



Central Institute of Post Harvest Engineering & Technology Ludhiana

OUR SLOGAN: PRODUCE, PROCESS AND PROSPER

**CIPHET E – Newsletter for December, 2009
Vol. 4 No. 12**

Director's Column



Dear All,

CIPHET is making efforts to interact with all stakeholders to promote production catchment processing. One of the important agencies responsible for this is the All India Food Processors' Association (AIFPA). On the occasion of their 65th AGM a presentation was made from CIPHET on "Innovations in Post Harvest Management Techniques and Equipment Appropriate to Production Catchments in India". The response from the stakeholders was very positive with appreciation to CIPHET's work on developing processes and equipment and approach in promoting it for establishing micro enterprises in production catchments.

The ethnic fruits are strength of our country. They not only are sustenance crops for the tribal population but lately are catching the attention of modern world due to their unique health benefits. The efforts of Dr. BSKKV Dapoli are commendable in modernizing the value chain for Kokam, Karonda, Jamun and Jackfruit with support from NAIP. These crops if properly handled and processed can increase the profitability of farmer many folds.

The importance of mechanization in all sectors including the post harvest management and value addition is a key to prosperity of the framers. Hence to solve some of the problems of animal and fisheries sector related to mechanization an interaction meeting was called at CIAE Bhopal as per the initiative from DDG Engineering. Both CIPHET and CIAE scientists interacted with scientists from this sector tried to prioritize the problems on which immediate attention is required. On similar lines two days interaction meeting on "Tools and Machinery for Development of Horticulture" was held at CPCRI, Kasargod during 18-19 December 2009. The meeting was aimed to identify the tools and machinery required for mechanization of different cultural and primary processing operations of horticultural and plantation crops. The problems like Banana-Dehander, Peeling, destoning and MAP for Litchi, Vermi compost preparation tools and machinery and Processing and packaging of mushroom were identified for CIPHET in collaboration with respective ICAR institutes.

We are very happy that state of Bihar is very aggressively pursuing the agenda of food processing at micro level. Hence during this month itself we had two batches of farmers visiting CIPHET to learn about various techniques in food processing which they can follow at SHG level or individual enterprise level. Our past trainees from Bihar are very successfully processing the green chilli powder and powdered ginger and marketing it.

The Agro Processing Centre at village level is novel concept given by our AICRP on PHT. It is more relevant now with the importance of food traceability in food safety. Hence model training programme was conducted at CIPHET to sensitize the higher officials in the state government on this topic. Another unique development at CIPHET was licensing the meat processing technology developed at CIPHET to entrepreneurs from Pune and conducting first of its kind entrepreneurship development programme for participants representing farmers, entrepreneurs from Punjab and Maharashtra

In this newsletter we are flashing the importance of Home Scale Processing of Flax for Nutraceuticals Use. Flaxseed has functional compounds like -alpha linolenic acid (ALA), lignans and fibre. Flaxseed consumption exhibits potential health benefits that include reducing the risk of cardiovascular diseases, cancer and diabetes. The simple methods suggested for using of flax seed in daily diet will be useful in keeping all of us healthy.

With best regards

**R.T. Patil
Director**

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AGM of All India Food Processors Association and national Seminar

The All India Food Processors' Association (AIFPA) held its 65th AGM-2008-09 and Annual Conference on Saturday the 19th December 2009 at Bangalore- 560001. On this occasion a National Seminar on "Horticulture Based Food Processing Industry-Trends and Prospects" was also being organized with the support of Ministry of Food Processing Industries, Government of India.

The key issues discussed in the seminar were as follows:

- (i) Challenges in the availability of processable varieties of horticulture produce and development of new varieties.
- (ii) Importance of Good Agricultural Practices (GAP).
- (iii) Backward Linkages by Food Processing Industry including contract farming and similar models.
- (iv) Problems and challenges faced by Mango Processors.
- (v) Need for up-gradation of Process Technology, Plant & Machinery in respect of Horticulture Based Food Processing Industry.
- (vi) Quality assurance of processed fruits and vegetables products-GMP, GHP and HACCP Certification.
- (viii) Developments in freezing technology for IQF foods.
- (ix) Transforming waste from F&V processing industries into environmental and economic advantage.
- (x) Prospects for developing export of processed food products.
- (xi) Emerging Technologies for the processing of fruits and vegetables.

Dr D N Yadav, Sr Scientist from CIPHET represented CIPHET in this meeting and presented a paper entitled "Innovations in Post Harvest Management Techniques and Equipment Appropriate to Production Catchments in India".

Indian Convention of Food Scientist and Technologist-2009

Surveys on food consumption pattern reveal that the total energy intake does not meet the daily requirement in a majority of population due to inadequate consumption of foods, such as pulses, fats and oils. The intake of green leafy vegetables; milk and milk products; fats and oils in most districts of India was less than RDA. Child and maternal malnutrition continues to remain a predominant nutritional problem. Malnutrition is common in the elderly population due to consumption of diets deficient in macro and micronutrients. The life style disorders such as coronary artery disease, obesity and diabetes are receiving increased attention. Food processing industries need to be sensitized regarding the challenges of providing food products with less calorie density than with those of high nutrient density. Appropriate combinations of macro and micronutrients, with inclusion of conventional and novel health boosting ingredients, like dietary fiber, probiotics, antioxidants, omega-3 fatty acids, flavonoids, phytosterols etc. to deliver specific health benefits need to be formulated. Hence systematic studies should explore the effect of such nutrient/health supplements on different segments of low-income groups in the country.

