



Central Institute of Post Harvest Engineering & Technology Ludhiana

OUR SLOGAN: PRODUCE, PROCESS AND PROSPER

**CIPHET E – Newsletter for February, 2010
Vol. 5 No. 2**

Director's Column



Dear All

Major event this month was the annual Conference of ICAR Directors which was held during February 15-16, 2010 at NASC, New Delhi and interface between ICAR Directors and SAU Vice Chancellors on 17th February 2010. On first two days, it was Directors' conference where various issues related to ICAR institutes were discussed. Another major event which was supported by ICAR, IARI and also CIPHET was the International Conference & Exhibition on Post Harvest Management and Valorization of Agriculture & Horticultural Produce at NASC Complex, New Delhi on February 19-20, 2010. Based on the deliberations in the technical sessions and panel discussion on Industry-academia interface and based on the deliberations held in different session and major recommendations on Researchable Issues with funding from both Public and Private Institution and Policy Issues were arrived at this meeting which will be useful for development departments to develop roadmap for post harvest management and value addition of horticultural produce in the country. The twenty third National Convention of Agricultural Engineers organized by Institution of Engineers was also held during Feb 6-7, 2010 at MPKV Rahuri, Maharashtra

This month it was a treat to hear the living legend and father of green revolution and economic ecology Dr. M.S. Swaminathan during annual convocation of PAU Ludhiana. He spoke at length on future strategies needed for sustainable growth of agriculture in India including the importance of post harvest technology. He stressed on establishing ultra-modern grain storages at least in 50 locations in the country, each with a storage capacity of a million tonnes of food grains (ie, a 50 million tonnes storage grid) to ensure the food security of our country.

CIPHET has initiated the work on improvement of value chain which was presented before the IMC members to get their input. The selected underutilized fruits are Aonla (*Emblica officinalis*), Ber (*Ziziphus mauritiana* Lamk.), Jamun (*Sizigium cumini*) and Custard apple (*Annona squamosa*) which are considered to be important minor or underutilized fruits in the country under NAIP project.

This month also CIPHET licensed meat processing and value addition technologies developed by the institute to three entrepreneurs from states of Maharashtra, Karnataka and Tamil Nadu for commercial use. Entrepreneurs will be using CIPHET's brand name for marketing their products to attract consumers.

The technology flashed this month from CIPHET is design and assembly of the millet mill based on the novel process developed earlier in which distinct separation of husk and bran is achieved so that millet bran oil also can be extracted. The critical components of the process and equipment are the pretreatment to grain and modified rubber roll sheller assembly for dehusking followed by pressure polishing. The technology is ready for licensing so that processing of millets is possible at production catchment level.

We are thankful to Institution of Engineers (India) and Bioved Research Society for recognizing our scientists for their efforts to the cause of post harvest technology.

With best regards

**R.T. Patil
Director**

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Twenty Third National Convention of Agricultural Engineers & National Seminar of Institution of Engineers (India)

The Institution of Engineers (India) established in 1920, is the largest body of professional engineers in India with total membership of about 5 lakhs, encompassing 15 engineering divisions. National Convention is the apex activity held every year in different centres on the themes of national importance. The Institution of Engineers (India) has 94 State and Local Centres in India and 5 Centres abroad with its headquarters in Kolkata. Maharashtra State Centre is one of the most vibrant centres and has been organizing National Conventions/Seminars/Workshops regularly in the state of the art subjects of global importance. The theme of this year's national convention held at Dr. Annasaheb Shinde College of Agricultural Engineering, Mahatma Phule Krishi Vidyapeeth, Rahuri during February 6-7, 2010 was **"Agricultural Mechanization through Entrepreneurial Development"**.



Dr. Patil receiving Eminent Engineer Award during inaugural session

Agriculture is the mainstay of the economy in India. Agriculture and allied sectors contribute nearly 20 percent of Gross Domestic Product (GDP) of India. About 65 percent of population depends on agriculture for their livelihood. The agricultural output, however, depends on monsoon and as nearly as 60 percent of area sown is dependent on rainfall. The spatial and temporal variations in rainfall and other climatological parameters such as temperature adversely affect the agricultural output. In spite of adverse natural phenomena, Indian farmers have put their sincere efforts and skills over last few decades, which resulted in maintaining or increasing the annual agricultural output. As per estimate, an all time record production of food grains of 230.67 million tonnes was obtained in 2007-08. The cost of production is high. Labour availability is decreasing and is not available in time. The input efficiency is poor. The efficiency of labour is also poor. To increase productivity per unit of input suitable mechanization is the need of the hour. The agriculture mechanization has been limited to tractors only. Mechanization does not mean only use of tractors, but use of modern technologies for increasing agricultural production and profitability. Mechanization of agriculture in India is hindered by small land holdings, cultural traditions and economic inability of Indian farmers. Keeping in view of the land holding, cultural practices and agro-climatic regions, suitable measures need to be developed and popularized to promote the farm mechanization.

