

Central Institute of Post Harvest Engineering and Technology, Ludhiana

Our Slogan: Produce, Process and Prosper

CIPHET E – Newsletter for March, 2008
Vol. 3 No. 3

Director's Column



Dear All,

The human beings have very indiscriminately played against the nature in terms of deforestation, constructing huge dams responsible for drastic changes in ecological systems. As a result today we are facing the problem of global warming and overall unpredictable climate change. Similar to plants the performance and growth of the animals also depends on the environmental conditions. These environmental conditions inside the structure affect the animals' heat and moisture productions and ultimately their comfort. Though we cannot immediately undo the damage done and bring in the favorable climate, we can create a favorable weather condition by using the controls and proper design of structures. The precision agriculture under protected environment and controlled atmosphere in animal houses can enhance the productivity and product quality. It has been reported that under heat stress the milk yield of dairy cattle gets reduced by 3-20 % and conception rate can go as low as 0 % in extreme cases (Wagner, 2001). Samia Al-Marsafawy, Professor of Agrometeorology and Climate Change Studies at Soil, Water and Environment Research Institute, Egypt has predicted for Egypt that wheat grain yields will be reduced by nine per cent if temperature increases by two degrees centigrade and by 19 per cent with a four degrees increase. Maize and sorghum grain yields will be reduced by 23 per cent and water needs will rise by eight per cent by 2050. Similarly rice crops will be reduced by 11 per cent and water needs will be increased by 16 per cent. Tomato yields will be reduced by 14 per cent if temperatures increase by 1.5 degrees centigrade and by 50 per cent with a 3.5 degrees increase. This is the data for Egypt but for India also climate change will be affecting equally badly. Indian study indicates that increase in temperature (by about 2°C) will decrease wheat yields ranged from 1.5 to 5.8% and similar will be impact on rice yields. Hence it is essential that strategies be worked out to increase the productivity under such adverse conditions and reduce the post harvest losses. With this background a national seminar was held at CIPHET during March 15-16, 2008 on Environmental Control for Plants, Animals and Fisheries to discuss these issues and work out the strategy and plan future course of action to meet the challenges through engineering interventions in terms of design of structures, developing the control systems and so on.

The CIPHET has also initiated a programme for creating awareness in entrepreneurship development in modern food processing technologies. Under this programme CIPHET will be conducting one-day workshop at different places in the country in collaboration with the Universities, Ministry of Small and Micro Enterprises, State Department of Agro Industries as well Agricultural Marketing Boards. One such programme was held at Thapar University on March 25, 2008.

The involvement of women in food processing is essential for decentralized production of high quality processed food through SHGs. This has been very well demonstrated by Lijjat Papad experience in the country. Hence to expose enterprising farmwomen to modern food processing technology, in this month a four days Entrepreneurship Development Training was organized jointly by IFFCO, IFFCO Foundation and CIPHET. We are planning many more such activities with IFFCO, IFFCO foundation and ATMA so that gainful employment to farm women is provided in scientific processing amla, ber and guava.

With best regards

R.T. Patil,
Director

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A National Seminar on “Opportunities and Challenges of Arid Horticulture for Nutrition and Livelihood” held at CIAH, Bikaner on 8-9th March, 2008.

[National Seminar for Plants, Animals and Fisheries at CIPHET Ludhiana](#)

A two-day National Seminar on Environmental Control for Plants, Animals and Fisheries at the Central Institute of Post Harvest Engineering & Technology (CIPHET), Ludhiana during March 15-16, 2008.

[Workshop on Entrepreneurship Development in Modern Food Processing Technologies](#)

To motivate the upcoming entrepreneurs in taking up food processing activity a one day workshop was organized by CIPHET in collaboration with MSME and Science & Technology Entrepreneur's Park (STEP), Thapar University at Patiala.

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The first Consortium Implementation Committee (CIC) meeting of NAIP sub-project on “Development of nondestructive systems for microbial and Physico- chemical quality parameters of mango” held at CIPHET, Ludhiana on 28. 03.08.

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The Launching Workshop of NAIP subproject on, “Development of nondestructive systems for evaluation of microbial and physicochemical quality parameters of mango” held at consortium lead centre, CIPHET, Ludhiana on 29.03.2008.

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Four days EDP Training for farm women organized jointly by IFFCO, IFFCO Foundation and CIPHET, Abohar.