In view of these challenges, AFST (I) organized the convention at Bangalore during Dec 21-23, 2009 on the focal theme "Specialized Processed Foods for Health & Nutrition: Technology and Delivery" for exploring all possible avenues to find meaningful solutions.

Dr. R. T. Patil attended this convention as Vice President AFST(I) and also chaired a session on invitational lectures where Dr. Nawab Ali, Former DDG (Engg) and Dr. Syed Rizvi, Prof. Food Science, Cornell University made the invitational presentations. Dr. DN Yadav Sr. Scientists from CIPHET presented a research paper entitled “Effect of particle size and level of defatted rice bran on chapatti making quality of wheat flour”.

Processing of Important Ethnic Fruits of India

Director CIPHET was a Chief Guest at NAIP launching workshop on “A Value Chain for Kokum, Karonda, Jamun and Jackfruit” held on 7th December, 2009 at Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. The Kokum, Karonda, Jamun and Jackfruit are important ethnic fruits of India and they are grown mostly on the western coast from Maharashtra to Kerala. These fruits possess many medicinal properties. Kokum is mostly used in the form of dried rind to give acid flavour to curries and the fresh fruit juice for preparing cooling syrups and curry. Karonda fruits are sour and astringent in taste and are richest source of iron. It also contains good amount of vitamin C. Fruits are very useful to cure anemia. The fruits have antiscorbutic properties. Jamun fruit is a good source of iron and is also known to have therapeutic value as it prevents diabetes and help in its control. Jackfruit is one of the neglected fruit crop though it possess high nutritive value. Fruits are eaten raw when ripe or they are processed. Unripe fruits are used as vegetables. The pulp of ripe Jackfruit is rich in vitamin A, carbohydrates and minerals. However due to lack of proper post harvest handling and management the losses are very high. The traditionally processed products available from these crops have great demand. However, in spite of good demand due to lack of standardization of the process and suitable small scale equipment for value addition the farmers are not getting proper return. Hence, this project was approved by NAIP, with following objectives:

- To standardize the procedures for existing traditional processing methods for Syrup, Agal, and Amsul making from Kokum; powder from Jamun seed; and unripe jackfruit bulb chips and ripe jackfruit leather.
- Develop the different processed products from candidate fruit crops and their byproducts.
- Extraction of valuable food components from kokum and Jamun fruit such as Hydroxy citric acid (HCA) and natural food colour.
- Studies on storage and packaging of processed products and by-products of the candidate fruit crops.
- Training of standardized procedures and technologies to the SHGs, small-scale food processors and Entrepreneurs.
- Training of developed value added technologies to the Entrepreneurs.
- Training on new processing techniques and products to different Government Officers dealing with SHGs and Entrepreneurs.

The PI of the project is Dr. Nayansingh J. Thakor, Professor & Head, Dept. of Agricultural Process Engineering, (BSKKV), Dapoli. The project was inaugurated in the presence of Dr. Vijay Mehta, Vice-Chancellor, BSJKKV, Dapoli. Dr. A.G. Pawar, Director (Extn. Edu.), Dr. R.K. Goyal, National Coordinator (NAIP) and Nodal Officer (NAIP) of BSJKKV, Dapoli.



Releasing of information brochure during launching of the project.

(R to L: Dr. Thakor, PI, Dr. Goyal, National Coordinator, Dr. RT Patil, Director CIPHET and Chief Guest and Dr. SD Sawant, Chairman of the CAC of the project)

Tools and Machinery for Development of Horticulture

Two days interaction meeting on “Tools and Machinery for Development of Horticulture” was held at CPCRI, Kasargod during 18-19 December 2009. The meeting was aimed to identify the tools and machinery required for mechanization of different cultural and primary processing operations of horticultural and plantation crops. Eighteen Institutes of Horticulture Division of ICAR and two engineering institutes (CIPHET, Ludhiana and CIAE, Bhopal) participated in the meeting. Er. R.K. Vishwakarma, Scientist (SS), CIPHET, Abohar represented CIPHET Ludhiana. The meeting was inaugurated by Dr. H.P. Singh, DDG (Hort.) as Chief Guest. The inaugural session was presided over by Dr. M.M. Pandey, DDG (Engg.).

In the technical session under chairmanship of Dr. P. Chandra, Director, CIAE, Bhopal, the proceedings of the previous meeting held at CISH, Lucknow on January 18, 2008 were presented and discussed. Then the participating centres presented their problems in mechanization of horticulture and the problems were prioritized. The group of Institutes to work for development of tools and user institute were identified. It was decided in meeting that CIPHET, Ludhiana/ Abohar would work on following problems in association with the user Institutes as given below.

1. Banana-Dehander with NRC, Banana, Trichi
2. Peeling, destoning and MAP for Litchi with NRC, Litchi
3. Vermi compost preparation tools and machinery with CARI, Port Blair
4. Processing and packaging of mushroom with NRC, Mushroom

Training on ‘Post-Harvest Technology for Rural Catchments’ for Bihar Farmers

Two training programmes on ‘Post-Harvest Technology for Rural Catchments’ were conducted at CIPHET, Ludhiana for 16 and 20 farmers from Bihar during 4-10 December 2009 and 14-20 December 2009 and were sponsored by ATMA Sheikhpura and ATMA Nalanda respectively. These programmes were coordinated by Dr. Sangeeta Chopra, Senior Scientist. The participants are engaged in growing wheat, paddy, mushrooms and potatoes in

the villages in Bihar. The training was given on processing of grains, pulses, oilseeds, fruits and vegetables including processing of soybean, aonla and guava through lectures and practicals. The know-how on minimal processing, packaging & storage of vegetables and cultivation of mushroom and vegetables was also disseminated.



