Central Institute of Post Harvest Engineering & Technology
Ludhiana
Our Slogan: Produce, Process and Prosper

CIPHET E – Newsletter for April 2009
Vol. 4 No. 4

Director's Column

Dear All,

This month I got an opportunity to attend the 6th International Postharvest Symposium in Antalya, Turkey. It was attended by 450 delegates from 82 countries and gave a very good opportunity to discuss scientific and technological innovations in storage, packaging, transportation and marketing of horticultural products. I preneted the work done in India especially at CIPHET on development appropriate technologies for horticulture and emphasized the importance of increasing the processing activity in production catchments. This will increase the profitability of farmers by providing shock absorbing ability for distress sale due to alternate markets by subjecting some portion of the produce to processing and value addition. The tools developed at CIPHET for aril extraction, machine for aril extraction, mobile cool chamber, basket centrifuge etc were appreciated by the participants and expressed their desire to collaborate with CIPHET for further research and development. It was very much appreciated by the smaller countries in general and developing countries in particular. The fruits and vegetables growers in general are not big farmers and more or less are prone to exploitation by the middlemen due to highly perishable nature in developed as well as developing country alike.

The comfort of live stock is essential for improving their productivity. The CIPHET has initiated a project on comfort of cattle and Poultry in collaboration with Guru Angad Dev Veterinary and Animal Science University (GADVASU), Ludhiana. Two evaporative cooling systems i.e. fan-fogger and fan-pad cooling have been designed and fabricated for cooling the shelters. The CIPHET designed cooling system is already catching up with farmers visiting GADVASU and enquiries are being received from the dairy farmers for the details like cost and availability of the cooling system components. The successful demonstration and comparative analysis of advantages of cooling system will definitely give a boost to this sector

Another important but neglected area in post harvest aspect of livestock produce is miserable, unhygienic conditions of meat shops in India. The CIPHET has a mandate to improve the post harvest handling and processing scenario of livestock products and has started with a baseline survey cum interaction of its scientists with meat retailers of Ludhiana city. In order to understand the requirement of these small meat shops with respect to hygiene, mechanization, scientists have conducted a baseline survey of 12 meat retail shops at Ludhiana. The major observations made were: On an average two persons were working in each meat shops. Most of the worker's education background varied from illiterate to 10th standard. The workers had very poor knowledge of hygiene and sanitation. Very few mechanical equipment were being used during slaughter and dressing process. Floor slaughtering, with minimal input of water and electricity was common in all meat shops. No use of gloves, mixing of offal's and fresh meat, poor cleaning and sanitization of knives were also observed. Keeping this view, the CIPHET is formulating research and development activities to modernize and upgrade the retail meat shops in Ludhiana city. The small mechanical equipment essentially required in meat retail shops will be developed and adopted along with training the personnel in posharvet handling and processing of meat. Development of a refrigerated cabinet for carcass display, small stunning equipment, and simple design small meat shops are some of the immediate objectives to be undertaken by CIPHET.

Thanking you for encouraging comments from time to time which keep us moving to serve the farming community more effectively.

With best regards

R.T. Patil
Director

In this issue

Dr. MM Pandey Joins as Deputy Director General (Engineering)

Dr. M.M. Pandey obtained his B. Tech. (Hons.) in Agricultural Engineering in 1975, M. Tech (FMP) in 1978 and Ph.D. degree in 1980, all from IIT, Kharagpur. Dr. Pandey joined CIAE, Bhopal (ICAR) as Scientist trough Agricultural Research Service in 1976. Dr. M.M. Pandey also served Gujarat Energy Development Agency (GEDA) as Dy. Director (Technical) in November 1992 and served the organization as Director from January 1995 to February 1996. He held the post of Project Coordinator of All India Coordinated Research Project on Farm Implements and Machinery at the Central Institute of Agricultural Engineering, Bhopal from February 1996 to May 2006. As Project Coordinator of AICRP on FIM, he was engaged in coordination of R&D, prototype production and extension work on farm implements and machinery at national level through 28 centers in different parts of the country. For his outstanding research contributions Dr. Pandey was awarded ISAE Fellowship 2000-2001 in the field of farm machinery and power.