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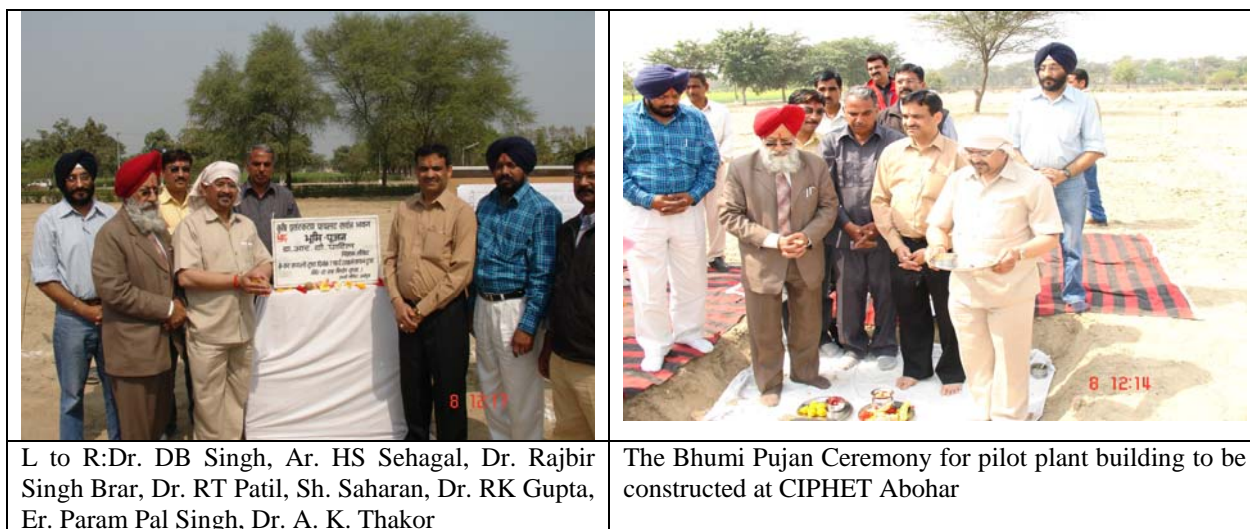
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Bhumi Pujan of Pilot Plant Building at CIPHET, Abohar

Bhumi Pujan of Pilot Plant Building to be constructed by CPWD at CIPHET, Abohar was done on 7th March 2008. Dr. R.T. Patil, Director CIPHET performed bhumi puja ceremony and laid down the foundation stone of the proposed building. Once this building will be constructed, seed cleaning plant, ginning plant and other fruits and vegetables processing equipments and machines developed by HCP Division, CIPHET, Abohar will be housed in this building for demonstration, training and commercial operations on custom hire basis as technology

incubation facility. On this occasion Dr. R.K. Gupta, Head, HCP, Ar. H.S. Sehgal, staff of CIPHET, Abohar and staff of CPWD were also present. Ar. H.S. Sehgal also explained the details about proposed building with the help of conceptual drawings.



L to R: Dr. DB Singh, Ar. HS Sehgal, Dr. Rajbir Singh Brar, Dr. RT Patil, Sh. Saharan, Dr. RK Gupta, Er. Param Pal Singh, Dr. A. K. Thakor

The Bhumi Pujan Ceremony for pilot plant building to be constructed at CIPHET Abohar

Post Harvest Technology of Arid Horticultural Crops

A National Seminar on “Opportunities and Challenges of Arid Horticulture for Nutrition and Livelihood” was held at CIAH, Bikaner on 8-9th March, 2008. Dr. R. T. Patil, Director attended this seminar and presented a lead paper titled “Processing of Arid Horticultural Crops-Present Status and Future Prospects”. Various food growers associations from Maharashtra and Karnataka also attended this seminar and were interested in Post Harvest Management and Value Addition of Arid Fruits. In his lead lecture Dr. Patil covered important arid horticulture crops like *ber*, pomegranate, *amla* and important vegetables crops having nutraceutical potential like Khejri (*Prosopis sineraria*), Kachari (*Cucumis callosus*), Lassora (*Cordia myxa*), Ker (*Capparis deciduas*).

The Indian arid zone occupies nearly 12 per cent of the total area and covers over 3.2 lacs sq. km area located in Rajasthan, Gujarat, Andhra Pradesh, Punjab, Haryana, Karnataka and Maharashtra. Besides, there is about 70300 sq. km area under cold arid zone extending over Leh and Kargil districts of Jammu and Kashmir; Lahaul, Spiti, and parts of Chamba and Kinnaur districts in Himachal Pradesh. The arid regions are rich with invaluable germplasm of some of the most drought hardy fruit flora. The arid edible fruits are rich in nutritive and medicinal values and therefore have potential for commercial processing and value added products.

