



# Central Institute of Post Harvest Engineering & Technology Ludhiana

**OUR SLOGAN: PRODUCE, PROCESS AND PROSPER**

**CIPHET E – Newsletter for March 2009  
Vol. 4 No. 3**

## Director's Column



Dear All,

India is rich in its vegetation and various types of flowers are grown in India, due to different type of agro climate and soil type available in the country. The organized cultivation in the fields as well as in the green houses is getting popular due to use of flower in day-to-day life. The growing middle class and the habit of exchanging greetings with flowers have made this business quite profitable. The National Conference on Floriculture for Livelihood and Profitability threw light on the post harvest management and value addition of flowers. Important topics like dried flowers, commercial flowers, value added floral arrangements, extraction of antioxidant activities were discussed. Since the collection of the flowers is well channelized as compared to other horticultural commodities, we at CIPHET feel that there a great scope for their small scale processing to extract natural color, flavor and also phyto-chemical like anti-oxidant.

Minor cereal and millets crops are grown under diverse climatic conditions with lesser inputs and considered as nutria-cereals possess unique nutrients and bioactive components. Similarly whey from milk processing also has many nutritional benefits. A NAIP project at NDRI is a very important initiative to develop nutritious and health foods by effective utilization of milk by products and crops like pearl millet and barley.

This month CIPHET provided training on "Post Harvest Management and Value Addition of Horticultural Produce" to a group of farmers from Jhalawar (Rajasthan) and Four days Training to Farm Women on processing and value addition of fruits and vegetables. Training was also organized on Primary Processing of Medicinal & Aromatic Plants for Twenty four participants from Ludhiana district. Also to help NEH region to increase the profitability of farmers through PHT two training programs were organized for participants from Assam sponsored by State Institute of Rural Development, Guwahati. One day Industry interface on Recent Advances in Coating and Waxing Technology of Fruits was also conducted at CIPHET Abohar in collaboration with Indian Institute of Natural Resins and Gums, Ranchi.

In coming months CIPHET will be organizing three winter schools sponsored by ICAR on on advanced technologies in niche areas such as novel packaging technologies, value addition to livestock produce and mathematical modeling and simulation.

The appropriate equipment development is an important activity of CIPHET and this month we are reporting a development of a castor depodder and decorticator costing Rs. 25000 and having capacity of 150 kg/h to meet the demand of castor processing industry.

With best regards,

**R.T. Patil  
Director**

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## **Minimal Processing of Fruits and Vegetables**

Mainly due to delay between harvesting and value addition we incur losses in high value perishable commodities. Many a times fruits and vegetables are required by the consumer in fresh and convenient form and they are willing to pay for such services. The simple washing, blanching, cutting, sorting, dehydration, osmo-dehydration and modified atmosphere packaging are some of the unit operations, which are used in minimal processing of fruits and vegetables. My lecture covered the theory and examples of minimally processed products and the technologies and equipments developed at CIPHET, Ludhiana, for minimal processing. The equipment are basket centrifuge, banana hand cutter, pomegranate aril extractor, groundnut pod grader, sunflower dehuller and minimally processed product developed at CIPHET such as minimally processed pomegranate arils, chopped cabbage, dried carrot, washed dried and graded groundnut, roasted sunflower seeds, dried garlic slices, anardana, osmo-dehydrated ber, modified atmosphere packaging of battle leaf, okra & broccoli and so on. The Central Institute of Agricultural Engineering at Bhopal had organized a winter school on ‘Novel Techniques in packaging, storage, processing and quality control of fruits and

vegetables' and Dr. Patil, Director, CIPHET delivered a lecture on "Minimal processing for preservation of fruits and vegetables and technologies developed at CIPHET on 07.03.2009.