The main objectives of this annual convention were to:

- Formulation of the strategies for development of region specific farm equipments and tools suitable for Indian farmers.

- Formulation of the strategies for obtaining feedback from farmers.
- Suggestions to State and Central Governments to establish the infrastructure for financial, administrative and technical assistance to the farmers.

The convention was inaugurated by Dr. VM Mayande, VC, Dr. PDKV Akola and presided over by Dr. RB Deshmukh, VC, MPKV, Rahuri. Dr. MM Pandey, DDG (Engg.) was guest of honour who also delivered a Rabhindranath Tagore Memorial Lecture. Dr. RT Patil, Director CIPHET delivered a key note paper on Mechanization of Post Harvest Sector-Problems and Prospects and also showcased the CIPHET technologies during the interactive session with farmers, entrepreneurs and industry.

Annual Conference of ICAR Directors and Interface meeting with SAU Vice Chancellors

The annual Conference of ICAR Directors was held during February 15-16, 2010 at NASC, New Delhi and interface between ICAR Directors and SAU Vice Chancellors on 17th February 2010. On first two days, it was Directors' Conference where various issues related to ICAR institutes were discussed. In this meeting special presentations were made by eminent speakers on following topic-

1. Climate change by Dr. P.K. Agarwal, National Professor, IARI.
2. Agricultural biotechnology by Dr. P.Anand Kumar, Director, NRCPB.
3. Food Supply & Demand Scenario by Dr. Ramesh Chand, National Professor, NCAP.
4. Perspective Plan of ICAR by Dr. P.K. Joshi Director, NAARM.
5. Organic farming by Dr. Tej Pratap, Vice-Chancellor, YPUHF, Solan.

There were special interaction sessions with Prof. (Dr) MJ Modayil, Member, Agricultural Scientists' Recruitment Board, New Delhi and Dr. R.S. Paroda, Executive Secretary, APAARI & Former Secretary, DARE & DG, ICAR.

The interface meeting of the Directors with Vice-Chancellor of Agricultural Universities was inaugurated on February 17, 2010. The inaugural address was delivered by Hon'ble Union Agriculture Minister Sh. Shard Pawar Ji and special address by Prof. K.V. Thomas, Hon'ble Minister of State for Agriculture, Govt. of India.

Hon'ble Minister of Agriculture, Consumer Affairs, Food and Public Distribution Shri Sharad Pawarji urged agricultural scientists to double their efforts to remove all misgivings regarding GM crops from the minds of policy makers and public. He mentioned that the recent decision on Bt. brinjal should not be seen as a setback to our efforts, but should be taken as a challenge. He said that conventional technologies of agriculture are inadequate to meet the formidable challenges. The most compelling case for bio-technology and more specifically transgenic crops is their capability to increase crop productivity, lower production costs, conserving bio-diversity, efficient use of external inputs, and improvement of economic and social benefits and alleviation of abject poverty in poor and developing countries.

Minister underlined the need for alliance of ICAR-University and line departments of State governments for creating an atmosphere of academic excellence. He said, 'we must strive to be models of all-round excellence in creating institutions of global standards. Requisite models of public-private partnerships must be evolved for educational activities as well as for development, application and flow of technologies from lab to the market place and for strengthening of National Agricultural Research System (NARS) infrastructure, through active interface with the industry.' The Minister of State for Agriculture, Consumer Affairs, Food and Public Distribution Prof. KV Thomas, in his address, emphasized on the need for a big push in the higher education sector in Agriculture and Allied subjects- both economically

and technologically. He called for a three-fold increase in the number of PhDs, Post Doctoral, Masters and Bachelor degree holders and integrating PhD students with the research priorities of ICAR. He stressed upon prioritizing research in cutting edge areas like nano technology, biotechnology and instrumentation in agriculture for sustainable momentum in agriculture. He also emphasized on strengthening international cooperation, and private sector participation in the field of agricultural research.

International Conference & Exhibition on Post Harvest Management and Valorization of Agriculture & Horticultural Produce

The International Conference & Exhibition on Post Harvest Management and Valorization of Agriculture & Horticultural Produce was organized by Pesticides Manufacturers & Formulators Association of India and IARI New Delhi at NASC Complex, New Delhi on February 19-20, 2010. It was also supported by CIPHET, Ludhiana. This meeting was inaugurated by Sh. Ashok Sinha, Secretary, Ministry of Food Processing Industries. The keynote address was delivered by Dr. Mangala Rai, Former Secretary, DARE & Director General, ICAR followed by special addresses by Ambassador Eric M. Bost, Former US Ambassador to South Africa and Vice President for Global Initiatives at Texas A&M; Dr. Ed Price, Director of the Norman Borlaug Institute for International Agriculture, TAMU and Dr. S.K. Datta, DDG (CS), ICAR. The meeting was also attended by Dr. CD Mayee, Chairman, ASRB New Delhi and Dr. MM Pandey, DDG (Engg.) ICAR.