National Seminar for Plants, Animals and Fisheries at CIPHET Ludhiana

A two-day National Seminar on Environmental Control for Plants, Animals and Fisheries was held at the Central Institute of Post Harvest Engineering & Technology (CIPHET), Ludhiana during March 15-16, 2008. In the inaugural session held on March 15, 2008, Dr. R.T. Patil, Director, CIPHET welcomed all the delegates/dignitaries, scientists/researchers and participants to the session. After briefly discussing the climatic requirements for plants, animals and fishes,

he laid emphasis on the importance of engineering interventions for improving the productivity of plants, animals and fisheries. He emphasized that with climatic change each degree rise in temperature above threshold value has deleterious effect on productivity of cattle poultry, pig and even cereal grains and hence with a view to identify the researchable issue this seminar has been planned at CIPHET.

Dr. O.D. Wanjari, Head, AS&EC, CIPHET, Ludhiana and Convener for the seminar presented a brief about the divisional activities, technologies developed and the background behind the seminar.

Dr. M.S. Kang, Vice Chancellor, PAU, Ludhiana and special guest for the function expressed concerns about the declining productivity, increasing population and decrease in cultivable area. He used the example of milk production in country where though India is the largest producer of milk in the world, the per capita availability is still quite low.

Dr. S.M. Ilyas, Director, National Academy for Agricultural Research & Management (NAARM), Hyderabad and special guest for the session emphasized on the need of developing multipurpose structures and develop technologies so that the complete benefits of a technology could be realized. He further stressed upon an important point of optimizing the parameters for utilization of resources and encouraged farmers to take up other occupation such as livestock rearing besides crop production under controlled conditions.

Dr. Nawab Ali, Deputy Director General (Engineering), ICAR, New Delhi and Chairman for the session explicitly stated that just like humans who perform better in congenial environment, plants, animals and fishes which are biological machines also need proper conducive environment to flourish. He expressed that the environment is an important input which results in higher output and optimized yield.

Dr. Anwar Alam, Vice Chancellor, SKUAS&T, Srinagar and Chief Guest for the function stressed upon the need for engineering interventions and development of technologies for expanding vertically for increased productivity in all sector for development of landless labourers or farmer will small land holdings. During his address, he made a mention of a few technologies such as design of structures and environmental control measures, use of plastics, nursery raising in greenhouse, vegetable propagation, solid and liquid waste management for bio-energy, organic farming and modernization of existing farms which could be adopted for increasing productivity. Dr. S.N. Jha, Sr. Scientist, CIPHET, Ludhiana thanked the dignitaries, participants and audience.

Following invited papers were presented in the technical sessions;

1. **Environmental control for crops animals and fish production** – Dr. Pitam Chandra ADG (PE) and Dr. Nawab Ali, DDG (Engg.), ICAR, New Delhi
2. **Overall Development of Covered Crop Cultivation** – Dr. N. P. S. Sirohi, Incharge, Centre for Protected Cultivation Technology, IARI, New Delhi
3. **Vegetable production in controlled/modified environment** – Dr. Anant Bahadur, Scientist, IIVR, Varanasi

4. **Modeling procedure of greenhouse environment for various applications** – Dr. Dilip Jain, Sr. Scientist, CIPHET, Ludhiana
5. **Covered crop cultivation - experiences of APA** – Dr. P. R. Bhatnagar, PC, AICRP on APA, CIPHET, Ludhiana
6. **Micro-climate control in Green house & Nurseries** – Dr. Devinder Dhingra, Sr. Scientist, CIPHET, Ludhiana
7. **Bio-degradable plastics for mulching** – Dr. S. K. Nanda, PC, AICRP on PHT, CIPHET, Ludhiana
8. **Engineering principles and environmental control for sustainable aquaculture in India** – Dr. B. C. Mal, Head, Agricultural Engg., Department, I.I.T., Kharagpur
9. **Portable FRP Carp Hatchery: An environment friendly system** - Dr. B. C. Mahapatra, Sr. Scientist, CIFA, Bhubaneswar
10. **Current status of livestock shelter and some recent advancements** – Dr. S. M. Ilyas, Director, NAARM, Hyderabad
11. **Impact of Scientifically Designed and Controlled Environment Structures on Animal Comfort and Productivity** – Dr. R. T. Patil, Director, CIPHET, Ludhiana
12. **Future scope for development of animal shelter in India** - Dr. P. K. Srivastava, Dean, College of Agricultural Engineering, Gangtok
13. **Theoretical considerations for design of animal shelters** – Dr. S. Chopra, Scientist (SG), CIPHET, Ludhiana
14. **Role of Architect in animal housing for enhanced productivity** - Sh. H. S. Sehgal, Sr. Architect (Retd.), PAU, Ludhiana
15. **Feed densification and palleting** - Dr. Jai Singh, Ex-OSD, CIPHET, Ludhiana
16. **Cold chain for horticultural produce** – Dr. Mahesh Kumar, PAU, Ludhiana
17. **Efficient pilot scale evaporative cooled storage structure for fruits and vegetables** – Dr. S. N. Jha, Sr. Scientist, CIPHET, Ludhiana
18. **Packaging of food materials** – Dr. K. K. Singh, Head, FG&OP Div., CIPHET, Ldh.
19. **Modified atmosphere packaging for vegetables** – Dr. D. R. Rai, CIPHET, Ludhiana
20. **Jet based systems for food processing and environmental control** – Dr. K. Narsaiah, Sr. Scientist, CIPHET, Ludhiana
21. **Controlled environment packaging of fruits and vegetables** – Dr. Matthew Prasad, Head, TOT Division, CIPHET, Ludhiana



