



# Central Institute of Post Harvest Engineering and Technology, Ludhiana

Our Slogan: Produce, Process and Prosper

**CIPHET E – Newsletter for September 2006**  
Vol. I No. 3

## Events:

### 1. CIPHET celebrates National Nutrition Week:

The Institute celebrated National Nutrition Week during September 1-7, 2006. The main objective was to make youth and children aware about the effect of nutrition on their health. Students from local schools namely, G.R.D. Academy, Partap Public School, Sacred Heart Convent School and Sacred Heart Senior Secondary School were invited to the institute. Dr (Ms) Mridula D. scientist delivered lecture on importance of food nutrition and selection of correct foods. The school children were advised to avoid junk foods and eat balanced. The school children were also celebrated at Abohar center of Institute. The children mainly from the class 10-12 were shown around the research prototypes and laboratory instruments and were given refreshments including the value added products developed at the institute such as guava bar, aonla candy, sorghum-soy fortified biscuits, ber preserves and pomogranate anardana.



The students writing the nutrition quiz and being explained about CIPHET research activities

### 2. CIPHET participates in XI plan preparation of various institutions

Dr. S.N. Jha, Sr. Scientist, attended a regional consultation meeting on vocational education and training VET (Northern Region) held at NITTTR, Chandigarh on 08-09-2006. Programmes of VET were discussed. New courses to be added were deliberated. One course on value addition and entrepreneurship development for agribusiness was included for future programme. He also attended a one-day seminar conducted in Hindi on 26-09-2006 and presented an invited paper on nondestructive methods of quality

evaluation for fruits and vegetables at CSIO, Chandigarh. A possible collaboration between CSIO, Chandigarh and CIPHET, Ludhiana for collaborative research was also discussed. Director, CIPHET attended a meeting on September 15<sup>th</sup> for **Sub-Group on fruits and vegetables products, beer and wine** at Ministry of Food Processing Industries, New Delhi to discuss thrust areas on fruits and vegetables processing in XI plan to be taken up by MFPI.

### **3. Institute celebrated Hindi Pakhwara**

As tradition, CIPHET celebrated hindi pakhwara to popularize use of hindi among its employees during September 14-28, 2006. the programmes included were debate, essay competition, scientific poster preparation, typing skills, seminar, quiz and translation in Hindi. All the employees of the institute participated in the activities enthusiastically and best three among them awarded cash prize as well as mementoes.

### **4. CIPHET scientist participates in Conference on Mustard**

Dr. S. K. Tyagi participated in conference on Current Scenario of rapeseed and Mustard in India at Jaipur on September 30, 2006. Various aspect of mustard oil viz. dimensions of development, processing and storage of repressed mustard, cancer prevention, feeding mustard cake to livestock for better growth and milk production, marketing scenario of mustard oil in India, health and nutritional aspects of mustard oil with more emphasis, on life style and cardiac diseases were discussed. As per Dr. Manchanda, Retd. Head of Cardiology, Department AIIMS, New Delhi, there are 71% less chance for heart attack if crude Khachi Ghani mustard oil is used because it has very low SFA (Saturated Fatty Acid) 8% high MUFA (Mono Unsaturated Fatty Acid) 70%, high omega 3 fatty Acid (9-15%) ideal n-6: n-3 ratio, protein 30% and energy 490 cal/mg. It is the ideal cooking oil after olive oil, which is very costly and deficient in w-3 content (fish oil is required as a supplement for the people using olive oil). As per Dr. M.S. Ganesh a renowned cancer surgeon, mustard oil is rich in zinc and selenium and micro nutrient which are anticancer agent. Two teaspoon full of mustard oil containing 15% selenium, 12% tryphyto phenol, 9% omega fatty acid with 8% dietary fibre and 4% zinc. Mustard oil is equipped with AIT (Allyl Iso thiocynote), which is anti carcinogenic agent, which acts as a programmer of dead cells.

Various other issues of product diversification and value addition were discussed in this conference. CIPHET has already filed two patents viz. "A new technique for processing of the mustard seed for reducing refining cost and improving quality of oil" and "Use of by product of mustard seed haring anti bacterial & anti fungal mosquito repellent properties".