Farmers from ATMA Sheikhpura

Model training programme for state government officials for Establishment of Agro Processing Center in Rural Catchments

A one week training programme on 'Establishment of Agro Processing Center in Rural Catchments for Processing and Value Addition activities' was organized from 30th November-7 December and was sponsored by Directorate of Extension, Department of Agriculture Government of India, to impart training to Agriculture Development Officers (ADO's) from various parts of the country. During the programme, ADO's, SAOs and Dy. Director of Agriculture from different states were imparted training on processing and value addition for Soyabean, processing and value additional technology for chillies, processing and value addition technology for oilseeds, applications of plastics in agriculture, extrusion technology for ready to eat products, processing technologies for groundnut, Minimal processing and MAP for vegetables, concept of agro processing center, processing and value addition technologies for meat and poultry, storage of fruits and vegetables and project profile preparation and marketing of agriculture produce.



Participants of Model Training Course organized at CIPHET

CIPHET unveils novel products at media meet

A media meet was organised by CIPHET on December 18, 2009. On this occasion Dr R.T Patil, Director, CIPHET, unveiled technologies for production of guava bars, green chilli powder, groundnut milk, mustard *saag* powder and ginger powder. Journalists from print and electronic media showed their presence on the occasion. During the media meet, Dr R.T Patil showcased various technologies developed by the CIPHET and discussed possibilities in food processing industry. He revealed that food processing industry had immense potential for creating employment. “Through value addition farmers can increase their income manifolds.” He emphasized that locally processed food should be promoted as this would help both consumers and indigenous industry. He urged media fraternity to give maximum possible coverage to agriculture sector for creating awareness among masses. Dr Deepak Raj Rai, Head of Transfer of Technology Division CIPHET, briefed about important role of CIPHET in NAIP Mass Media project through his presentation. On the occasion, farmer-turned-entrepreneur Bachittar Singh launched his groundnut based milk product, technology of which has been developed at CIPHET. Dr Jagdeep Saxena, Co-Principal Investigator of NAIP Mass Media project, also briefed the media. The meet was well attended by media from both print and electronic and provided interactive forum for scientists and media.

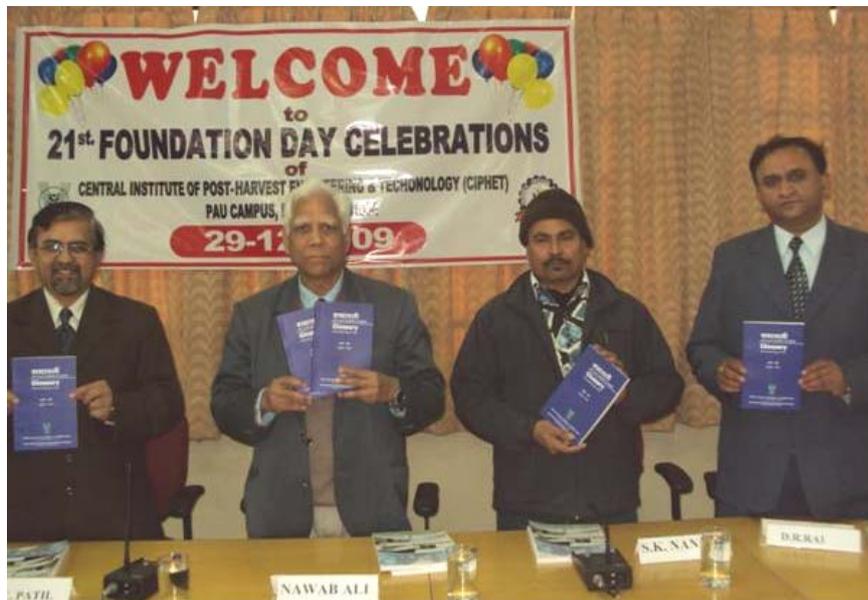


Display of Product Samples during Media Meet

CIPHET celebrated its foundation day

Central Institute of Post Harvest Engineering and Technology (CIPHET), celebrated its 21st foundation day on December 29, 2009. The institute was established in year 1989. Speaking on the occasion, Director CIPHET Dr R.T Patil said that in short span CIPHET made a mark in post harvest by developing new technologies. He said that CIPHET had recently developed technologies like pomegranate aril extractor, groundnut based milk, guava bars production and green chilli powder production having immense potential. Saying that post harvest is becoming most important area in agriculture, Dr Patil said that taking cue from CIPHET, Maharashtra and Rajasthan have recently set up their own state level institutions in post harvest. “Though production has increased manifolds in last few decades, but condition of farmers is more or less is the same,” he said, adding that their condition could only improve through value addition. Dr Nawab Ali, former Deputy Director General (Engg) ICAR, said that CIPHET should give emphasis on minimizing post harvest losses of nutrients during processing of food. On the occasion, Head Transfer of Technology Dr Deepak Raj Rai was conferred with best worker award in scientist men category and Senior Scientist Dr Sangeeta Chopra in women category for their achievements. Others got best worker award included Mr. V.K Sarahan and Mrs. Sonia Rani (technical category), Iqbal Singh and Jasvinder Kaur (administration category) and Shalik Gram Dwivedi (Supporting Staff). CIPHET Director R.T Patil also honored employees completing ten years of service with the institute. He also gave cheques amounting one thousand each for the children of employees/officials who performed well in their board exams.