The meeting was divided into six sessions:

1. Integration of pre and post harvest management of Agri-Horticultural produce
2. Development of novel food products as convenience/functional foods
3. Packaging and storage of Agri-Horticultural produce
4. Emerging food processing technologies
5. Food quality, hygiene, safety and trade
6. Panel discussion: Industry – academia interface

Director CIPHET, Dr. R.T.Patil, Dr. R.K.Gupta, Head Horticultural Crops Processing and Dr. Ramesh Kumar, Scientist attended this conference. Dr. Patil presented a lead paper on “Processed product diversification-Indian perspective, opportunities and constraints” and also chaired plenary session and panel discussion on Industry-academia interface and based on the deliberations held in different session the following recommendations were made from this conference:

Researchable Issues with funding from both Public and Private Institutions

1. It was felt that a database on nutritional and health benefit of the horticultural and arable crops need to be developed for various user agencies.
2. A document comprising of Do's and Don'ts on pre harvest crop management should be compiled for post harvest quality assurance of both arable and horticultural crops.
3. It was also felt that there is a great need for development of low cost hand tools for appropriate post harvest handling in order to reduce the bruise injury of fruits and vegetables.
4. Appropriate time of harvesting and on farm storage (EC stores) protocols for extending the shelf life and marketing of perishable horticultural crops are the need of the industry.
5. It was also felt that low cost transportation technologies should be developed for maintaining low temperatures during supply chain management through use of Ice cubes, grass mats etc.
6. More R&D efforts required to undertake the work on coarse cereals i.e. millets, sorghum etc for development of value added products

7. Safety and quality of natural dye to be used as food colours need to be established in view of their food safety before commercialization
8. Maximum and minimum limits for natural antimicrobial agents need to be standardized from the point of view of food safety

Policy Issues

1. The benefits of “Food miles” need to be extended to the local produce so that majority of the processing activities could be concentrated at the point of production catchment areas.
2. Colour coding of transport vehicle carrying perishable and agri-horticultural commodities should be implemented for smooth and rapid movement to destinations.
3. PSU like NABARD should establish the facilities in the production catchments areas.
4. Some important technologies like coconut water beer, banana beer, pineapple wine and bael wine could be evaluated for commercial production.
5. It was also felt that all the state governments should have institution of Post Harvest Technology and Entrepreneurship Development for providing vocational trainings for setting up primary processing industries for value addition of agri-horticultural produce in the production catchment areas.
6. Each and every food handlers should essentially undergo a minimum of 10 days training on GHP (Good Hygienic Practices) and GMP (Good Manufacturing Practices).
7. There should be active interface between R&D institution and production activities.
8. Extending cold chain facilities in fruits and vegetables similarly in the line of dairy industries.
9. On the NRI Day i.e. 8th January of every year, one session should be dedicated to address the investment opportunities in the area of post harvest technology and valorization of agri-horticultural produce by NRIs in India.
10. It was decided that the under utilized pre-cooling facilities should be tapped for their potential utilization round the year.
11. It was also felt that some of the success stories of the suppliers of perishable horticultural produce to departmental stores in India must have a wide publicity among the various user agencies.
12. Model developed by CEDD, Hyderabad for drying of food commodities should be shared by all the R&D institutions and replicated in several areas.
13. Nutritional labeling should essentially be used for information to the consumers and not to be viewed as a weapon for penal action.

Need for National Grid of Ultra-modern Grain Storages – Dr. M. S. Swaminathan



The annual convocation of PAU, Ludhiana was held on 10th February 2010 which was attended by Director CIPHET as a Member, Board of Management of PAU. On this occasion, Punjab Agricultural University awarded Doctor of Science (honouris causa) degree to Prof. M.S. Swaminathan, internationally acclaimed agricultural scientist and Chairman, National Farmers' Commission. The degree was awarded by the Chancellor of the University His Excellency Sh. Shivraj Patil, Governor of Punjab. Introducing Prof. Swaminathan to the Chancellor, and Faculty, PAU Vice-Chancellor, Dr. Manjit Singh Kang said Dr. Swaminathan has been hailed as agricultural leader of Green Revolution. He is a living legend and father of economic ecology. He has served on several important positions in India and abroad. He is also a Fellow of many leading scientific academies in India and other countries including Royal Society of London & US National Academy of Sciences. Prof.

Swaminathan has received 56 honorary doctorate degrees from universities around the world. At present, he holds UNESCO Chair in Eco-technology. He is also Member of Parliament (Rajya Sabha) since May 2007 to which position he was nominated by Government of India for his outstanding contributions in agricultural research and development.