Director CIPHET, Dr. R. T. Patil along with Project Coordinator, AICRP on PHT Dr. SK Nanda and Project Coordinator, AICRP on APA, Dr. P. R. Bhatnagar called on the DDG(Engg) to formally congratulate him and seek his guidance and directions for our activities. The DDG emphasized the need for establishing links with commodity institutes and with the scientist (s) in agricultural engineering discipline, if available in those institutes to bring in greater visibility to the profession and for timely solutions to their problems. He also emphasized the need for attention to a complete package of technologies for post harvest technology of different crops. He also suggested we should have a data base of the available technologies at production catchment level (Micro scale), (2) entrepreneurs' level (cottage scale), and (3) export oriented unit level (small industry level).

International Postharvest Symposium at Antalya, Turkey

The 6th International Postharvest Symposium was held during 8th to 12th of April, 2009, in Antalya, Turkey. The International Postharvest Symposiums are being held every 4 years since 1988 in various locations around the world and this was sixth in Antalya, Turkey. In this conference 450 delegates from 82 countries had participated. The Antalya Region is now called the "Turkish Riviera" due to its archaeological and natural beauties. Antalya is the place where sea, sun, history and nature constitute a perfect harmony and which also includes the most beautiful and clearest coast along the Mediterranean. The main theme of this symposium was to reducing postharvest losses so as to ensure sufficient food, both in quantity and in quality, to every inhabitant on our planet. There is a growing interest in all areas for storage and transportation of horticultural products, because the products are highly perishable and because of the long distances between countries and their major export markets.

For the first time, the International Postharvest Symposium was held consecutively with the Controlled and Modified Atmosphere Research Conference. The CAMA conference was during April 4-7, 2009. However the combination of these two important events in postharvest research reinforced each other. The primary purpose of Postharvest Symposium was to discuss scientific and technological innovations in storage, packaging, transportation and marketing of horticultural products including fruits, vegetables, flowers and fresh-cut produce. The symposiums provided an opportunity for all researchers from academia and private sector firms to get together and to discuss problems and solutions for maintaining quality, extending storage and shelf life, reducing physiological deterioration and pathological decay and other postharvest issues. Dr R T Patil Director CIPHET represented India in this conference and presented a lead paper on **Appropriate Engineering & Technology Interventions in Horticulture for Enhanced Profitability and Reduction in Post Harvest Losses** during the session on non destructive quality evaluation. During his presentation he emphasized the importance of development of processing industry in production catchments. This will increase the profitability of farmers by providing shock absorbing ability for distress sale due to alternate markets by subjecting some portion of the produce to processing and value addition. The tools developed at CIPHET for aril extraction, machine for aril extraction, mobile cool chamber, basket centrifuge etc were appreciated by the participants and expressed their desire to collaborate with CIPHET for further research and development. It was mainly appreciated by the smaller countries in general and developing countries in particular. The fruits and vegetables growers in general are not big farmers and more or less are prone to exploitation by the middlemen due to highly perishable nature in developed as well as developing country alike.

In other aspects of post harvest biology and technology, the emphasis was on health promoting qualities of the fruits and vegetables. Four sessions were devoted on this topic. The new findings emerged were identifying health promoting substances, bioactive compounds and antioxidants. The reports indicated that applying additional stress to vegetables after harvest increased the anti oxidants and other bio active compounds and hence they can be used as nutrient manufacturing factories, eg. Carrots can be used to produce carotenoids by increasing the wounding in the form of shredding. It was also reported in the studies that both physical and thermal stress increase the quantity of phyto-chemicals and also their availability and that proves that Indian system of copping the vegetables and cooking them completely rather than eating them half cooked or raw is highly healthy and keeps us fit.

At the venue of the conference there was exhibition about a various products required for better post harvest management,

Dr R T Patil, Director with the Organizing Secretary Dr. Mustafa Erkan

High Tech Green House

Citrus Pack House

Well Packaged Vegetables with or without MAP

Poster Session during the Conference

Participants in the Conference

Assistant Director General (Engg) Dr. S.K. Tandon visits CIPHET Abohar

Dr. S. K. Tondon ADG (Engg.) visited CIPHET, Abohar campus on 28.4.2009 along with Dr. RT Patil, Dr. Meshram, Jt Commissioner. Dept of Agriculture and Cooperation, Govt of India, New Delhi and Er. D. R. Kataria, Joint Director Agriculture (Engg), Govt of Punjab, Chandigarh. During the visit, they were shown various research activities, orchard and farm. The Pomegranate aril extractor (motorized machine) was shown to them and discussions held about further commercialization. He also visited pilot plant of kinnow grading, waxing, juice extraction, seed cleaning and grading unit, mechanized vermi compost unit and vegetables production under different types of polyhouses under APA Scheme. Dr. Tandon emphasized that farm should be maintained neat and clean and it should serve as a model for the farmers visiting CIPHET Abohar.