### **5. CIPHET scientist attends Summer School on Extension & Communication Management**

Dr. MS .Meena, Scientist attended an ICAR Sponsored Summer School on **Extension & Communication Management** conducted by Department of Home Science Extension Education from August 18 to Sept.7, 2006 at Chaudhary Charan Singh Haryana Agricultural University, Hisar. It consisted lectures, demonstrations, discussions and practical exercises based on latest developments in extension and

communication management. He learnt many skills during the summer school and also prepared a video film on Krishi Vigyan Kendra and its Training Facilities. The knowledge gained is being put in to practice in a project on preparation of video film showing training and entrepreneurship opportunities at CIPHET, Ludhiana

#### **6. Director CIPHET visits Marathwada Agricultural University, Parbhani**

Dr. RT Patil delivered a special lecture on Extrusion processing for value added products at valedictory function of ICAR short course on **Application of extrusion cooking for designer foods” at College of Food Technology, MAU, Parbhani** and also delivered a inaugural key note address on **“Post harvest management of fruits and vegetables-An overview”** at CAET, MAU, Parbhani for ICAR short course on **Post harvest management of fresh fruits and vegetables and its export**. Both the courses were conducted at MPAU Parbhani to increase value addition and post harvest activity of grains, fruits and vegetables.

#### **7. Institute participated in Kisan Mela:**

The institute participated in Kisan Mela on September 20 – 21, 2006. The Kisan Mela was organized by Punjab Agricultural University, Ludhiana. Mobile agro processing unit, posters on technologies developed by the institute, products (high protein high fibre biscuits, ground spices, besan, dal, guava bars etc.) and institute publications were displayed. The farmers look keen interest in mobile agro-processing unit. Few entrepreneurs also visited us and expressed their keen interest in fruit bars, porous bricks and training for soy-milk processing. The participation in the mela was very successful and is expected to spread awareness about CIPHET.



Farmers visiting CIPHET Stall



CIPHET Mobile Agro Processing Centre

#### **8. Assam Farmers visit CIPHET:**

Five entrepreneurs/farmers of Assam and Meghalaya visited CIPHET, Ludhiana and Abohar along with Dr. N.K. Mohan, RPC, SFAC Guwahati on 7<sup>th</sup> & 8<sup>th</sup> Sept 2006 to get exposure in the fields of (1) Grading, waxing and packaging of Oranges (2) Juice extraction from Orange, Pineapples (3) Dehydration and processing of Ginger and Cashew nut Facility available at CIPHET Ludhiana & Abohar. They were explained

about these activities by Dr. D.M. Kadam & Dr. D.B. Singh and their queries were answered in detail.

On 30<sup>th</sup> Sept, 2006 Dr. K. Kalita Director, SIRD, Assam along with his two senior officer visited CIPHET to discuss different aspect relating to Agro-Processing, Post-Harvest Technology and allied matter. Officer proposed to depute entrepreneurs assisted under Govt. projects for undergoing training on Agro processing, PHT at CIPHET Ludhiana as per CIPHET EDP (Entrepreneurship Development Programme) as well their own requirement on request.

#### **9. Undergraduate Students visit CIPHET:**

About 55 (35boys & 20 girls) students from Adhiparasakthi Agricultural College (APAC), Kalvani, TNAU, (TN) visited CIPHET on 26/9/06 as part of their study trip. They were exposed to different laboratories and facilities of the institute.

#### **10. Institute organized One-day Seminar at Abohar:**

Horticultural Crop Processing Division, Abohar organized one day seminar on “Production and processing of medicinal plant and pomegranate” on 18<sup>th</sup> September 2006 with broad aim to create an awareness about the scope of these crops under arid and semi arid ecosystem. About 100 participants including orchardists, entrepreneurs, processors and horticultural officers attended the seminar. Sh. Surender Kumar Jakhar, Chairman IFFCO was the chief guest.

The programme started with inaugural address by Dr. R.T. Patil Director CIPHET, who spoke about the institute and its mandate. Dr. Patil gave a brief description about the achievements and further programme of the institute to strengthen the post harvest aspect and minimize the post harvest losses of fruits and vegetables by adopting scientific and safe harvesting techniques, effective and economical sorting, grading, packing and storage of fresh fruit and vegetables and value addition by processing of this produce for value added products. He also gave emphasis on cultivation and processing of medicinal plants and pomogranate for crop diversification in Punjab and to meet the requirement of globalization, where India can play an important role in the world.