## Floriculture for Livelihood and Profitability

Various types of flowers are grown in India, due to different type of agro climate and soil type available in the country. The organized cultivation in the fields as well as in the green houses is getting popular due to use of flower in day-to-day life. The growing middle class and the habit of exchanging greetings with flowers has made this business quite profitable. India herself is a big market of flowers due to their use in our spiritual and cultural habits. The export of flowers in India is also rising @100% per year. The cutting of flowers and arrangement of the flower is an art, which has been nurtured by the florist community of our country.



The National Conference on Floriculture for Livelihood and Profitability was held at IARI, New Delhi from March 15-18, 2009. Dr. Patil attended and Co-chaired a session on Post Harvest Management and Value Addition. The chairman of the session was Dr. SD Shikhamani, Ex- Director, IIHR, Bangalore and Vice Chancellor, UHS, Karnatka.

Following papers were presented in the conference-

1. Dried flowers-profitable floriculture product for global markets – Dr. Sangamma (IIHR, Bangalore).
2. Recent advances in post harvest management of commercial flowers – Dr. Khushal Singh (PAU, Ludhiana)
3. Development and marketing of value added floral arrangements – Dr. Alka Singh (GAU, Navasari)
4. Antioxidant activities of anthocyanin extracts of *Delonix regia* – M. Jawaharlal T. Senthilkumar, K. Indhumati & M. Ganga (TNAU, Coimbatore)
5. Commercial specialty cut flower production harvest systems – R.H. Dahiya (Jaipur)

Dr. Patil emphasized the need for training the existing manpower working in the industry like florist community for proper Post Harvest Management of flowers using the modern technology. The collection of the flowers is well channelized as compared to other

horticultural commodities due to the importance of their freshness for the consumers. Hence, the used or spent flowers from temples, marriage functions and other social functions provide a great opportunity for their processing to extract natural color, flavor and also phyto-chemical like anti-oxidant. However, the efforts are needed to develop the appropriate handling and processing technology, so that the flowers can be dissected, dehydrated and extracted properly. The dehydrated flowers can be used for making pot puree and many flowers can be used for further processing into novel products or for compost.

## **Assessment of Post Harvest Losses at National Level**

Dr. Patil, Director, CIPHET attended an expert committee meeting on PH Losses Analysis to review the data generated and compiled for PH losses assessment under All India Coordinated Research Project (Post Harvest Technology). Based on the recommendation of the parliament committee, this well planned mega project at the cost of Rs. 2.00 cr was the undertaken. The data was collected on 46 major crops/commodities in about 108 districts (1080 villages) spread over 14 agro climatic zones. The analysis of the data to arrive at the suitable conclusion was comprehensively presented by Dr. S.K. Nanada, PC (PHT), CIPHET, Ludhiana. The meeting was held under the chairmanship of Dr. A. Alam with members of the Expert Committee and concerned IASRI faculty as other participants. It was observed that the result were quite convincing satisfactory and consistent and showed a decreasing trends due to scientific interventions in post harvest management and value addition.

## **Composite Dairy Foods with Enhanced Health Attributes**

Minor cereal and millets crops are grown under diverse climatic conditions with lesser inputs. However now they are considered as nutria-cereals as they possess unique nutrients and bioactive components that may promote health of consumers, particularly those belonging to less privileged groups owing to there lower costs. Indian dairy sector with over 100 MT milk productions a 20 % level of processing is considered as a source of livelihood for 70 million farmers. Substantial quantities of skimmed milk and other by products including whey still go unprocessed owing to lack of alternatives. Technological advancements and nutritional benefits of milk solids in by products offer an opportunity to utilize them for product development. A project has been conceptualized to investigate the opportunities to develop nutritious and health foods by effective utilization of milk by products and two neglected agricultural crops i.e. pearl millet and barley. Hence a NAIP sub project on “A value chain on composite dairy foods with enhanced health attributes” was awarded to NDRI Karnal as lead center with CIPHET as one of the consortium partner. The launch workshop was organized at NDRI Karnal on 20-3-09. Dr. R.T. Patil, Dr S. Balasubramanian and Dr D N Yadav attended the launching workshop. Total outlay of the project is Rs 283.076 lakhs, out of which for CIPHET Rs 64.768 lakhs. The inaugural session was chaired by Dr. A.K. Srivastava, Director, NDRI, Karnal and Dr. J.P. Mittal, National Coordinator, Component-2, ICAR, New Delhi; Dr. V.B. Singh, Chairman, CAC, Former Vice Chancellor, MPUAT, Udaipur; Dr. A.K. Singh, PI & Sr. Scientist, NDRI, Karnal were on the dais.

