunerative price. Farmers prefer to store the ginger and its propagative material. Storage is essential for next cultivation. As a traditional practice farmers do not dig out the rhizomes and leave them in the field. This is not very good method. The other method practiced by farmers is to dig a pit in the field and store rhizomes in it. Again, the losses due to rotting and sprouting are to the tune of 30-40 %. In order to solve the problem of storage of ginger a low cost storage structure was developed using clay, bamboo and other locally available raw materials. The schematic and skeleton of the clayed-bamboo wall ginger storage structure is presented in figures. The structure has two chambers of size 2 m x 2 m x 1.4 m (height). The walls of the structure were made of bamboo mat, clay and cowdung. The thickness of the wall is 20 cm; it is double walled with its frame made of bamboo & GI wire. The clay and cowdung paste was poured in the gap of the wall in 4-5 stages at regular intervals. The outer surfaces of the walls were plastered with clay and cowdung paste. After drying the structure is ready for storage of ginger.



Schematic of Clay-bamboo Wall Ginger Storage Structure



Double Wall Bamboo Structure

The ginger was stored in this chamber by alternate layer of dry sand and rhizomes with keeping the thickness ratio of 2.5: 10 cm. The lower and upper layer of sand was kept around 8 cm thick. The top of the chamber was covered with the polythene sheet and sealed from the edges by putting more pressure with the help of split bamboo.

Ginger was kept for five months in such structure. It was observed that there was (a) no loss in weight and moisture, (b) no sprouting took place, (c) no loss due to any infestation and rotting and (d) the quality of rhizomes was also maintained. The structure proved perfect for storing the rhizomes till the period of further sowing. The capacity of the storage in such structure was approximately 4 tonnes of rhizomes. The unit capacity of the structure was evaluated as 350 to 400 kg per cubic meter of space.

Publication of the month

ProduceProcessProsper

CIPHET NEWS

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From The Director's Desk....



The third quarter of year 2010 saw many research achievements like *makhana* processing, extraction of dietary fibre from potato peel, sausage filler, development of starch based coating for extending shelf life of mango and guava and mixed fruit Ber leather. A winter school on 'Novel techniques in food processing, co-product utilization and quality assurance' was also organised at CIPHET from September 1-21, 2010. Training programs were organised on processing and value addition of groundnut and soybean, post harvest technology for rural catchments for the farmers from Assam and Punjab and on extrusion technology for Ludhiana central jail prisoners. An awareness camp was held for rural women on food processing at CIPHET, Abohar. The TOT division also coordinated preparation of a documentary film on post harvest technologies of CIPHET as part of initiative taken by National Film Development Corporation. The institute organized its 18th Institute Research Council meeting and the key achievements were presented along with progress of research work. The technologies on processing of groundnut/soymilk into milk and paneer, green chilli powder, dehydration of onion, garlic and ginger were licensed to entrepreneurs during this period. A number of research papers were published and active participation in conferences, exhibition and other related programmes was taken up. During this period, three new faces Ms. Monika Sharma, Ms. Indu Karki and Dr. Anurag have joined the institute. I welcome them to the family of CIPHET. Also, Dr. Deepak Raj Rai was selected as Head (Transfer of Technology Division). The help rendered by all scientific, administrative, technical and supporting staff in institute activities is highly acknowledged.

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