Dr. Tandon interacting with CIPHET staff and witnessing the working of motorized pomegranate aril extractor.

Dr. Tandon also saw the biological control of fruit flies in CIPHET orchard. The fruit flies are polyphagous in nature and make infestations on many fruit crops like mango, guava, etc. while fruiting. To test efficacy on preliminary level, the sex-pheromone traps for the

monitoring and mass collection of male fruit flies (*Bactrocera jonata* and *B. dorsalis*) were installed in Guava orchard of the CIPHET Abohar Campus. The nearby farmers are very curiously observing this bio control method and hence similar traps have also been installed in farmer's field at Nihal Khera village for creating awareness about this simple technology for fruit flies collection and avoid the excessive use of chemical insecticides.

Dr. Jitendra Singh (Entomologist) explaining the sex-pheromone trap on mango tree to the visiting dignitaries.

Washing and Pre cooling of carrots by farmers in Punjab

Carrot (Daucus carota) is grown all over India. It is consumed raw as well as in cooked form. It is made into pickles and sweetmeat. Carrot juice is a rich source of carotene and is sometimes used for colouring butter and other foods. Black carrot is used for the preparation of a beverage called kanji considered to be a good appetizer. The Asiatic (tropical types) carrots attain marketable stage of maturity when these are 2.5–4cm in diameter at the upper end. Delay in harvesting makes roots fluffy and unfit for consumption. Early carrots for market are pulled out when partly developed. They are normally dug out, with a spade or khurpi when the soil is sufficiently moist. The roots are trimmed and brought to the market. Since the carrots grow under ground it is necessary that they are washed before sending to market. However due to lack of facilities and infrastructure the carrots are sold even without washing.

In Punjab, the production of carrot is around 1,00,000 tones. It has been observed while survey that farmers of Sadhuwali village (Rajasthan) situated at the border of Punjab and

Rajasthan wash their produce with simple indigenous equipment using canal water. The capacity of the washer is around 16-20 quintal per hour. The washer is owned by an enterprenur who parks his machine having diesel engine which provides the power for rotation of the washer as well as pumps the water from the canal and sprays on the carrots being washed. By having one washer, entrepreneur is earns around Rs. 1000 per day during season. The equipment cost around Rs. 35,000/- including diesel engine. This idea should be propagated in different part of the country where irrigation canal is accessible for washing of fruits and vegetables. The washing also removes the field heat and cools the fruit which not only improves the look and appearance but also extends the shelf life of fruits and vegetables. This method adopted in Punjab can be easily replicated in other parts of the country for better post harvest management of perishables.

Carrots before washing

Washer near irrigation canal, the carrots for washing being loaded

Washed Carrots

Spreading the carrots on the mat for surface drying

Packaging of washed and dried product fetches 50 to 100% higher price

Custom Hiring of farm implements by Farmers Cooperative Societies

The Govt. of India has planned to expand or strengthen existing activities of Farmer Cooperative Societies for custom hiring of farm implements. This scheme is also open for up-coming entrepreneurs who would like to go in for Agro Service Centre for custom hiring of farm implements. In this connection, Dr. S.K. Tandon, ADG (Engg.) along with Dr. Meshram, Jt. Commissioner (Agril), Govt. of India; Er. D.R. Kataria, Jr. Director Agriculture (Engg.),Punjab, and Dr. R. T. Patil visited two cooperative societies; one at Ayali Kalan and another at Sukhanand, Distt. Moga. This also provided an opportunity to promote food processing activities which can be taken up by these societies. Dr. Patil explained to the executive members of the society the potential of processing produce in production catchment and its marketing in niche markets where the traceability, food quality and safety is highly appreciated. The team also visited Modern Agro Service Centre at Fazilika, where a progressive farmer and dealer of tractor has started custom hiring of farm implements by the company called Zamindara Farmsolutions Pvt. Ltd. and Zamindara Engineering & Autos Pvt. Ltd. This centre is also very successful in utilization of farm machinery effectively for timely farm operations without capital investment by individual farmer. Director CIPHET explored the possibility of motivating these societies and entrepreneur engaged in custom hiring of implements to take the food processing activity during the lean period or period of harvest of fruits when the machinery requirement for production is at much lower level. It was assured to these parties that CIPHET will extend all help in training and quality control for production of quality processed products.