The objectives of the project at Ludhiana are as follows:-

1. To harness the nutritional and therapeutic potential of milk by products (whey and skim milk) and underutilized plant species (pearl millet and barley) for development of functional foods.

2. To develop technological package for composite dairy foods (complementary foods, fortified convenience foods and probiotic milk cereal foods) with enhanced health attributes.
3. To validate the consumer acceptability and targeted health benefits composite dairy foods.
4. To assess the techno-economic feasibility of the newly developed technologies through lineages with industry, marketing personnel and self help groups.

### **Training of NITCON-EDP participants on Food Processing trained at CIPHET, Abohar**

An EDP on Food Processing was organized by North India Technical Consultancy Organization (NITCON), Chandigarh at Sirsa (Haryana) for food processing industries during Feb-March 2009. Thirty up-coming entrepreneurs participating in this training programme. A visit of entrepreneurs to CIPHET Abohar was organized on 4<sup>th</sup> March 2009 for interaction for one day course. During this training cum demonstration session participants were trained on preparation of value added products from Aonla such as jam, preserve, mouth fresheners etc. Dr. R.K.Gupta, Head, HCP has also explained the activities of CIPHET. The trainees also visited CIPHET Abohar on March 23, 2009 to get the guidance in soy processing. Sh Surindr Kumar, Entrepreneur owner of Milky Soya, Moga who has established soy-processing plant in Moga with the help of NITCON and CIPHET demonstrated soy product processing plant to the EDP trainees on 23<sup>rd</sup> March 2009 at CIPHET. Mr. Rishi Rai another soy entrepreneur also shared his experiences on soy product processing with the trainees.

	
<p><b>Demonstration of soy product processing plant to the EDP trainees</b></p>	<p><b>Participants of Technology based EDP</b></p>

### **Training on “Post Harvest Management and Value Addition of Horticultural Produce”**

One week training programme was organized on Post Harvest Management of Fruits and Vegetables during 9-15<sup>th</sup> March, 2009 at CIPHET, Abohar. A group of 15 farmers from Jhalawar (Rajasthan) sponsored by KVK, Jhalawar under MPUAT, Udaipur participated in the training programme. The training included lectures on production and post harvest management of fruits and vegetables, insects & pest control in fruits and vegetables, minimal processing of fruits and vegetables, plasticultural techniques for better productivity of fruits and vegetables and development of various value added products from fruits and vegetables.

The training also included the farm and orchards visit and practical classes on novel products from aonla, ber, guava, pomegranate etc. including demonstration of waxing plant. The participants also exposed visited CIPHET, Ludhiana visit, waxing and packaging unit of kinnow, hi-tech nursery and scientifically managed farmers orchards and farms. The training was conducted by Dr. R. K. Gupta, HOD (HCP) as Course coordinator and Shri Rajesh Kumar, Technical Officer, as Co-course coordinator.