The chief guest in his address appreciated the role of CIPHET in developing the technologies, which are suitable to small holders, entrepreneurs and small-scale industries in the region, particularly at rural catchments. In technical session two lectures were organized namely **Scope and Prospectus of Medicinal Plants by Dr. Rajbir Singh Sr. Scientist** and **Production and Processing of Pomegranate by Dr. Desh Beer Singh, Sr. Scientist and Incharge, CIPHET, Abohar.**

An exhibition cum display was also organized for pomegranate fruits of suitable varieties for processing like Mridula, Ganesh etc and products like jelly, granadine, anardana, anardana powder, anardana tablets, rind powder, ready to mix chatney and common medicinal plants and their parts was also organized. Visitors and participants visited the stall and interacted with concerned scientists.



Chief Guest Shri Surendra Jhakar, Chairman, IFFCO visiting the stall

### 11. Director CIPHET visits Serbia and Montenegro

The Director CIPHET and Dr. S. N. Pandey ADG (Horti) visited as a GOI delegation to make on the spot assessment of areas of cooperation in the field of agriculture between India and Serbia during September 28 to October 2, 2006. Serbia being part of erstwhile Yugoslavia, it had infrastructure for very specific research and few crops as their research requirement were met from other parts of the union. Due to independence, they now feel lack of comprehensive research capability and hence India can contribute substantially to develop their agricultural research programme so that issues related to all-important crops can be attended to. Team identified the areas of cooperation and institutions in Serbia for future collaboration. The efforts will in improving the agricultural research and strengthen the friendship between both the countries.



Director CIPHET visiting virgin cold pressed sunflower oil expression unit in Serbia



Meeting of Indian delegation with hon'ble Minister of Agriculture, Govt. of Serbia (R-L; Dr. Patil, Hon'ble Minister, Dr. S.N.Pandey, ADG, Hort. and Mr. N.R.Singh, Second Secretary, Embassy of India in Serbia

#### Announcement 1

The CIPHET is planning to hold one-day institute-industry interface to commercialize the technologies developed by the scientists in the third week of November 2006. The CIPHET has more than 21 technologies to offer on this occasion. The exact date for the event will be communicated shortly.

## Technology of the month

### Pomegranate: its Products:

Pomegranate is one of the favourite fruits of tropical and subtropical regions where it has enjoyed the consumer's patronage for its healthy dietic and medicinal properties. India is world's leading producing country of pomegranate. Approximately about 52,755 ha area is cultivated under pomegranate producing 4,84,848 tones of fruit annually. The fruit is consumed fresh or it can be processed into juice, jelly, jams, wine etc. Owing to restricted period of availability and high perishability of fruits, value addition through processing would be an effective tool for economic utilization of increased production of pomegranate fruits in future.

The following technologies are developed at CIPHET for processing of pomegranate into various values added products.



### Processing of wild pomegranate into *anardana* and its powder

#### i. Anardana and its powder

Pomegranate is found to have desirable acid sugar blend and rich in minerals like Zn, Fe, Cu and Mn.

Cabinet drying at 55C for 7 hours of the arils are best for getting quality anardana and its powder of 0.190 mm size particle, retains maximum quality parameters and desirable colour value of L, a and b index up to six months when stored in 200 gauge LDPE bags. Wild genotype and Mridula cultivar of pomegranate were found to give quality rind powder with maximum yield recovery.

#### ii. Rind Powder

Rind powder of pomegranate having nutritional, medicinal and industrial use, dried and packed at CIPHET, retained maximum TSS, acidity, beta- carotene, ascorbic acid and minerals like Ca, Mn, Zn and Fe when stored at ambient temperature for 6 months packed in 100 gauge LPDE bags.

#### iii. Anardana ready to mix chutney

Anardana instinct ready to mix chatney developed at CIPHET, Abohar when packed in 200 gauge PLPE pouches retains freshness and quality for 6 months when stored in refrigeration conditions.

#### iv. Anardana tablets (Hazmahazam)

Anardana tablets when prepared with desired formulation developed at CIPHET, has better taste, flavour and binding characteristics and can be stored for 6 months at room temperature when packed in 200 gauge metalized polyester polyethylene pouches.

#### v. Pomegranate jelly

Pomegranate jelly prepared from combination of juice sugar 1:1 with citric acid as preservative has better quality, colour, flavour and acceptance.