Release of Glossary of English to Hindi Words for Post Harvest Engg. & Tech.



Marwar Krishi Utsav 2009 at Jodhpur

Recognizing the need for sustainable and balanced development of Agriculture sector and enabling widest dispersal of economic benefits to all, Confederation of Indian Industry (CII) along with Government of Rajasthan has organized Marwar Krishi Utsav 2009 on 8–9 December, 2009 at Rawan Ka Chabootara, Near Barkatullah Khan Stadium, Jodhpur, Rajasthan. National Institute of Agricultural Marketing (NIAM) was the Knowledge Partner for the activity. Dr Dilip Jain, Senior Scientist, CIPHET had participated as an expert of Post-Harvest Managements for bringing new techniques and ideas to the farmers through

presentation and Kisan paramarsh. Dr. Jain presented the various post-harvest technologies developed at CIPHET and management practices suitable for crops of desert region.

Livestock farmers trained in meat processing and products development

Meat and fish products are getting popular due to rising income and changing food habits and play an important role in meeting our daily nutritional requirements. Rapid urbanization and change in life style have increased demand for ready to eat products. The traditional sale of fresh meat is not very profitable as compared to the sale of value added meat products. Value addition through processing of meat into further processed meat products increases return from meat sale. Value added products attract a higher margin and often provide clever and profitable ways to sell secondary cuts, tough/spent meat which otherwise fetch low price in the market. Processed meat products provide tasty, convenience and designer foods to the meat consuming population. Therefore there is an ever increasing domestic consumer demand for good quality meat products.

However, high cost of these products makes it difficult for an average consumer to use these products regularly in their diet. Therefore development of technology for production of low-cost meat products is need of the hour. The major cost factors in meat products are the price of raw meat, ingredients and imported equipment. Hence the cost of production has to be brought down in order to make these products more affordable and popular among general public. This can be achieved by careful selection of ingredients, reformulation with unconventional food ingredients and using locally available equipment.

Keeping this in view CIPHET has developed a technology to address the problem on high cost of meat products. Here nutritious and tasty meat products can be developed utilizing locally manufactured equipment and low-cost formulation. To transfer these technologies to the small scale enterprises and make these enterprises prosperous and viable CIPHET Ludhiana conducted an Entrepreneurship Development Program during Dec 15-18 on “Development of Value Added Meat Products Using Simple Technologies”. This was the first of such kind of training program in the country available for the livestock and fishery farmers. Dr. Suresh K Devtakal Senior Scientist was the program co-coordinator and trained the farmers in hygienic handling of meat and fish, further processing and development of value added products. Different livestock farmers and entrepreneurs from Punjab and Maharashtra got hands on training on preparation of sausages, salamis, kebabs, fish fingers, blocks and meat pickles. Further participants got information on handling of different equipments, hygienic practices, packaging methods to preserve the meat products. Dr.R.T.Patil, Director CIPHET and Dr. Mahendra Kumar Sharda, Deputy Director ATMA, Ludhiana distributed certificates to the participants.



Participants preparing different processed meat products



Participants learning the fish dressing techniques.

CIPHET scientist attends annual conference of Association of Microbiologists of India (AMI)

The AMI is the largest academic society with 2900 life members and has collaboration with American Society of Microbiologists (ASM). Dr. H.S.Oberoi, Sr. Scientist (Microbiology) from CIPHET made an oral presentation as invited speaker on “Simultaneous saccharification and co-fermentation of kinnow (*Citrus reticulata*) waste for ethanol production using galactose adapted *Saccharomyces cerevisiae* and process optimization through response surface methodology”. The lecture was well received by the audience and as a follow up scientists from different Universities/ Institutes like University of Delhi, Osmania University, Hyderabad, Agarkar Institute and NCL, Pune expressed their desire to work with CIPHET on different aspects of biomass management.

Utilization of wastes from plantation crops for improving socio-economic status of farmers

CPCRI Kasaragod had organized a ICAR sponsored short course on “Utilization of wastes from plantation crops for improving soil health and fertility, crop production, post-harvest output and socio-economic status of farmers” during December 1-10, 2009. Since utilization of crop waste for post harvest output was one of the key words, CIPHET scientist Dr. H.S.Oberoi was invited to deliver two lectures during this course, one on “Production of industrially important enzymes using plantation crop residues - prospects and challenges”, and the other on “Ethanol production from plantation crop residues”. In both the presentations, utilization of coconut coir pith, coffee pulp and cocoa shell and tea waste for production of enzymes, ethanol and animal feed supplement were discussed. Dr. George V Thomas, Director, CPCRI expressed keen interest in working with CIPHET especially in the area of extraction of polyphenolics from coconut coir pith and use of the remaining material for enzyme production.