**One week EDP on Post Harvest Management and Value Addition**



**Trainees giving feedback on EDP**

## **Industry Interface Meeting on Recent Advances in Coating and Waxing Technology of Fruits**

One day Industry interface meeting on **Recent Advances in Coating and Waxing Technology of Fruits** was organized at HCP Division, CIPHET, Abohar in collaboration with Indian Institute of Natural Resins and Gums, Ranchi on 16<sup>th</sup> March 2009. The programme was sponsored by M/s Shiva Cold Store, Abohar. About 20 members of Association of Kinnow Waxing and Grading Plants in Punjab participated in the meeting. Besides them, a good number of progressive farmers, Government officials, scientists and students had also participated in the meeting. The chief guest for the meeting was Sh. Surender Jakhar, Chairman, IFFCO and president, Association of Kinnow Waxing and Grading Plants in Punjab. Dr. PS Aulakh, Director, Fruits Research Centre (PAU), Abohar and scientists from IINRAG namely Dr. S. Srivastava and Dr. SKS Yadav also participated in the interface meeting. During the technical session, Dr. Srivastava from IINRAG presented information about the Lac based formulation prepared by them for extending the shelf life of Fruits and Vegetables. Dr. R.K. Gupta, Head, HCP and meeting coordinator presented a paper on Recent Trends in Waxing and Coating of Fruits for Extending Shelf Life (RT Patil and RK Gupta). In his presentation, Dr. Gupta emphasized the importance of waxing for enhancing the shelf life and firmness of fruits other than Kinnow during storage and transportation. During the discussion, it was decided that before the next Kinnow season, some of the plant operators may visit IINRAG, Ranchi and explore the possibility for commercial production of edible coating so that it could be used Kinnow Waxing and Grading Plants. It was also desired that CIPHET may help transferring the Know how for production of Lac based formulation so that the demand of the Kinnow Waxing and Grading Plants situated at Abohar and nearby can be met.



**Industry Interface Meeting at CIPHET Abohar**



**Technical session during Industry interface meeting**

### **IFFCO-CIPHET Farm Women Training and Visit**

Four days Farm Women Training and visit programme during 24-27<sup>th</sup> March 2009 was organized by IFFCO in technical collaboration with CIPHET at Village Mauzgarh near Abohar. Sh Sajjan Kumar Jakhar, Ex. Minister of Punjab was the Chief Guest. Dr. R.K.Gupta, Head, HCP delivered a lecture on processing and value addition of fruits and vegetables to the trainees. On 27<sup>th</sup> March, a visit to CIPHET, Abohar was organized and participants were shown the value addition of Ber and Aonla for preparation of various products such as jam, preserve, mouth fresheners etc.



**Dr R K Gupta delivering a lecture to the participants**



**Participants of IFFCO-CIPHET Farm Women Training**

### **CIPHET organizes Institute Management Committee meeting**

The Institute management committee meeting was held at CIPHET Ludhiana to discuss various issues related to management e.g. Construction work costing more than 25 lakhs, writing off of the staff car, functioning of the various committees and also to review the research and development activities of the institute. The external members who attended the meeting were; Dr. Pitam Chandra, ADG (PE), Dr. M. K. Garg, Dean CAE, Hisar, Dr. Shymal Banik, PS, NIRJAFT, Dr. Suresh Dhumal, Director, NIPHT, Pune, Mr. Feroze Masani, Agri Entrepreneur, Mr. Harinder Singh, Progressive farmer, Mr. Suresh Chandra, Sr. F&AO

The following important suggestion emerged from the deliberations

1. All the projects at CIPHET especially value addition project should have in built component of product quality and safety
2. The correct stage of harvest is very important for quality product and proper preservation. However it seems that the farmers are not paying much attention to this fact due to market demand, availability of harvesting and threshing equipment and hurry to plant the next crop. Hence extension literature on importance of right stage of harvest needs to be developed.
3. The very well graded and packaged fruits for export are not handled under controlled conditions at port of export and hence the quality at destination gets bad and country gets a bad name. Hence it was suggested that an exploratory survey type project may be initiated to look into the handling practices actually followed at the port of export.



**CIPHET IMC meeting in progress**

### **Training program on Primary Processing of Medicinal and Aromatic Plants**

A training program on Primary Processing of Medicinal & Aromatic Plants was organized at CIPHET during 23-25 March 2009. The programme was sponsored by Punjab State Council for Science & Technology, Chandigarh. Twenty four participants from Ludhiana district sponsored by ATMA attended the program. The lectures on cultivation & processing of important crops such as Aloe vera, stevia, mentha, safed musli, turmeric etc. were covered by faculty drawn from CIPHET and PAU. Dehydration of roots, leaves, seeds; steam distillation of oil, biochemicals present in medicinal plants etc. were also covered. A field visit to the factory of HOAP Industries situated in village Lakhowal, Ludhiana (Punjab) was organised on 25th March 2009.