#### vi. Granadine

Pomegranate granadine made from combination of juice sugar blend of 60:40 having 70.0:0.92 sugar acid ratio was better in taste, flavour and acceptance.

## Project Profile of the Month - Milling of Mustard Oil

### PROCESS:

Traditional oil extraction equipment of India is bullock drawn *Ghani* which leaves 10-15 % oil with cake. Mechanical power *ghanis* are now being used which leave 8-12% oil with cake. However, most of the commercial oil extraction by mechanical means is done by expellers. Mechanical expellers leave 6-7% oil with cake under good management.

Mustard oil is expressed mechanically in commercially available oil expellers. The seed is expressed thrice in mechanical expeller to extract maximum amount of oil. The moisture content of the seeds should be 7-8% (wb) and no cooking is required before oil expression. The expressed oil is filtered in a filter press, in which the filtration of oil is done through a cotton canvass cloth. The filtered oil is filled into containers, which are subsequently sealed & labelled, for marketing. On an average 33 to 35 per cent of oil is obtained from the seeds (on weight basis). The recovery of oil from the seed is dependent on the quality of the seeds. The cake obtained is used as cattle feed and also fetches remunerative price. The oil expeller and the filter press need regular maintenance for successful operation of the machinery. The project does not create any pollution as the main product (oil) and the by-product (oil cake) is consumed by humans and cattle.

### BENEFIT-COST ANALYSIS

The benefit cost analysis of the project has been done for two different cases of operation of the project. These two cases are:

- I. Procurement sale basis.
- II. Procurement sale basis and custom hiring.

The assumptions for calculations are as under:

- Land and building will be obtained on rent.
- Average capacity of oil expeller / filtration unit: 30 kg/h (75 % of the rated capacity)
- Recovery: 32 % oil and 66 % cake.
- Monthly repair and maintenance charges: 1 % of the cost of machines.
- Depreciation on machines and equipment: 10 % p.a.
- Depreciation on furniture and tools: 20 % p.a.
- Rate of interest: 11% p.a.
- No. of working days in a month: 25
- Total no. of working days in year: 300
- Working hours per day: 8
- Capacity utilization: 1st year 50%; 2nd year 60%; 3rd year 70%;  
4th year 80 %; 5th & subsequent years 90%.

The detailed calculations for first case is presented as under:

## Total Capital Investment

(i) Fixed capital	Rs. 1,00,600
(ii) Working capital for 1.5 months	Rs. 1,65,450
<b>Total</b>	<b>Rs. 2,66,050</b>

**Cost of Production / Annual Cost including total working capital, Depreciation on m/c's & equipment (10% p.a.)**

**Total Rs. 13,62,265**

**Depreciation on office furniture & tools (20% p.a.)**

**Interest on total capital investment @ 11 % p.a.**

## Total Sales (per annum)

**Total sales Rs. 14,86,080**

<b>Mustard oil (32% recovery)</b>	<b>23040 kg @ 48/kg</b>
<b>Cake (66%)</b>	<b>47520 kg @ 8/kg</b>

## Profitability (per annum)

Return on capital investment = 46.54 %

## Break Even Point (B.E.P.) Case I

B.E.P (capacity) = Total fixed cost / (Unit price - Avg. variable cost)

$$= 105865 / (20.64 - 17.45) = 33186 \text{ kg or } 46.09\%$$

## MACHINERY AND EQUIPMENT SUPPLIERS:

1 Allied Expeller Industries XXI-11810-11, S.A.S. Nagar St. No. 2, Ludhiana – 141 003	2 Ajay Expeller Works St. No. 6, Vishwakarma City Ludhiana
3 Chandan Expeller Industries 81, Industrial Area – B, Ludhiana	4 Dimple Expeller Industries Benepal Complex , 832 – 833, Industrial Area – B Ludhiana – 141 003 (Punjab)
5 Guru Teg Engineering Co. G.T. Road, Miller Ganj Near Fire Brigade , Ludhiana – 141 003	6 Hero Expeller Co. 11786, S.A.S. Nagar, Street No. 3, Ludhiana – 141 003
7 India Expeller Industries Nirankari Street No. 3 Miller Ganj Ludhiana – 141 003	8 Jwala Expeller Industries C- 105, Industrial Estate Ludhiana – 141 003
9 Jindal Expeller Industries G.T. Road, Miller Ganj Ludhiana – 141 003	10 Krishna Expeller Industries 158-B, Industrial Estate, Miller Ganj Ludhiana – 141 003 9 (Punjab)