L to R Dr. OD Wanjari, Head AS&EC, Dr. SM Ilyas, Director, NAARM, Dr. A. Alam, VC, SKUA&T, Srinagar, Dr. MS Kang, VC, PAU Ludhiana, Dr. Nawab Ali, DDG (Engg) and Dr. RT Patil Director, CIPHET



Institute publications being released by Chief Guest and Guests of Honour



Technical Session in progress L to R: L to R Dr. OD Wanjari, Head AS&EC, Dr. SM Ilyas, Director, NAARM, Dr. PK Srivastava, Dean, CAU, Gangtok, Dr. Jai Singh, Former Director, CIPHET and Dr. RT Patil, Director, CIPHET

Workshop on Entrepreneurship Development in Modern Food Processing Technologies

The data of CIPHET suggests that food processing is a rapidly growing sector and there is a great scope and potential to establish processing enterprises at production catchments. The investment of as little as 10 lakh in this sector can provide 1.8 direct jobs and 6.4 indirect jobs. The employment per plants ranges from 3 in cold stores to 14 in confectionary industry. Similarly value addition in food is also one of the highest in manufactured goods. The value addition to the order of 20% in cold stores and 273% could be achieved in manufacturing of chutneys and pickles. The growing middle class, higher disposable income and growing number of families where both spouses working has developed a favorable environment for easy marketability of processed foods. This is reason why the multinational and corporates have entered into retailing of processed foods and vegetables. To motivate the upcoming entrepreneurs in taking up food processing activity a one day workshop was organized by CIPHET in collaboration with MSME and Science & Technology Entrepreneur's Park (STEP), Thapar University at Patiala. The workshop aimed at providing insight for entrepreneurial development in Food Processing and setting up of such units through expert discussion and lectures on importance and need of food processing, requirements for setting up of food processing units and how to minimize post-harvest losses through value addition of agricultural produce. More than 60 youths had participated. The morning session had welcome address by Dr. Abhijit Mukherjee, Director, Thapar University, a key note address on Opportunities in post harvest management and value addition based on CIPHET technologies by Dr. RT Patil, Director, CIPHET followed by lecture by Dr. SK Nanda, Project Coordinator AICRP(PHT) on food processing technologies developed under the project. In the afternoon Dr. Mathew Prasad explained the role of Transfer of Technology division of CIPHET. Dr. Sanjay Nigam, Asstt Director (Food), MSME delivered a lecture on various schemes and incentives by Government of India for food processing sector. This was followed by narration of experiences by two successful entrepreneurs namely Mr.Sanjay Kapoor, Ambala Associates, manufacturer of processing machines for seeds, grains and fruits and Mr. HPS Lamba from Breverly Beverages, Patiala who package health and nutri drinks for Cadila. The programme was wrapped up by Dr. Dinesh Goyal, Executive Director, STEP, Thapar University. The programme was highly appreciated by the participants and many expressed their interest in one week technology based EDPs conducted at CIPHET. Looking to the success of this programme CIPHET has planned to replicate the experience of one day workshop in different places in the country. The institute has now written to all state agri marketing boards, agro industries corporations for collaboration and financial support for conducting such programs so that entrepreneurship in the food-processing sector can be increased to help prevent the post harvest losses to the fresh raw produce.



L to R: Dr. SK Nanda, PC(PHT), Dr. RT Patil, Director, CIPHET, Dr. Abhijit Mukherjee, Director, Thapar University, Dr. Dinesh Goyal Ex. Director, STEP and Dr. Matthew Prasad, Head, TOT, CIPHET

NAIP Meetings at CIPHET

The first Consortium Implementation Committee (CIC) meeting of NAIP sub-project on “Development of nondestructive systems for microbial and Physico- chemical quality parameters of mango” under the chairmanship of Dr. R. T. Patil, Director CIPHET, Ludhiana was held at CIPHET, Ludhiana on 28. 03.08. The following consortium partners members were present; Dr. Raman Suri, CCPI, IMTECH, Chandigarh, Dr. Nachiket Kotiwaliwale, CCPI, CIAE Bhopal, Dr. Abhijit Kar, CCPI, IARI, New Delhi, Dr. K. Narasaiah, Co- PI at lead center, Dr. Ramesh Kumar Co-PI, CIPHET, Abohar, Mr. Vijay Kumar, AF& AO, CIPHET, Ludhiana, Mr. Tej Ram A.O., CIPHET, Ludhiana and Dr. S. N. Jha, CPI and member- secretary. Chairman, Dr. R. T. Patil reviewed the progress made so far in terms of hiring manpower and purchase of equipment by each center and expressed his satisfaction at the progress.