Study tour of Afghanistan delegation on Food Processing at CIPHET

Study tour for Afghanistan delegation comprising of 13 officers which includes 8 sponsored by UNFAO and 5 from German Technical Cooperation (GTZ/DETA) was organized at CIPHET Ludhiana as well as at CIPHET, Abohar during December 6-12, 2009 on various aspects of Food Processing. The emphasis of the visit was particularly to get the information about women entrepreneurs engaged in Food Processing activities in India and delegates were looking to replicates such models in Afghanistan to empowerment of rural women. During study tour, they visited Global Agro-Food Processing Unit, Ludhiana which is managed by Mrs. Gurdev Kaur a lady entrepreneur preparing various processed products like pickles, jam, spices etc. They also visited B.K. Soya Agro Products, Ludhiana and got the information about various soy based products from the entrepreneur. Further, they had a discussion with Ms. Jyoti Sharma, NGO, Rastriya Niskam Welfare Sewa Society for their organizational structures and products being made by the society and how they are engaging rural women workforce for such earning activities. During their visit to CIPHET, Abohar, the group visited some of the women entrepreneurs engaged in preparation of food products as well as other earning activities. They had detailed discussion with them about product development and marketing. The delegates have also visited few Kinnow orchards and have seen the picking of fruits which is mainly done by the farm women and managed by the women entrepreneurs. Besides, they have also seen the research and development facilities, pilot plants and orchards at CIPHET Ludhiana as well as CIPHET, Abohar followed by lectures on various aspects of Food Processing. Dr. R.K. Gupta, Head, HCP was the Visit Coordinator and Er. R.K. Vishwakarma was Co-coordinator.



Delegates viewing operation of CIPHET Kinnow grading and Waxing Plant



Delegates looking waxed Kinnow ready for packing



Delegates in the Conference Hall for lectures

Farmers' Participatory Action Research Programme in Champawat District of Uttarakhand

Plastic mulching is a proven technology to conserve soil water and it increases availability of soil water for plant growth and inhibit the growth of weeds. In hill areas main commercial crop is the vegetable production, during off season. Vegetables need adequate supply of irrigation water. But water scarcity for irrigation is a prominent problem at hilly areas. Hence demonstration of plastic mulching and food processing was carried out by CIPHET at five villages near Champawat, during Dec 5-12, 09. The selected villages were Talli-Madali, Murhiyani, Gumod, Patan-Patani and Dharoj.



At Talli-Madali village the programme was attended by 53 beneficiaries. Major crops of this village are onion, garlic, soybean, corn, wheat, ragi, brinjal, tomato, potato, cabbage,



cauliflower, leafy vegetables, spinach and coriander etc. Farmers are facing sucking pest problems in these crops. White grubs (*Holotrichea* spp.) are major constraint for tuber crops such as potato etc. On request of farming families, a detailed lecture on pest and disease infestation, reasons and various control measures was also arranged. Mulching demonstration was carried out in onion crop. Farmers were very much interested to do mulch in various transplanted crops to save irrigation water and control of weed germination. They were demonstrated preparation of apple jam, anola products, lemon and malta squash and tomato sauce. Similar programmes were held at Village-Murhiyani, Village-Gumod, Village Patan-Patani and Village Dharoj.



Farm women participating in Food Processing Demonstrations

Agricultural Marketing Summit 2009

This event was organized by the Confederation of Indian Industry (CII) in association with Ministry of Agriculture, GOI and the National Institute of Agricultural Marketing at New Delhi, during 16-17 December 2009 to discuss the issues related to Public Private Partnership for Inclusive Growth a key to sustainable Agriculture Marketing. Dr. R. T. Patil, Director, CIPHET and Dr. AK Dixit, Sr. Scientist (Ag. Economics) attended this event.

Mr. K V Thomas, Minister of State for Agriculture, GOI said that the farm sector that is very labour intensive should be reoriented to make it more vibrant and this can be done only through providing better marketing facilities, infrastructure facilities and creation of stronger backward and forward linkages. Setting the tone of the two-day deliberations on 'Public Private Partnerships for inclusive growth', he particularly emphasized on the need to bring accountability and transparency in the regulatory environment.

Mr. Rakesh Bharti Mittal, Chairman CII National Council on Agriculture remarked that the ultimate objective of all efforts is to ensure that the fruits of development reach the lowest stakeholders, the marginal and landless farmers. He further added that ensuring a level playing field for farmers by creating an atmosphere of competition among buyers, organizing farmers into formal and informal groups to meet requirement of volume and quality, capacity building for more efficient production and post harvest management with adequate credit facilities to farmers are some of the elements that requires attention in the Agri marketing reform process.

Speaking on “What are the Ideal Market Conditions and How We can Achieve the same in India”, Mr. Sharad Joshi, Member of Parliament, Rajya Sabha emphasized on the need for proper statutory minimum prices of sugar in India and illustrated a number of cases since 1974 about the changing position regarding the methods of price fixing. Mr. Joshi stressed on the need to establish a policy for reasonable price for both farmers and consumers and the need for a unified market.

Addressing the gathering Mr. Anurag Bhatnagar, Director General, NIAM, said that the Agri Marketing Summit 2009 is particularly important as it is being held at a time when change is all around us. It is just in order that the Summit brings together so many stakeholders and gives us an opportunity to take stock of the current reform process in Agricultural Marketing, related developments, the role and contribution of the Private Sector and the need to further strengthen farmer linkages with the supply chain.