Highlighting the importance of post harvest technology during the convocation address, Dr.M.S.Swaminathan stressed on establishing ultra-modern grain storages at least in 50 locations in the country, each with a storage capacity of a million tonnes of food grains (ie, a 50 million tonnes storage grid) to ensure the food security of our country. He also cautioned that the year 2010 is a do or die year for Indian agriculture. He said, "If we don't take steps to address the serious ecological, economic and social crises facing our farm families, we will be forced to support foreign farmers, through extensive food imports. This will result in a rise in food inflation, increase the rural-urban and rich-poor divides and allow the era of farmers' suicides to persist. On the other hand, we have a unique opportunity for ensuring food for all by mobilizing the power of Yuva and Mahila Kisans and by harnessing the vast untapped yield reservoir existing in most farming systems through synergy between technology and public policy". He emphasized during his address that overcoming hidden hunger caused by micronutrient deficiencies like iron, iodine, zinc, Vitamin A and Vitamin B12 can be achieved by growing and consuming appropriate local vegetables and fruits. There is a horticultural remedy for every nutritional malady. Moringa, which is a jewel in the horticultural crown, is an example. He stressed that this decade will show that the future belongs to Nations with grains and not guns. Human destiny during this decade and beyond will be shaped by farm women and men and this decade will thus be the Decade of Farmers.

Global Castor Conference - 2010

Global castor conference was held on 20-02-2010 at Ahmedabad (Gujrat) which was organized by the Solvent Extractors Association of India, Mumbai. At present, India is exporting about 60,000 to 70,000 tons of castor oil as raw material and also primary and secondary derivatives to Europe, USA, Japan and other countries. It is disheartening that India having a huge crop of castor seeds has been able to export castor oil as raw material to a large extent, while derivatives, only primary and secondary are only 25%. There is a potential and scope to convert entire available castor oil into value added products with development and production of still further tertiary or more complex value added chemicals. With such development India can emerge as a source of all castor oil chemicals for exports as well as for domestic consumption which means lot of industrialization in our own country.

Castor oil is non-edible vegetable ail obtained from Castor seed with an oil content around 46% and residual product is castor meal (Deoiled Cake). Castor oil is raw material for production of various chemicals with diverse industrial applications such as agrochemicals, lubricants, paints and resins, ink, plastics, various nylons and plasticizers, health care and cosmetics as also replacing important petroleum chemicals. Thus, castors oil based agro industry has great importance for our country and more so to Gujarat, Castor oil in that case generates whole range of innovative chemicals. Such chemicals made from castor oil have important industrial applications, but important thing is that castor oil is used for imparting its specific property to the chemicals to enhance its utility, even when used in a small proportion. India produces castor oil and derivatives plus chemicals worth Rs.4000/-crores giving value addition of around 33%. Value addition includes machineries and motive power, labour with creation of several thousand jobs. Out of this total ex port is around Rs.3000/-crores. The remaining is for domestic consumption.

It is important to give due importance to the residual product i.e. castor meal (Deoiled Cake). Castor meal forms almost over 55% of the castor seed crushed while producing castor oil. Optimum return from castor meal will improve the entire economy of castor industry. At

present castor meal is mainly exported at comparatively low price, though it is very valuable organic fertilizer which requires to be recognized by Central and State Governments for giving subsidy to the farmers as given in other countries. It requires support and encouragements from both the Governments so that Indian soil can be enriched for more productivity. In addition, castor meal has sufficiently good calorific value for using it as fuel as also for generating steam and motive power.

Er.V.K.Garg, Tech. Officer (T-9) attended this meet and presented research paper on “CIPHET CASTOR SEED DECORTICATOR/ DEPODDER” with the objective of reducing post-harvest losses, minimum manpower requirement, enhancing efficiency of depodding/decorticating and expansion of crop growing area as well as processing industry. The decorticator is based on principle that castor pods are allowed to rotate at a high speed in the presence of air and strike the inner painted walls of the outer cover with striking force of 4-5 Kgf so as to break the pods without damaging seeds and kernel. Rotational speed is directly proportional to Kgf produced. The machine was optimized at 740 rpm for getting maximum impact force on pods without damaging castor seeds Maximum decortication and depodding efficiency of 98.5% was found at the 6.22% (w.b) moisture content. A single person can operate the machine and capacity was as high as 19 Kg/h of depodding and decortication.

National Seminar on Value Addition of Agricultural Produce and Current Status of Small Scale Food Processing Units

India is world's second largest food producer and its contribution to GDP is only around 20%, despite of the fact that nearly 60% of its population is employed in agricultural related activities. It is a starking fact that India still processes nearly 2% of fruits and vegetables produced as compared to China and UK processing 23 and 88% of the food that they produce respectively. The inadequate cold storage facility results into post harvest losses to the tune of 37% of the annual food production which amounts to Rs. 30,000 - 40,000 crores. The present scenario of food production indicates that there is a need to give a boost to food processing sector by developing innovative technologies to reduce the post harvest losses to minimum possible extent. Indian Institute of Crop Processing Technology and Ministry of Food Processing Industries, GOI in association with Maharana Pratap University of Agriculture & Technology, Udaipur organized a two days National Seminar on “Value Addition of Agricultural Produces and Current Status of Small Scale Food Processing Units” on 18th and 19th February 2010 for the benefit of stake holders in the food processing sector with the following objectives.