The first Consortium Advisory Committee meeting Meeting of NAIP Sub-Project on “Development of Nondestructive System for Evaluation of Microbial and Physicochemical Parameter of Mango” under the chairmanship of Dr. Suresh Prasad, Professor IIT, Kharagpur was held at CIPHET, Ludhiana on 29.03.08 at 2.30 pm. The CAC members were; Prof. E.S. Raja Gopal, IISc, Bangalore, Prof. D. C. Joshi, AAU, Anand, Dr. A. Bandyopadhyay, NC, NAIP, ICAR, Dr. R. T. Patil, Director, CIPHET, Ludhiana and Dr. S. N. Jha, CPI & Member Secretary. At the outset of the meeting, Dr. S. N. Jha, CPI and Member Secretary welcomed the Chairman and CAC members. Dr. A. Bandyopadhyay explained briefly the TOR, and powers of and expectations from the CAC within the governance structure of the NAIP. The consortium partners presented their respective technical programmes and progress of work.

Launching Workshop of NAIP sub project at CIPHET Ludhiana

The Launching Workshop of NAIP subproject on, “Development of nondestructive systems for evaluation of microbial and physicochemical quality parameters of mango” was held at consortium lead centre, CIPHET, Ludhiana on 29.03.2008. The workshop was attended by

scientists from CIPHET, PAU, Ludhiana, IMTECH, Chandigarh and stakeholders, Reliance and Field Fresh (corporate fruits and vegetables retailers) and farmers. Prof. Suresh Parsad, Emeritus Professor IIT Kharagpur and Chairman of the CAC was the chief guest and Professor E. S. Raja Gopal, IISc, Bangalore, Dr. D. C. Joshi, Anand Agricultural University, Anand, and Dr. A. Bandyopadhyay, National Coordinator, NAIP, ICAR, were the guests of honour. Dr. R. T. Patil, Director, CIPHET, presided and the CPI, the CCPIs and the Co-PIs were the official participants in the workshop.

Dr S. N. Jha, Consortium PI, welcomed the delegates and other guests. Thereafter Dr. R. T. Patil presented the brief overview of CIPHET and its achievements. Dr. A. Bandyopadhyay, NC, briefed the gathering about the NAIP as a whole and objectives of Component – 4 in particular. The CCPIs made brief presentations on their respective institutions and their major achievements. Dr. S. N. Jha, Consortium Principal Investigator (CPI) presented an overview of the project. Dr. Suresh Prasad the chief guest launched the project by releasing the information brochure of the subproject. This was followed by a very useful discussion with the stakeholders on their needs with respect to PHT for fruits in general and their expectations from the sub-project in particular. All the experts stressed on the need for knowledge sharing between the stakeholders and the scientists in the sub-project. Dr D.C. Joshi stressed the need for scientific solution to non-destructive detection of fruit fly infestation in mango. Dr. R. T. Patil advised the stakeholders to be in regular contact with the scientists of CIPHET for their problems related to post harvest handling and value addition of the agriculture produce. The session ended with a vote of thanks by Dr. K. Narsaiah.



L to R: Dr. Raj Gopal, Dr. RT Patil, Dr. Suresh Prasad Chairman CAC and Chief Guest, Dr. Bandopadhyay, Dr. DC Joshi and Dr. OD Wanajri

A poster session was also organized on history, maturity, harvest, diseases and disorder development in mango in the afternoon.

Monthly Hindi Workshop at CIPHET Ludhiana

हिन्दी की मासिक कार्याशाला एवं संगोष्ठी के अंतर्गत संस्थान के सभा कक्ष में दिनांक 19.03.2008 को डॉ. के. नरसईया द्वारा परिणामक्रम पर प्रस्तुतीकरण किया गया, जिसमें संस्थान के निदेशक एवं समन्वयक, प्रभागाध्यक्ष, प्रभारी अनुभाग, प्रशासनिक, तकनीकी और सहायक सभी अधिकारी व कर्मचारी उपस्थित थे ।

EDP Training of Farm Women at Village Panjkosi (Abohar)

Four days EDP Training for farm women was organized jointly by IFFCO, IFFCO Foundation and CIPHET, Abohar. Hands on Training on Food Processing aspects such as Aonla, guava and pomegranate product preparation was given by the CIPHET Staff to the trainees. Sh. Surendra Jakhar Chairman IFFCO inaugurated the training. On this occasion Dr. R.K. Gupta Incharge CIPHET and Mr. R.C. Gawri Divisional Manager of Fazilika Center Cooperative Bank were also present.