During the course of deliberation following views were emerged

1. Need to formulate long term market policy by each state for attracting private sector investment.
2. Need to amend APMC act by those states who have not adopted model APMC (Development and regulation) Act 2003 on the following lines.
 - a. Removal of interstate barriers,
 - b. Abolition of licensing of Agricultural Marketing,
 - c. Regulators to be appointed
 - d. Abolishment of taxes at mandi level. It should not more than 0.5 per cent of the produce. However, the prevailing tax (direct and indirect) ranged from 10 to 15 percent.
 - e. Direct marketing through Self Help Groups (SHG), NGOs, Farmers Associations, Cooperatives, Joint ventures are encouraged by the government
3. Need to establish open and transparent price setting mechanism.
4. Market fee so collected should be invested for strengthening market infrastructure.
5. Direct income transfer policy is to be popularized as it is much better than to provide subsidy to fertilizer companies and sugar industries.
6. Credit availability for marketing and coverage under insurance.
7. Opportunities for Public Private Partnership are:
 - a. Terminal Market: Terminal Market Complex (TMC) can be set up in states, to provide direct marketing and permit setting up of markets in private and cooperative sectors. TMC will establish backward and forward linkages. Also ensure transparency in price fixation and competition. Examples: TMC Perundurai for Coimbatore Region (T.N), and Bangalore
 - b. Contract farming: Allow one to one relationship between producer and company. It should be based on farmer centric ‘Code of Conduct’.
 - c. Producer companies: The experiences of Madhya Pradesh are encouraging and the participating farmers able to increase in income by 66 %. They are open to contact with Reliance Fresh and ITC to do dedicated farming.

- d. Mega Food Parks: Provide backward and forward linkage and also facilitate establishment of integrated value chain.
- e. Strengthening Market Information System through establishment of market information centers at block level. Private Company provides market information on the mobile of participating farmers and charged some money from them. The innovative way of providing market information is cost effective and benefiting farmers by way of mitigating price risk.

Pheromone traps experience at CIPHET, Abohar

A farmer's participatory approach was used to popularise the application of sex pheromone traps in guava field as an IPM treatment. The solution of sex pheromone was formulated with ethanol, methyl eugenol and malathion (6:4:1). The 2"x 2" water absorbable ply wood pieces were soaked in the solution and fixed in a small plastic jar (Fig. 1). Four holes of 1.5 cm diameter were made in opposite directions on upper side of the jar and installed in orchards @ 1 trap/acre. Currently, due to its effectiveness and efforts of CIPHET this technology is being practised in about 1500 ha area in Abohar region. It has proved as a boon for the fruit fly management in guava fields. Counts of the fruit flies (*B. zonata* and *B. correcta*) in traps were recorded after every 20 days of fresh trap installation. Number of *B. zonata* was found 600-700 per trap during Dec-Jan, 2008-09, when first trap was installed (Fig. 2). Whereas, number of *B. correcta* fruit fly was found only 5-10 per tarp (Fig. 3). Gradually, a drastic decrease in fruit flies numbers (40-50) has been observed during Aug- Sep, 2009, in each trap. Guava fruit samples were randomly collected from 10 fields and it was found that they had only 9-10% fruit fly infestations, which was 50-60% in first crop period. Outcome of impact analysis of the farmer fields indicated 80-90% decline in insecticides application for the fruit fly control.



Fig. 1: Sex pheromone trap for fruit fly (*B. zonata*, *B. correcta*)



Fig. 2: *B. zonata*



Fig. 3: *B. correcta*

Licensing of Technologies during December 2009

Sr. No.	Name of the technology	Contracting party	License fee	Date of commercialization
1	Licensing of technology of ground nut milk, curd and paneer	Mr Munish Chawla Ludhiana	Rs 2,100	19-12-2009
2	Meat processing and value addition	Mr Pradeep H Ambre, Indo Emu Farm Products Mumbai	Rs11,000	16-12-2009
3	Evaporative Cooled room	Vijay Khandelwal KK Road Moudhapara Raipur Chhatisgarh – 492001 Mobile: 9425504559	Rs 500	11.12.2009
4	Licensing of technology of ground nut milk, curd and paneer	Bachittar singh Garcha VPO Deh kalan, Sangrur.	Rs.2,100	9.12.2009
5	Licensing of technology of ground nut milk, curd and paneer	Manish shadija Symphony Tradecomn. Pvt. Ltd. Raipur	Rs.11,000	9.12.2009

Job Opportunities

Walk in Interview for Research Associate

Applications are invited for the post of Research Associates (RA) of a sub – project of National Agricultural Innovation Project (NAIP) at Central Institute of Post-Harvest Engineering and Technology, Ludhiana, Punjab. The appointment will be purely temporary under contractual and co-terminus basis, following the prescribed procedure for six months or till the completion date of the project. The appointments may be terminated at any time without notice or assigning any reason thereof.

Name of the sub-project: Development of Non-destructive Systems for Evaluation of Microbial and Physico-chemical Quality Parameters of Mango.

Date of Completion of the project: 31/03/2012

1. Research Associates:

- i) Number of Posts
- ii) Qualifications

One

a) Essential

Ph.D. in Post– Harvest Engineering & Technology / Agricultural Process Engineering / Dairy & Food Engineering / Food Processing / Technology/Biotechnology/ Biochemistry

Or

Master degree in any of the above subjects with at least 2 years of research experience as evidenced from fellowship/ associate-ship/other engagements.

- b) Desirable
Published research papers, exposure to instrumentation, biosensors and statistical analysis software packages for chemo-metrics.
- iii) Remuneration Rs. 18000/-+ HRA (Rs. 17000/- + HRA for Masters degree holders) per month consolidated
- iv) Age limit 40 years for Men and 45 years for Women

Date and place of interview: 09/02/2010, 10.30 AM.