**Participants of Training program on Primary Processing of Medicinal and Aromatic Plants**

### **Visit of Russian Student Delegation to CIPHET Ludhiana**

A group of students of agricultural engineering discipline along with one faculty member visiting PAU Ludhiana, visited CIPHET Ludhiana on March 4, 2009. They were explained institute activities and shown the facilities of laboratories and pilot plants.



**Russian delegation visiting CIPHET on March 4, 2009**

### **Trainings on Post Harvest Technology for Rural Catchments**

Two training programs on Post Harvest Technology for Rural Catchments were organized during 16 March 2009 to 21 March 2009 and 26 March 2009 to 01 April 2009 for participants from Assam. The participants were sponsored by State Institute of Rural Development, Guwahati. Thirty participants attended the above training programs. The technologies developed by CIPHET, processing of cereals pulses and oilseeds, soybean,

chillies, fruits and vegetables, preparation of project profiles, technologies commercialized under AICRP on PHT were covered along-with practicals in institute laboratories. The visits to various laboratories, pilot plants and industry were also included in the training for benefit of the farmers.



**Trainees of Post Harvest Technology for Rural Catchments**

## **Participation in Kisan Mela**

CIPHET participated in the Kisan Mela organized by Punjab Agricultural University at Ludhiana on 19-03-2009. The CIPHET technologies were displayed during the Mela. Sh. M.P. Singh, Technical Officer and Sh. Jaswinder Singh Technical Assistant of CIPHET participated in the Mela and explained the technologies to various farmers.

## **Promotions**

1. Dr. P. Branwal has been promoted from Scientist to Scientist (SS) w.e.f. 15.11.07.
2. Er. D.D. Nangare has been promoted from Scientist to Scientist (SS) w.e.f. 09.10.07.

## **Farewell**

A farewell was given to Dr. R.K. Goyal, Principal Scientist on 28-03-2009, who has been relieved from the Institute on 05/02/2009 to join due to his selection as Head of Division at CIAE, Bhopal.

## **Upcoming Events**

- 1) ICAR sponsored Winter School on "**Quality assurance and shelf-life enhancement of fruits and vegetables through novel packaging technologies**" will be held at CIPHET, Ludhiana during September 25 to October 15, 2009. The Course Director is Dr. Deepak Raj Rai, Senior Scientist, Agricultural Structures & Environmental Control Division. You can contact him on Tel : 0161-2313123, 0161-2819934(R), 9417366034 (Cell), Fax: 0161-2308670, E-mail : [d\\_r\\_rai@yahoo.com](mailto:d_r_rai@yahoo.com), [drrai66@gmail.com](mailto:drrai66@gmail.com)

- 2) ICAR sponsored Winter School on “**Recent developments in post harvest processing and value addition to livestock produce**” will be held at CIPHET, Ludhiana during October 22– 11 November, 2009. The Course Director is Dr. K. Narsaiah, Senior Scientist (ASPE). You can contact him on Ph.: +91-161-2313124, 09417143925, Email: [knarsan@yahoo.com](mailto:knarsan@yahoo.com)
  
- 3) ICAR sponsored Winter School on “**Mathematical modeling and simulation of agricultural structure, process and product quality**” will be held at CIPHET, Ludhiana during September 3-23, 2009. The Course Director is Dr. Dilip Jain, Senior Scientist (TOT Division). You can contact him on Ph.: +91-161-2313122, 09216125933, Email: [jaindilip25@sify.com](mailto:jaindilip25@sify.com)

## Technology of the month

### Development of castor depodder and decorticator

Castor (*Ricinus communis*) is considered as one of the ancient (150 BC to 100 AD) non-edible but having high medicinal value crop containing 25 – 58 percent oil in different varieties. India ranks first in area and production in the World producing 8.70 mt from about 1 lakh acres. Other than grown wild, castor is cultivated mainly in Gujarat, Andhra Pradesh, Maharashtra and Karnataka. Although castor has industrial and medicinal uses, still it is a neglected crop due to the laborious processing operations involved.