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## **Forth Coming Conferences and Symposiums related to Post Harvest Technology**

1. Indian Society of Agricultural Engineers will organize XLI ISAE Annual Convention and Symposium during January 29-31 at Junagadh Agricultural University, Junagadh (Gujrat). For further details see website: [www.isae.in](http://www.isae.in)
2. Centre for Energy Studies, Indian Institute of Technology, Delhi will host a "3<sup>rd</sup> International Conference on Solar Radiation and Day Lighting, SOLARIS 2007". The conference is scheduled to be held from 7 to 9 February, 2007 at the Indian Institute of Technology Delhi (IITD) – a premier center of excellence for research and development in Science, Engineering and Technology of the country – situated at Hauz Khas in South Delhi. The theme of "Solaris 2007" is *Solar Radiation: Key to Climate Control, Day Lighting and Agriculture*. For further details see website: [www.iitd.ac.in/events/solaris07](http://www.iitd.ac.in/events/solaris07)
3. The Association of Food Scientists and Technologists (I) will be organizing 18<sup>th</sup> Indian Convention of Food Scientists and Technologists (ICFOST-2006) at Hyderabad during Nov 16-17, 2006. For further details see website: [www.afsti.org/Icfost](http://www.afsti.org/Icfost)
4. The 5th Asia-Pacific Drying Conference (ADC07) will be held during 13-15 August 2007 at Hong Kong, China. The papers are invited in following areas: - Energy consumption in drying; Green drying technologies, - Ecological aspects of drying, - Quality of dried products, - New constructions of dryers, - Alternative technologies for drying, - Role of drying in biotechnology, - Role of drying in nanotechnology. For further details see website: <http://serve.me.nus.edu.sg/arun/file/confer/ADC07-First-Announcement.pdf>
5. International Conference on Agricultural, Food and Biological Engineering and Post Harvest/Production Technology will be held in Khon Kaen, Thailand, January 21-24, 2007. The conference will be hosted by the Thai Society of Agricultural Engineering and the Faculty of Engineering, Khon Kaen University, endorsed and co-sponsored by the American Society of Agricultural and Biological Engineers. For further details see website: [www.asabe.org](http://www.asabe.org)

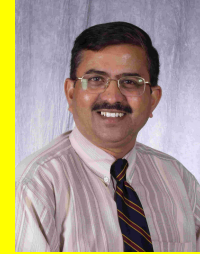
### **Announcement 2**

CIPHET is going to organize technology based entrepreneurship development programme on following topics:

1. Modern pulse milling – Nov' 27-Dec' 1, 2006
2. Surface covered cultivation for high value crops- Feb' 5-9, 2007
3. Production of tomato puree and powder on commercial scale March 5-10, 2007, March 26-31, 2007 and April 16-21, 2007

The course fee for the programme will be Rs 2000 per participant (lodging and boarding extra)

## Director's Column



Dear All,

This month's E news letter includes the technology for value added pomegranate products and project profile for mustard oil. Pomegranate is a nutritious fruit having great scope for indigenous as well as export market. Pomegranate is known for its healthy dietetic and medicinal properties. The low price of fruit during glut and lot of losses due to cracking of fruit and availability of sour type wild pomegranate in abundance in Himalayas provides ample scope for processing. CIPHET has developed a comprehensive post harvest management package for this fruit to meet the future need of pomegranate growers who are considering pomegranate as diversification to present day orchards of kinnow and cash crop of cotton. The medicinal crops also offers great scope as potential diversification crop for Punjab. The response of progressive farmers in large number proved timeliness of one day seminar organized by CIPHET for on these crops.

Indian agricultural research experience is a unique even to western world and we can help newer countries like Serbia to strengthen their agriculture research to make it more comprehensive like our ICAR institutes. The collaboration will of course be of mutual benefit and help foster the friendship between both countries. With this objective I and Dr. SN Pandey visited Serbia in the last week of September 2006.

CIPHET is also actively participating in the XI plan formulations of other institutions like Ministry of Food Processing Industries, Institutes of technical and vocational education in Ministry of Human Resource Development so that value addition and post harvest management receives greater attention in the XI plan.

Wishing you all a very happy festive season of Dipawali and Ramzan.

**R.T. Patil**  
**Director**

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