Central Institute of Post-harvest Engineering and Technology,

PO: PAU, Ludhiana – 141 004, Punjab.

Terms and Conditions:

- i) The above positions are purely on temporary basis and co-terminus with the project
- ii) No TA / DA will be paid for attending the interview
- iii) The applicants must bring with them original documents and a brief of research work carried out during post-graduation / Ph.D. along with one set of photocopy at the time of interview.
- iv) No objection certificate from the employer in case he / she is employed elsewhere.
- v) Experience certificate in original (if any)
- vi) All eligible candidates are requested to be present 30 minutes before scheduled time on the date of Interview for necessary formalities.
- vii) No separate interview call will be issued to candidates
- viii) Canvassing in any form will render the candidate disqualified for the post
- ix) The Director, CIPHET, Ludhiana's decision will be final and binding in all respects.

Note : The applications with detailed bio-data in the following proforma (1) Name of the candidate (2) Father's Name (3) Date of birth (4) Present address (5) Permanent address (6) Qualifications (7) Experience, if any (9) Publications etc. should be sent through registered post and email (snjha_ciphet@yahoo.co.in, knarsan@yahoo.com) with passport size photograph to Dr. S. N. Jha, Consortium Principal Investigator, (CPI), NAIP & Sub - project, CIPHET, PO : PAU campus, Ludhiana – 141 004, Punjab and attend the walk-in-interview as per above schedule.

Walk in Interview for Senior Research Fellow

Applications are invited for making the panel for the appointment to the post of one Senior Research fellow (SRF) now and subsequently as and when vacancy arises, in a sub – project of National Agricultural Innovation Project (NAIP) at Central Institute of Post-Harvest Engineering and Technology, Ludhiana, Punjab. The appointments will be purely temporary under contractual and co-terminus basis, following the prescribed procedure **for six months** or till the completion date of the project. The appointments may be terminated at any time without notice or assigning any reason thereof.

Name of the sub-project A Value Chain on Novelty Pork Products Under Organized Pig Farming System

Date of Completion of the project: 30/06/2012

- (i) **Post** Senior Research Fellow (one number)
- ii) **Qualifications** M.Tech. / M.Sc. in Post – Harvest Engineering & Technology / Agricultural Process Engineering / Dairy & Food Engineering / Food Processing / Food Science/ Food Technology/Meat Processing/Biochemistry/Livestock Products Processing
- a) **Essential**
- b) **Desirable** Exposure to process equipment design which forms the major duty of the job
- iii) **Remuneration** **Rs.12000/- consolidated + HRA for first & 2nd year and Rs.14000/- consolidated + HRA per month from third year of the appointment.**
- v) **Age Limit** **35 years for men and 40 years for women**

Date and place of interview : 9th February 2010, 10.30 A.M., Central Institute of Post-Harvest Engineering and Technology, PO: PAU, Ludhiana

Terms and Conditions:

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- iii) The applicants must bring with them original documents and a brief of research work carried out during post graduation / Ph.D. along with one set of photocopy at the time of interview.
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Technology of the Month:

Home Scale Processing of Flax for Nutraceutical Use

Flaxseed or linseed (*Linum usitatissimum* L.) is grown extensively for its fibre and seeds. Flaxseed use in foods has increased during the past decade due to presence of functional compounds-alpha linolenic acid (ALA), lignans and fibre. The main components of flaxseed expressed on moisture free basis are protein (21%), dietary fibre (28%) and fat (41%). Flaxseed has unique fatty acid profile where ALA constitutes about 57%. Moreover, flaxseed is a major dietary source of lignans present as secoisolariciresinol diglucoside (SDG).

Health Benefits of flaxseed

Flaxseed consumption exhibits potential health benefits that include reducing the risk of cardiovascular diseases, cancer and diabetes. Omega-3 fatty acid present in flaxseed helps in reducing blood triglycerides, blood pressure, platelet reactivity, neutrophil activity and increase blood HDL cholesterol thus help in lowering CVD risk. The high amount of lignan present offers protection against breast and colon cancer. Flaxseed has a potential to increase laxation due to high dietary fibre content which absorb water and increase intestinal bulk and thus plays an important role in preventing and curing constipation condition. Flaxseed dietary fibres also play a role in diabetes and coronary heart disease risk, preventing colon and rectal cancer and the incidence of obesity.

In our typical Indian vegetarian diets, one of the typical fats we miss out on is omega-3 fats. So we should increase the consumption of flaxseed at home scale to derive the benefits of flaxseeds. Flaxseed adds two appealing textural feature to foods, tenderness due to fat content and crunchiness from the seed coat. It can be easily and successfully incorporated and accepted in wide range of recipes. Since flaxseeds are hard to chew, ground flaxseed is more popular. Consuming ground flaxseed allows enhanced nutrient absorption. *We can use a food processor or blender to grind flax at home and then use it. Ground flaxseed should be stored in an air tight opaque container in a refrigerator to protect it from deterioration.*

Recommended Dose

For Children

Daily 1 tbsp of ground flaxseed or 1 tbsp of fresh flaxseed oil.

For adults

Flaxseed	:	1 tbsp whole or bruised seed with 150 ml liquid.
Poultice	:	15 gm soaked in boiling water, strained and used, place in cheese cloth and applied.
Decoction	:	15 gm whole seed simmered in 1 cup of water for 10-15 minutes.
Flaxseed Oil	:	1 tbsp oil daily.