Currently castor seeds are manually depodded. After harvesting, the castor pods are sun dried for 3 – 12 days, depending on the initial moisture content and weather conditions. The husk is then removed from the seeds by beating with a mallet so as to release the seeds. The manual depodding process presently followed is tedious, highly time and labour consuming. Looking into socio economical conditions of farmers, a castor depodding and decortivating machine was developed at CIPHET which separates seeds from pods and dehulled from seeds by using principle of impact. The unit also contains a cleaning grading assembly which grades the seed in two sizes. The depodding and decortivating efficiency was found to be 98.5 % at 6.22 % (w.b.) moisture content of the pods. At the same moisture content the capacity was also as high as 179 kg/h. Overall dimension of the machine was 1255 x 625 x 1595 mm. Single person can conveniently operate the machine. The fabrication cost of the machine was Rs.25,000/- excluding cost of 2 hp electric motor. The operating cost of the machine was Rs.0.65 per quintal of castor pods for 8 h per day operation.



**CIPHET developed castor pod decorticator**

## Publication of the month

 <p><b>वार्षिक प्रतिवेदन ANNUAL REPORT 2007-08</b></p> <p><b>AICRP on A/P/A</b></p> <p>अभिल भारतीय समन्वित अनुसंधान परिषद कृषि में प्लास्टिक का अनुप्रयोग <b>All India Coordinated Research Project on Application of Plastics in Agriculture</b> भारतीय कृषि अनुसंधान परिषद का प्रादेशिक संस्थान <b>Central Institute of Post Harvest Engineering and Technology</b> आर.ए.पी.ए.ए. लुधियाना-141 004 (Punjab) PO, PAU, Ludhiana, 141 004 (Punjab)</p>	 <p><b>CIPHET NEWS</b> October to December, 2008</p> <p><i>From The Director's Desk...</i></p> <p>The thirty seven (37) pages of the 2007/08 annual and bi-monthly newsletter of CIPHET, Ludhiana, Punjab, India, is a tribute to the Ministry of Agricultural and Fisheries, Government of Punjab, India, for its support and funding of the project on 'Development of Post-Harvest Engineering and Technology for Inland Fish for Middle Level Farmers'. The newsletter is published quarterly by the Institute of Post-Harvest Engineering and Technology, Ludhiana, Punjab, India, during the month of October, November, and December. The newsletter is available in Hindi and English. The newsletter is available in Hindi and English. The newsletter is available in Hindi and English.</p> <p><b>IN THIS ISSUE</b></p> <ul style="list-style-type: none"> <li>• Director's Message</li> <li>• Research Bulletin</li> <li>• AICRP</li> <li>• Progress Report</li> <li>• IPR</li> <li>• Paper/Abstract/Proceeding</li> <li>• Short Report</li> <li>• Progress Report</li> <li>• Notice</li> </ul> <p>General Institute of Post Harvest Engineering &amp; Technology, Ludhiana, (Punjab)</p>
<p><b>Annual Report of AICRP on Plastics in Agriculture at CIPHET, Ludhiana</b></p>	<p><b>CIPHET Quarterly Newsletter (October to December, 2008)</b></p>

 <p>Technical Bulletin no. CIPHET/TH/01/2008</p> <p><b>Post-Harvest Handling of Inland Fish for Middle Level Farmers</b></p> <p>Dilip Jain Hardial Singh</p> <p>Central Institute of Post-Harvest Engineering and Technology Indian Council of Agricultural Research PAU Campus, Ludhiana - 141 004</p>	<p><b>Technical bulletin on Post harvest handling of inland fish for Middle level farmers</b></p>
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