Meet on “Entrepreneur – Scientist – Farmers at Sardarkrushinagar Dantiwada Agricultural University, Gujarat

This meet was organized by Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujrat on 17 Arpil 2009 to bring the Farmers, Entrepreneur, and Scientist on a single platform for the utilization of surplus and bumper production through the appropriate processing and marketing strategies. Dr. RC Maheshwari, Honourable VC of the university chaired the meet. Dr. SBS Tikka, DOR and Dean PGS; Dr. Sridharan, Principle; Mr. Praveen Gupta DG APEDA; Dr. Ram Chandra, PS NRC Pomegranates; Mr. PM Badgujar, Scientist CFTRI Dr. SD Sharma, Directorate of Mashroom and Dr. Dilip Jain, Sr. Scientist (AS&PE) of CIPHET were present as scientific experts. Dr Jain gave a presentation on “Technologies developed at CIPHET”. About 15 Progressive Farmers and 15 Entrepreneurs / traders and exporters participated in the meet. Dr Maheshwari emphasized that the agricultural production in Gujarat has taken leap, however the post harvest processing is so far not taken up in the proportionate way. Therefore the appropriate steps for post harvest management must be taken at governmental, societal and individual level to get the optimum benefit of the production and to develop the export potential.

Annual workshop of NAIP projects in the area of Basic and Strategic Research in the Frontier Areas

The CIPHET has two projects as lead centre under this component namely- Development of Nondestructive Systems for Evaluation of Microbial and Physico-chemical Quality Parameters of Mango and Studies on Cryogenic Grinding for Retention of Flavour and Medicinal Properties of Some Important Indian Spices. As cooperating centre CIPHET has third project on Novel biotechnological processes for production of high value products from rice straw and bagasse with total funding of Rs. 5.87 crores. The first annual workshop was

held at Bareilly on 14-15 April 2009 and Dr K V Raman Chairman, RPC, Chairman, TAG-4, Chairmen of consortium Advisory Committees, PIs and CoPIs of 61 consortia with approved projects under Component 4. The objectives of workshop was to assess the progress, to share the lessons learnt and experiences for the benefit of CPIs of projects approved in third call and to facilitate interaction/linkages between consortia with technically related projects. Dr. K. K. Singh, Dr.S.N. Jha and Dr. K. Narsaiah attended the workshop from CIPHET, Ludhiana. The annual progress of NAIP subproject on Development of Nondestructive Systems for Evaluation of Microbial and Physico-chemical Quality Parameters of Mango was presented in the workshop. The Chairman expressed satisfaction on the technical progress made and the house also suggested to highlight the positive environmental and social impacts of the project. Interaction of PIs of projects was focused on food quality and safety to explore collaboration or exchange of ideas on biosensors and other instruments for determination of quality parameters. The workshop also covered presentations and discussion on monitoring and evaluation, social and environmental issues, procurement and financial management.

Zonal Institute Technology Management Committee (ZITMC)