- To ascertain the technological need gaps and problems in food processing sector in India to compete with the global market
- To create awareness among the stake holders on the business
- To create awareness among the stake holders on appropriate and improved post harvest technologies with special emphasis to food processing and preservation
- To develop linkage between the stake holders in the food value chain such as farmers processors, entrepreneurs, R & D institutes, Government and Non-Government Agencies

From CIPHET, Dr. S.K. Nanda, Project Co-ordinator AICRP on Post Harvest Technology, chaired the Technical Session I: Primary Processing of Foods and delivered a lecture on “Primary processing in production catchment for rural prosperity”.

National seminar on Sustaining food supply, agro biodiversity and rural livelihoods

Despite the impressive outcome of the Green, White and Blue Revolutions, achieving food security for all is still a challenge. Of course, there is a manifold increase in production of food, milk and animal products. However, to meet the increasing demand, it ought to be scaled up. The projected demand for 2020, egg production should go up from 50 billion pieces to 190 billion pieces and meat production from 0.7 million tonnes to 5.9 million tonnes annually. To discuss these issues UGC-Sponsored national seminar on Sustaining food supply, agro biodiversity and rural livelihoods (SFARL 2010) was held during February, 18-19, 2010 at Annamalai University, Tamilnadu. Dr. S. Balasubramanian, Senior Scientist presented a *policy paper on millets* during the conference. Other topics discussed during this national seminar were Agri-Business incubator, nanotechnology application in eco system, animal husbandry for sustainable food supply, climate resilient farming systems, farm diversification and integration, nutrient and pest management, participatory research, crop production and protection, social and economic policies biodiversity and ecological concerns, farm mechanization, post harvest processing, value addition, rural livelihoods etc.

National Seminar on Conservation of Lakes and Water Resources

Water has been an essential part of life ever since life has emerged on this planet. All human habitats and civilizations have developed around water resources. With the advancement of technologies and changed life style, water is becoming a scarce commodity. As a result of population explosion and expansion of industries, conservation and recycling of water have become very essential. Government, Non government and International organizations are working hard to conserve and maintain the quality of water. The quantity and quality of water supplied in cities and villages do not meet the BIS and WHO standards. Awareness and education of the people to adopt simple home techniques for conservation and purifying water at least for drinking purpose must be encouraged. This calls for all organizations engaged in water and health environment to come together to conserve the water resources and ensure supply of good quality water. There is a need for a forum for the exchange of information among experts in this rapidly growing field of great concern, particularly different aspects of conservation of lakes and water resources. With this background, National Seminar on Conservation of Lakes and Water Resources was organized by CTAE, MPUAT at Udaipur during 19-20 February, 2010. Dr. P. R. Bhatnagar PC (APA) from CIPHET participated in this conference and presented the paper entitled "Pond lining and rainwater harvesting for irrigation to horticultural crops".

12th Indian Agricultural Scientist and Farmers' Congress, Allahabad.

Now agriculture has become high risk and high cost business. As a result the profitability of agriculture is declining. It is also clear that at various places the farmers are facing the problem of deficit-and a large number of farmers are intending to leave the farming. Suicide by the farmers, the backbone of agriculture, is a matter of serious concern. Increasing area under non-food crops is creating new challenge for food security. Opening of agricultural market is creating another challenge to the agricultural sector because of unfair competition with subsidized imports from developed countries, production of ethanol from food grains and impact of climate change on food security are new threats to the gross food production of the world. In this background 12th Indian Agricultural Scientist and Farmers' Congress during 20-21 February 2010 was organized by Bioved Research Institute of Agriculture & Technology, Allahabad. The main objective of holding the congress was to impart information on the advancement made different Agricultural scientists and farmers in different disciplines during the recent years. This congress was attended by Dr D M Kadam,

Senior Scientist and Dr Mukund Narayan, Technical Officer from CIPHET. Dr Dattatreya M Kadam, presented a research paper entitled “Effect of Foaming Agent Milk on Foam Mat Drying of Tomato Juice” and Dr. Mukund Narayan presented a paper entitled “Farmers Participatory Action Research Programme (FPARP): A Sustainable Farmer led Extension Model”