Dr. R. K. Gupta Head, HCP, CIPHET and Sh. Surendra Jakhar Chairman IFFCO at Inaugural Session of Women EDP programme



Training and demonstration in progress

Technology based EDP on Food Processing

Technology based EDP on Food Processing sponsored by DST was organized by the NITCON Chandigarh, with active collaboration with CIPHET, Abohar. The duration of training was 6 week from Mid February to March 2008. About 22 young Entrepreneurs participated in the training and shown keen interest on fruits and vegetables processing activities.



NITCON-CIPHET EDP in Food Processing at CIPHET Abohar

Quinnquennial Review of All India Coordinated Project on Application of Plastics in Agriculture

Quinnquennial Review Team comprised of Dr. A. Alam, Vice-Chancellor, SKUAS&T, Srinagar as the Chairman and Dr. Brahm Singh, Ex-Director, FRL, Leh; Dr. K.N. Tiwari, Professor, Dept of Agricultural and Food Engineering, IIT, Kharagpur; Dr. K.G. Varshney, Ex-Professor, ANGRAU, Hyderabad; and Dr. U. K. Swaroop, General Manager (Business Development), Reliance Industries Limited, Mumbai as members. On 15-16 March 2008, the QRT visited PAU, Ludhiana and CIPHET, Abohar centers. On 15th March 2008, the QRT visited the APA Experimental farm of PAU where different studies on Greenhouse, mulching and drip irrigation were reviewed. The team also visited the outreach activities of PAU center in the farmer's field in Moga district to see the polyhouses, net houses, low tunnels and drip irrigation used by farmers.

Quinnquennial Review Team visited cooperating centre of CIPHET, Abohar on 16 March 2008. Dr. R. K. Gupta, Head (HCP) and Incharge, CIPHET, Abohar welcomed all the members and briefed the achievements of the centre in last five years. He also elaborated different technologies developed by CIPHET and other activities conducted at the centre. He detailed the master plan of CIPHET, Abohar and explained the future plans of the division. Dr. Anwar Alam also inaugurated the Gas and liquid Chromatography (GC) facility created at the division. He also interacted with all the scientists and urged them to develop technologies for entrepreneurs and farmers so that the expectations of the council can be fulfilled.

Dr. P. R. Bhatnagar, PC (APA) elaborated the salient achievements of the centre. Dr. Rajbir Singh, Project Leader of cooperating centre, presented the progress report of cooperating centre and explained the progress of research projects and extension activities of the centre. The team visited the experimental field and showed their satisfaction on the on-going projects. The team was also exposed to outreach activities of the centre and interacted with farmers who adopted the technologies. The team visited Billa Patti, Kala Tibba, Khubban where microirrigation and use of low plastic tunnels are being adopted in different fruits and vegetable crops. The team also visited hi-tech nursery at Maujgarh and were impressed with the use of plasticultural techniques and suggested to prepare a video of the nursery and need to popularize and highlight such type of

activities for scientific management of planting material for supply to the farmers. At many places Dr. Anwar Alam were honoured by the farmers and thanked him for his visit and guiding the scientists, entrepreneurs and farmers. The team was also exposed to Multi-Juice Extraction Plant at Alamgarh.



Visit QRT of AICRP (APA) to CIPHET Abohar

Quinnquennial Review of All India Coordinated Project on Post Harvest Technology

The Quinquennial Review Team (QRT) of All India Coordinated Research Project on Post Harvest Technology had its first meeting on March 13, 2008 at CIAE, Bhopal to review the progress of different centers in the Central Region. The meeting was held under the chairmanship of Dr. Satish Bal, Professor Emeritus, IIT Kharagpur. The other members of QRT were Dr. RK Jain, Principal, ADIT, Vallabvidyanagar, Dr. US Shivhare, Professor, Panjab University, Chandigarh and Dr. Ashish M Paturkar, Professor, Bombay Veterinary College, Mumbai. Dr. D. Dhingra, Sr. Scientist, CIPHET, Ludhiana acted as the Secretary of QRT. Dr. SK Nanda, Project Co-ordinator of AICRP on PHT was also present during the meeting. Principal investigators and Research Engineers of altogether 7 centres (viz. CIAE Bhopal, AMU Aligarh, NDUAT Faizabad, JNKVV Jabalpur, RS&JRS Kolhapur, GBPUAT Pantnagar and

YSPUH&F Solan) presented the progress, salient achievements and constraints of their centers during 2002-2007 to the members of QRT.