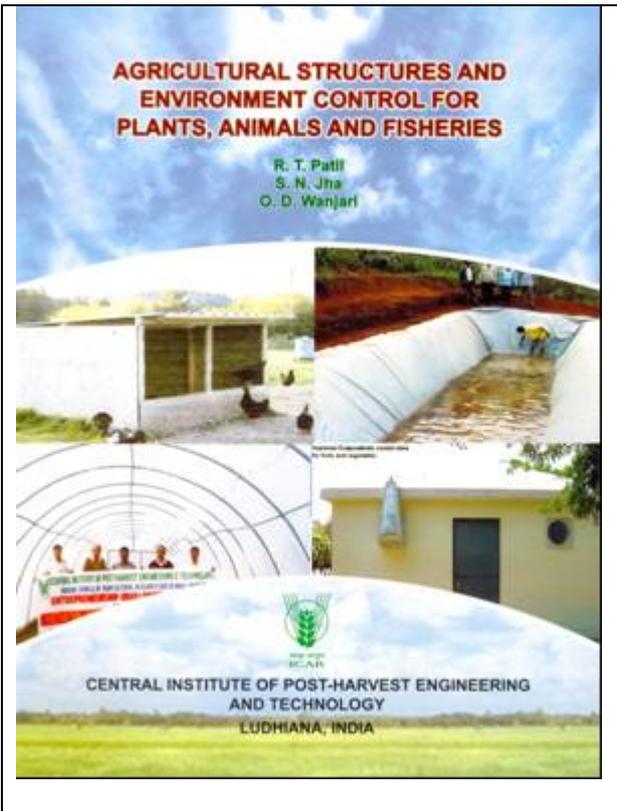
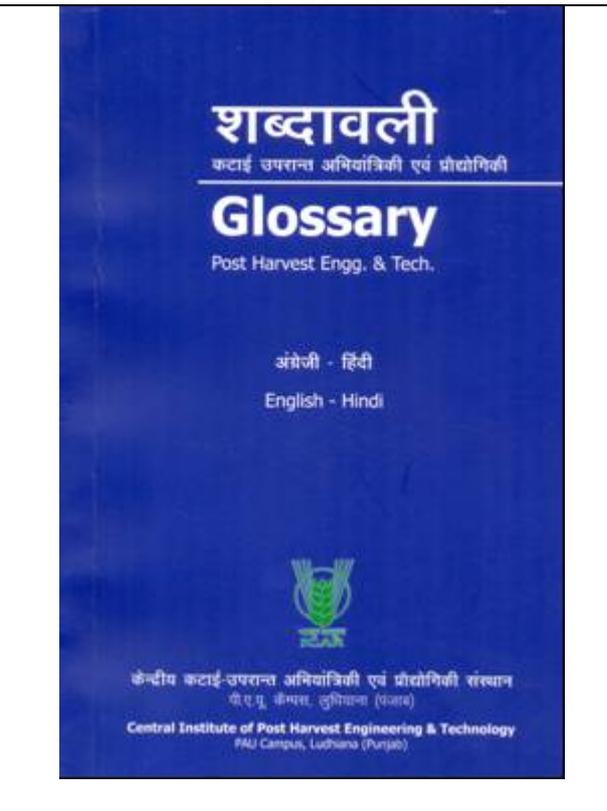
Way to include flax seed and flax oil in home cooking

Substitute for eggs: You can mix one tablespoon of ground flax seeds with three tablespoon of water, let the mixture sit for two to three minutes to thicken it. This mixture can replace eggs in recipes such as pancakes, muffins or cookies.

Substitute for fats: Replace one tablespoon of fats with three tablespoon of ground flaxseeds. You can use the flaxseeds to replace margarine, butter or shortening in a recipe. Note that flax causes baked food to brown more quickly, so be sure to adjust the baking times. Flaxseed oil, can be added to salads, baked potatoes, rice or vegetables to replace margarine, yet enhance the taste and texture of foods. We can even add it to juices and drinks. Add the oil after the food is cooked as high heat will reduce the oil's nutritious value.

Sprinkle ground flax seed on cereal, soups and salads. Ground flax seed can be added to the whole wheat flour for making chapatti. Flax can be added while grinding for idli or dosa.

Publication of the Month

 <p>AGRICULTURAL STRUCTURES AND ENVIRONMENT CONTROL FOR PLANTS, ANIMALS AND FISHERIES</p> <p>R. T. Patil S. N. Jha O. D. Wanjarl</p> <p>CENTRAL INSTITUTE OF POST-HARVEST ENGINEERING AND TECHNOLOGY LUDHIANA, INDIA</p>	 <p>शब्दावली कटाई उपरान्त अभियांत्रिकी एवं प्रौद्योगिकी</p> <p>Glossary Post Harvest Engg. & Tech.</p> <p>अंग्रेजी - हिंदी English - Hindi</p> <p>केन्द्रीय कटाई-उपरान्त अभियांत्रिकी एवं प्रौद्योगिकी संस्थान पी.ए.पू. कैम्पस, लुधियाना (पंजाब)</p> <p>Central Institute of Post Harvest Engineering & Technology PAU Campus, Ludhiana (Punjab)</p>
<p>Proceeding on National Seminar on Agricultural Structures and Environment Control for Plants, Animals and Fisheries</p>	<p>Glossary of English-Hindi words used in Post Harvest Engineering & Technology</p>

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