Institute Management Committee Meeting at CIPHET, Abohar

Twenty sixth Institute Management Committee Meeting was held at CIPHET, Abohar on 23rd February 2010. Director CIPHET was the chairman and other member namely Dr. Jaswant Singh, Dr. S. Banik, Dr. M.K. Garg, Dr. B.N. Patil and Sh. Harinder Singh Lakhmirwala participated in the meeting. Dr. R.K. Gupta, I/c CIPHET, Abohar and Sh. Mani Lal, AF&AO were special invitees for this meeting. Sh. Tej Ram, Administrative Officer coordinated the meeting as Member Secretary. In the forenoon, the members visited the CIPHET, Abohar farm, polythene lined water storage facility, low cost poly houses. They also saw use of plastic mulching, vermi compost and set up for vermi wash. The members also visited newly constructed agro processing complex building and saw the demonstration of millet mill, tablet making machine, low cost extruder and kinnow processing plant. The members also saw the workshop and research prototype of the ber destoner. Then, the meeting was held in the seminar hall at CIPHET, Abohar in which a special presentation was made by Dr. R.K. Gupta, Head, HCP on “Need for a Value Chain on Commercial Exploitation of Underutilized Fruits”. In his presentation, Dr. Gupta has emphasized the importance of value chain for selected underutilized fruits such as Aonla (*Emblica officinalis*), Ber (*Ziziphus mauritiana* Lamk.), Jamun (*Sizigium cumini*) and Custard apple (*Annona squamosa*) which are considered to be important minor or underutilized fruits in the country. In the afternoon, the members visited M/s. Zamindara Farmsolutions Pvt. Ltd. an organization engaged in custom hiring of agricultural machines at Fazilka. The same organization is now planning to diversify into post harvest & value addition of guava.



IMC members visiting M/s. Zamindara Farmsolutions Pvt. Ltd., Fazilka.

New Agro-Processing Centre Inaugurated at CIPHET, Abohar

On 23rd February 2010, New Agro-Processing Centre was inaugurated by Dr. R.T. Patil Director in presence of IMC members. This center is having facilities for Seed cleaning and grading, Cotton ginning machine, Minor millets processing unit and Food Processing unit. Seed cleaning and grading and Cotton ginning machine were shifted and commissioned from old building whereas equipments for dehulling and pearling of small millets have been recently developed under DST Project were commissioned in the Centre. The facility for seed

cleaning and grading is being used by the farmers for cleaning and grading of wheat, Bengal gram, green gram etc. on custom hiring basis.



Inauguration of Agro-Processing Centre in presence of IMC members

CIPHET signs MoU with entrepreneurs for licensing meat processing technologies

CIPHET signed a Memorandum of Understanding (MoU) with three entrepreneurs during 15 – 17, February 2010 for licensing them meat processing and value addition technologies developed by the institute for commercial use. Entrepreneurs will be using CIPHET's brand name for marketing their products to attract consumers. After signing MoU with three entrepreneurs from states of Maharashtra, Karnataka and Tamil Nadu, CIPHET Director Dr R.T Patil said that hygienic practices and simple marketing tools play an important role in attracting the consumers to buy the meat products. He said that now India had a lot of potential for marketing of processed meat products at higher prices as opening of multinational brands like KFC and McDonald had already generated demand in high end segment. "Processing needs to go hand-in-hand with production, if producers want to fetch good price," he added. Senior Scientist Dr Suresh K. Devatkal said that these entrepreneurs had got training in meat processing and value addition technology in the Livestock Products Processing laboratory of CIPHET and they would be making use of above technologies for processing of emu meat, poultry meat and rabbit meat. Entrepreneurs including Sh.Badresh Mehta from Dr Emu Products, Maharashtra, Dr. C S Srinivas from Pragatho Hatcheries, Karnataka, Sh. Ashok Kumar from Kamraj Integrated Farm, Tamil Nadu, said technologies developed by CIPHET would provide them great help in their meat processing units.



Signing of MoU with entrepreneur

Agro Processing Training Programme for Inmates of Central Jail Ludhiana

A team of scientist and technical Staff comprising Dr. H.S. Oberoi, Dr. Nilesh Gaikwad and Shri Chamanlal visited and imparted training on tomato puree manufacturing and bottling technology for 50 inmates of central jail Ludhiana. Dr. Oberoi briefed inmates about processing of tomatoes and its potential for self employment. This session followed by the hands on practical training for selection, washing, crushing, pulping for juice separation, bottle crowning/ corking and sterilization of bottled puree. The practical demonstration was conducted on crusher, pulper, and autoclave brought from Central Institute of Post harvest engineering and Technology. The Jail inmates were made aware about importance of sanitation and hygiene on manufacturing of tomato puree.



Inmates learning the technology of manufacture of tomato puree

Awards and Recognitions

Eminent Engineer Award of Institution Engineers (India)



Director CIPHET Dr. R.T Patil was awarded Eminent Engineer award of Institution Engineers India during 23rd National Convention of Agricultural Engineers organized by Maharashtra State Centre of Institution of Engineers held at Mahatma Phule Agricultural University, Rahuri, on February 6, 2010. This award was conferred on him for his eminence and contribution to the profession of agricultural engineering. Maharashtra State Center of Institution of Engineers recognized that during tenure of Dr R.T Patil as Director of Central Institute of Post Harvest Engineering and Technology (CIPHET) Ludhiana, the institution has accelerated the pace of post harvest research manifolds and also guided many novel and easy to adopt post harvest technologies developed by CIPHET scientists., which are now being greatly appreciated in the country and internationally.