The second meeting of this QRT was held at MPUA&T, Udaipur on 17 March 2008. Principal investigators and Research Engineers of altogether 8 centres (viz. MPUAT Udaipur, PDKV Akola, HAU Hisar, RAU Jaipur, CAZRI Jodhpur, JAU Junagadh, SKUAS&T Srinagar and PAU Ludhiana) presented the progress, salient achievements and constraints of their centers during 2002-2007 to the members of QRT.



L to R: Dr. RK Jain, Dr MM Pandey, Dr. Satish Bal, Chairman QRT, Dr. SK Nanda and Dr.

Distinguished Visitors



Dr. A. Alam, VC, Sher-E-Kashmir University of Agricultural Sciences & Technology, Srinagar visited CIPHET on March 10, 2008



Dr. R. C. Maheshwari, VC, Sardarkrushinagar Dantiwada Agricultural University, Palanpur, Gujarat, visited CIPHET on March 11, 2008

Employment opportunities at CIPHET

“Walk-in-Interview” will be held at Central Institute of Post Harvest Engineering & Technology, Ludhiana for the following positions on Contractual basis. Eligible and desirous candidates fulfilling all the requirements should bring their application giving full details of academic records and experience alongwith attested photocopy as well as original copy of the relevant documents and a passport size photograph.

Sl. No.	Name of the positions	No. of positions	Duration	Emolument	Qualification	Age limit as on 1.1.2008	Date of Interview
1.	Senior Research Fellow (Agril. Structure & Process Engineering)	One	Upto June 2012	Rs 12000/- per month for 1 st & 2 nd year Rs 14000/- per month for 3 rd year + HRA.	M.Tech. in Agricultural Structures & Process Engineering or Post Harvest Engg. Or Food Process Engineering. Two years experience in any recognized institute OR Ph.D in Agril. Structures & Process Engg or Process & Food Engg. Post Harvest Engg. with specialization in Post Harvest Engg. & Technology.	35 years for men 40 years for women	30 th April 2008 at 11.00 AM
2.	Senior Research Fellow (Food Technology)	One	Upto June 2012	-do-	M.Sc in Food Science & Technology Two years experience of working in food technology in any recognized institute. Or Ph.D in Food Sci. & Technology.	35 years for men 40 years for women	30 th April 2008 at 11.00 AM

Terms & Conditions

1. Above positions are purely temporary, time bound and co-terminus with the project.
2. Age relaxation will be 5 years for SC/ST and 3 years for OBC candidates.
3. Place of work will be CIPHET, Ludhiana.
4. No TA/DA will be paid for appearing in Interview.
5. All eligible candidates are requested to be present 30 minutes before scheduled time on the date of Interview for necessary formalities.
6. No objection certificate from the Employer/University, in case he/she is in employment elsewhere/doing Ph.D.
7. Canvassing in any form will disqualify the candidature.
8. The director's decision will be final and binding in all respects.

**E-mail: dhingra1967@yahoo.com, Fax: 0161-2308670, Tel No. 0161- 2303171; 2304170
Ext.207**

Technology of the month

Ready to Constitute *Makhana keer* Mix

Makhana is a popped kernel of seeds of gorgon nut (*Euryale ferox* Salisb). It is an aquatic crop in India and is available as wiled in various Asian countries. It is considered to be a cash crop and its popped kernel is marketed throughout world as dry fruit. Bihar is the major producer of *makhana*, contributing more than 80 % of total production in India. Other states such as East Bengal, Assam, Orissa, Madhya Pradesh, Rajsthan, J & K, Tripura and Manipur also produce *makhana* in small quantities.

Makhana, being rich in carbohydrate, protein, minerals etc. (Table 1) is used for various purposes. It has been also reported that *makhana* has medicinal value and is used as an important ingredient in preparation of indigenous tonics. *Ayurveda* and *Unani* texts have accepted its aphrodisiac and spermatogenic properties. The proximate analysis of popped *makhana* is given in Table 1. Both raw and fried *makhana* are fairly rich in essential amino acids and nutritionally comparable to those of fish with respect to essential amino acid index and chemical score.

Table 1. Proximate composition of popped *makhana*

CONSTITUENTS	PER 100 g	CONSTITUENTS	100 g
Moisture	12.8 g	Carbohydrate	76.9 g
Protein	9.7 g	Calcium	20.0 mg
Fat	0.1 g	Phosphorous	90.0 mg
Minerals	0.5 g	Iron	1.4 mg
		Energy	347.0 Kcal


Fried *makhana* with salt or sugar are very widely used as snack foods. *Makhana kheer* is one of the delicious item being eaten in select areas of country. Popped *makhana* is bulky in nature and thus become costly at distant places due to high transportation cost. To overcome this product and having high acceptability a new product “ready to constitute *makhana kheer* mix” has been developed.



Ready to constitute *makhana kheer* mix

The developed ready to constitute *makhana kheer* mix is a new product using ground *makhana* and sugar as main ingredients. The mix is a homogeneous mass of ingredients, which cannot be separated easily as in case of a simple admixture of different ingredients. The grinding of *makhana* in developed process is done at normal room conditions without heating the *makhana*, whereas it is done after roasting the *makhana* in iron pan on fire in the conventional process. The developed process thus eliminates an operation and minimizes the energy consumption. Use of this mix for preparation of *makhana kheer* eliminates the cooking processes followed in the conventional household method. The developed ready to constitute *makhana kheer* mix has longer shelf life and can be transported at much lower cost as compared to that of raw popped *makhana* to any where for marketing for better remuneration. It saves time and energy in preparation of *makhana kheer*. Simple potable normal or hot/warm water is added in the mix and stir for a while and *makhana kheer* is ready to eat. A patent has been applied by CIPHET for this technology and is ready for licensing to *Makhana* food processors for diversification of their product range.

Publications of the month

 <p>Vol. VII Nos 3 & 4 POST HARVEST ENGINEERING & TECHNOLOGY - UPDATE July to December, 2007</p> <p><i>From The Director's Desk....</i></p>  <p>Creation of post harvest management and value addition infrastructure in the catchment area can improve the economic condition of the farmers and also motivate them for crop diversification. Government alone cannot do this but greater partnership of private sector is required. Large corporates are coming up in a big way into this field. There is need to promote smaller entrepreneurs too so that economic benefits of this new wave are equally distributed. In this direction the institute organized valuable entrepreneurship development programmes on minimal processing and modified atmosphere packaging of fruits and vegetables; establishment of food processing industries; dehydration of fruits and vegetables; preservative processing and value addition, value addition of horticultural produce, and grading and shrink wrapping of fruits and vegetables, during this period. Under human resources development winter schools on 'Nondestructive and biosensing methods for food safety and quality assurance' and 'Bio processing technologies in utilization of crop residues for production of enzymes and bio-fuels' were organized. International training programmes for scientists from Egypt and Myanmar were arranged by CIPHET. National seminars on 'Application of Engineering Principles and Mathematical Modeling in Food Processing' and 'Identification of Appropriate Primary Processing Technologies for Value addition of minor forest produces in tribal areas: a step in rural development', were organized. The EDPs, winter schools and seminars got overwhelming response from all over the country. Awareness programme on Warehousing (Development and Regulation) Bill 2007 was organized in collaboration with Central Warehousing Corporation.</p> <p>Progress of research work (completed & on going) and eleven new projects were thoroughly discussed in the institute research council meeting. During this period proposals under NAIP (National Agricultural Innovation Projects) were prepared and submitted by the scientists. Proposal on 'Development of nondestructive systems for evaluations of microbial and physico-chemical quality parameters of mango and apple' has been approved. CIPHET has been awarded consultancy in the area of post harvest engineering and equipments and value addition of farm/forest produce under NAIP proposal 'Livelihood improvement and empowerment of rural poor through sustainable farming systems in North East India'.</p> <p>Central Water Commission, Ministry of Water Resources, GOI has approved a project for building demonstrations on food processing technology in forty villages of Punjab, Rajasthan, Uttaranchal and HP under Farmers Participatory Action Research Programme. Dept. of Science and Technology (DST) has awarded two projects namely on (1) non-destructive techniques and (2) processing of millets.</p> <p>Hindi language activities were strengthened as the institute got an opportunity to host meeting of Ludhiana Rajbhava Samiti. Publication of 'Krishi Durpan' a newsletter in Hindi has been initiated. Overall the second half of year 2007 was full of activities and achievements in the area of research and extension.</p>  <p>(R.T. PATIL)</p> <p>IN THIS ISSUE</p> <ul style="list-style-type: none"> ■ From the Director's Desk ■ Research Highlights ■ AJCRPs ■ Programmes Organized ■ Papers Published / Presented ■ Programme Participation ■ Personalia ■ Visitors <p>Central Institute of Post Harvest Engineering & Technology, Ludhiana, (Punjab)</p>	<p>INFORMATION BROCHURE OF NAIP SUBPROJECT</p> <p>Development of Nondestructive Systems for Evaluation of Microbial and Physico-Chemical Quality Parameters of Mango</p> <p>(Basic and Strategic Research in Frontier Areas; Component 4)</p>  <p>Partners</p> <p>CIPHET, Ludhiana (Lead Centre) CIAE, Bhopal IARI, New Delhi IMTECH, Chandigarh</p>  <p>Central Institute of Post-Harvest Engineering and Technology, Ludhiana - 141004</p>
CIPHET Newsletter July-Dec 2007	NAIP Sub Project Brochure

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