Young Scientist Award of Boived Research Society, Allahabad

Dr. Dattatreya M. Kadam Senior Scientist (AS & PE) at CIPHET, Ludhiana received “YOUNG SCIENTIST AWARD – 2010” during 12th Indian Agricultural Scientists and Farmers Congress at Allahabad on 20-21st Feb 2010 from Boived Research Society, Allahabad for his contribution in Agricultural Structures and Processing.



Promotions & Transfers



Dr K.K Singh, Head, Food Grains and Oilseeds Processing Division (FG&OP) at Central Institute of Post Harvest Engineering and Technology (CIPHET), was promoted to the post of Assistant Director General (ADG) in Process Engineering at Indian Council of Agricultural Research (ICAR) Head Quarter, New Delhi. CIPHET Director and Staff of the institute congratulated Dr K.K Singh for getting prestigious position in ICAR.

- Dr. S.N. Jha joined as Head, AS & EC Division, CIPHET, Ludhiana w.e.f. 17-02-2010.
- Dr. A.K. Thakur, Sr. Scientist selected to the post of Principal Scientist at ICAR Research Complex for Eastern Region, Plandu, PO Rajaulatu, Via Namkum, Ranchi, Jharkhand and relieved from the Institute in the afternoon of 09-02-2010.

Job Opportunities

Walk in Interview

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 any branch of Agricultural Engineering, Mechanical Engineering, Chemical Engineering, Cryogenic Engineering / Post – Harvest Engineering & Technology / Agricultural Process Engineering / Dairy & Food Engineering / Food Processing / Food Science/ Food Technology/ Meat Processing/ Biochemistry/ Chemistry/ Livestock Products Processing Technology/Food Science and Nutrition/ and allied sciences | |
| a) Essential | | |
| b) Desirable | Exposure to process equipment/machinery 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 | |

3. Date and place of interview: **30th March 2010, 10.30 A.M.**, Central Institute of Post-Harvest Engineering and Technology, PO: PAU, Ludhiana

Terms and Conditions:

- The above positions are purely on temporary basis and co-terminus with the project
- No TA / DA will be paid for attending the interview
- 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.
- No objection certificate from the employer in case he / she is employed elsewhere.
- Experience certificate in original (if any)
- All eligible candidates are requested to be present 30 minutes before scheduled time on the date of Interview for necessary formalities.
- No separate interview call will be issued to candidates
- Canvassing in any form will render the candidate disqualified for the post
- 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 (knarsan@yahoo.com) with passport size photograph to Dr. K.Narsaiah, CCPI, NAIP Sub - project, CIPHET, PO : PAU campus, Ludhiana – 141 004, Punjab and attend the walk-in-interview as per above schedule.

Technology of the Month

Minor Millets Dehulling Machine

Though millets and sorghum account for only 4.7% of the world grain production, they are extremely important in the semi-arid and sub-humid zones as staples and ethno-botanical crops. These crops are major source of energy and protein for millions of people in Asia and Africa. Small or minor millets include proso millet (*Panicum miliaceum* L.), foxtail millet (*Setaria italica* L.), barnyard millet (*Echinochloa crusgalli* L.), little millet (*Panicum miliare*), finger millet (*Eleusine coracana*) and kodo millet (*Paspalum sorobiculatum*). These are also popularly known as coarse cereals and included in the broad category of cereals. These millets are nutritionally superior to rice and wheat. These are rich in protein, mineral and vitamins and contain higher proportion of dietary fiber than rice or wheat. Presence of all the required nutrients in millets makes them suitable for industrial scale utilization in manufacture of foodstuffs like baby foods, snack foods and dietary food products etc from both grain and flour.

Conventional Method of Dehulling

Usually minor millet seeds have four parts namely hull, bran, germ and endosperm. The hull contains mainly indigestible fibers. The bran covers the endosperm whereas the germ is very small and located on the central side at the base of the grain. Bran and germ are rich in oil and hence affect the storage quality of millets. In the process of converting millets in to number of products, they undergo number of unit operations like pearling, grinding, mixing, extrusion, baking etc. In the process of pearling, it is necessary to remove the hull, bran and germ to increase the shelf life of the dehulled grain and flour. Usually pearling of millets is done with abrasive mills.

At present dehulling of the millets in India is done in abrasive type of mills. The main disadvantage of abrasive dehulling is that the hull, bran, germ and powder of endosperm created during milling are mixed together and hence goes as waste. Similarly the loss of endosperm in the form of broken and powder takes place. Hence, there is a need to develop a suitable dehulling process for millets so that all these fractions can be obtained separately without mixing with other fractions of seed. The dehulling losses should also be reduced. In the process presently followed by industry, about 5-43% broken is formed during milling of sorghum (Francisco, *et. al*, 1981), which goes as waste due to presence of hull. Besides this the process requires very high energy to process the millets to get refined flour.

New Technology

The present invention gives a process for dehulling of millets using a simple and safe pretreatment and using compression and shear for dehulling, abrasion for removal of bran and germ and grinding with burr mill. In this process, the seed is dehulled first and then the bran and germ is removed. This dehulling system neatly and almost completely separates the indigestible hull from the seed. Recovery of endosperm (the main product for making refined flour) is qualitatively and quantitatively higher with this process. After polishing, the bran and germ obtained may be better used for animal feed, oil extraction or some other uses.

All five minor millets namely foxtail millet, little millet, proso millet, barnyard millet and kodo millet can be dehulled using differential speed double roll dehulling machine. The millets were first cleaned and graded (using any conventional air screen cleaner and grader).

In the step the moisture content of the millets were adjusted to a predetermined level by sprinkling the water on its surface and keeping the seeds for a predetermined time (4-6 h). This pretreatment toughened the hull and loosens it from the rest of the seed contained within. Immediately after the end of the treatment period, the seed is dehulled using a machine based on compression and shear mechanism. Differential speed roller dehulling machine is used for dehulling the pretreated seed. It consists of two rolls placed at a clearance of about 0.1-0.75 mm, which may vary according to the seed size. The rolls are spring loaded to avoid the breakage of the endosperm during dehulling. Compression and shear causes dehulling of the seed because bond between the hull and cotyledon becomes weak after pretreatment. The hull is removed from the dehulled lot using aspirator. A minimum dehulling efficiency of 85% can be obtained in the process.

The dehulled seeds are then separated using any conventional grader. Dehulled seeds are dried to bring moisture content to 10%. The bran and germ remains intact during dehulling and hence only hull are removed. Dehulled millet seeds are then polished using abrasive type of polishing machine. Rice polisher was evaluated for polishing the dehulled millets. The time required for polishing ranged from 10-30 seconds depending upon the degree of polish required. The polishing time also depends upon extent of bran removal to be achieved. A time of 15 seconds is sufficient to remove all the bran from the dehulled millets using emery (32 grade) in the abrasive mill. All germ and bran was removed in this process. The bran and germ was separated using blower.

The polished millet seeds can then be ground to fine powder using burr mill. In this, the polished grain can be fed to the burr mill at a feed rate recommended by the manufacturer for specific machine settings. The grinding is done in a way that temperature of the flour does not increase much to avoid any loss of nutrients. Refined millet flour of required particle size is obtained after grinding.



CIPHET Millet Mill

Capacity: 100 kg/h, Power requirement: 7.5 hp

Publication of the month

ProduceProcessProsper

CIPHET NEWS

Vol. X No. 2 POST HARVEST ENGINEERING & TECHNOLOGY - UPDATE July to December, 2009

From The Director's Desk....



A very important event in the second half of year 2009 in CIPHET was the visit of Honorable Secretary DARE and DG ICAR Dr. Mangala Rai ji to inaugurate the newly constructed laboratory building and encourage the staff of CIPHET to meet the expectations of the nation for developing indigenous technology for post harvest management and value addition of our crop wealth. During the period CIPHET has introduced many technologies including that of processing green chilli in to powder and puree, preparing groundnut milk, paneer and dahi from groundnut, low cost nutritionally improved meat products and extruded snacks. In addition to this the research findings on cooling systems for livestock comfort, preparation of cattle feed by utilizing the waste potato pulp and non destructive quality analysis of mango are also significant. A NAIP project on 'Mobilizing Mass Media Support for Sharing Agro-information' in which CIPHET is one of the consortium partners was taken up.

CIPHET organized a national seminar on food processing in Hindi language for dissemination of the scientific research findings in Hindi. Trainings were conducted at CIPHET Ludhiana for farmers from various districts of Punjab and Bihar on 'Post Harvest Technology for Rural Catchments'. Training courses was also conducted for officials from state governments of Maharashtra, Punjab, Nagaland and Uttarakhand at CIPHET Ludhiana and Abohar campus. An intensive meet was arranged at Ludhiana between the delegates of US based Women's Earth Alliance and local women entrepreneurs trained at CIPHET and PAU for exchanging information and knowledge. EDPs were conducted at CIPHET Abohar on aonla processing and pomegranate aril separation. A media meet was organized for strengthening the linkage between the scientific community and media under the NAIP Mass media project.

The Institute organized its seventeenth Research Council Meeting and some of the key achievements presented were popping unit for makhana, instant makhana kheer mix, beetroot and carrot powder for ready to serve drinks, pomegranate aril extractor, low cost belt dryer, package of practice for minimal processing of vegetable and blast chiller. During this period a good number of research papers were published and active participation in conferences, exhibition and other related programmes was taken up.

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(Dr. T. PATIL)

Central Institute of Post Harvest Engineering & Technology, Ludhiana, (Punjab)

CIPHET News July-Dec 2009

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