ICAR recognizes the research in frontier sciences requires intellectual property (IP) through patents, plant variety protection and other forms of IPR. The transfer of IPR enabled agricultural technologies through commercial route will gain greater importance. In response to the changing scenario of technology generation and dissemination, ICAR has developed a policy framework that will guide the management of IP created by its scientists/innovators at its institutions or elsewhere, and that developed with its support. The ICAR has Central Technology Management Committee at the ICAR headquarters, chaired by Director General, ICAR and will be the apex decision-making body. All matters of policy concerning IPR portfolio management and technology transfer/commercialization will be decided by the CTMC. At the respective ICAR institutions, the Institute Technology Management Committee chaired by the Director of the Institution, will be final decision making body for IP related matters/progress /concerns. At the zonal level, the Zonal Institute Technology Management Committee (ZITMC) takes decisions for the IPR portfolio management and technology transfer/ commercialization of the ICAR institutions in the zone and also the inter-institutional matters. The ZITMCs also advises the institutions in the zone regarding their IPR portfolio and technology transfer matters. These central, zonal and institute level committees take steps to coordinate, harmonize and synergize with other relevant committees at the ICAR headquarters/institutions. The CIPHET falls under north zone –I. The meeting of Zonal Institute Technology Management Committee (ZITMC) under Zonal Technology Management Centre was organized at IARI on 24th April 2009. The meeting was chaired by Dr. H.S. Gupta, Director IARI and Dr. Mathura Rai, Director, IIVR, Varanasi. From CIPHET it was attended by Dr. Devinder .Dhingra, Sr. Scientist & I/c ITMU. Other members participated in the meeting were Dr. S Mauria ADG (IPR & P), Dr. Anil Wali, Managing Director Foundation for Innovation and Technology Transfer, IIT, New Delhi, Dr. Malathi Lakshmi Kumaran, Patent attorney, Dr. Pramod Kumar, Senior Scientist, IARI, CF & AO, IARI.

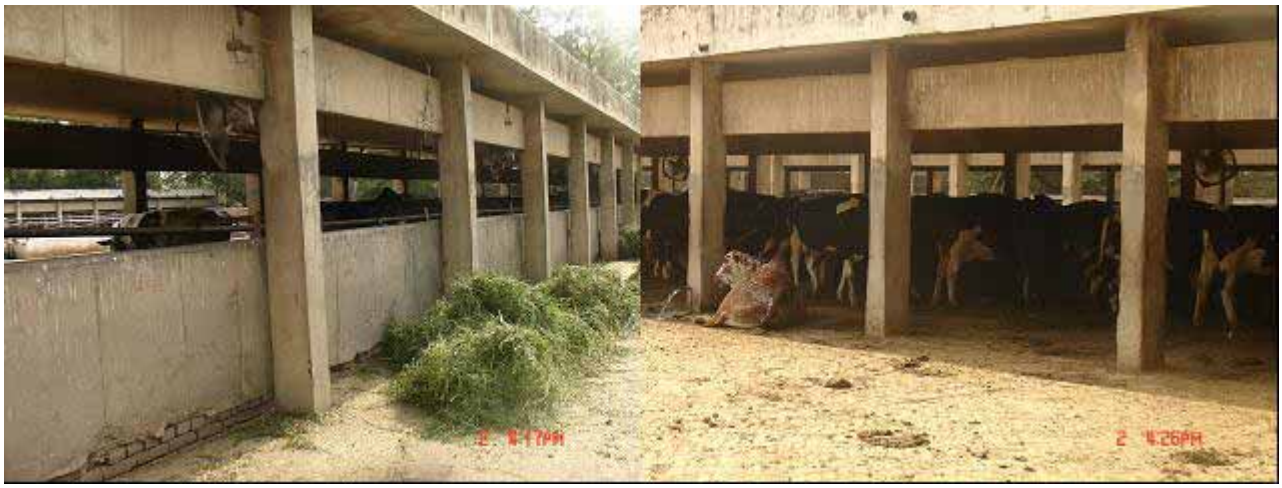
CIPHET Initiates Projects on Animal Comfort in Collaboration with Veterinary University at Ludhiana

CIPHET has initiated a project on comfort of cattle in collaboration with Guru Angad Dev Veterinary and Animal Science University (GADVASU), Ludhiana. Two evaporative cooling systems i.e. fan-fogger and fan-pad cooling were designed and fabricated for cooling

the cattle shelters in the dairy farms of the Department of Animal Breeding and Genetics, GADVASU. The cattle shelters at GADVASU are partially enclosed. The size of each shelter is 50 x 6 m with an open arena on one side and a feeding line on the other side and is called loose housing system.

The fan-fogger system consists of air circulator fans (size 36") mounted on the side walls of the shelters. Five fogger nozzles (0.5 mm size, 45 psi, 50° spray angle) are mounted on a copper ring, and fitted in front of the fan. The fans provide airflow of around 700 m^3/min and are tilted downwards at an angle of 20-30°. The ring containing the foggers is connected through a pump (by a high-pressure pipe) to the water tank. When the cooling system is turned on, the fans are run continuously. An adjustable timer with a 15 min cycle has been used to control the on-time of the foggers depending on the ambient conditions. Water is forced through the fogger nozzles in the form of fine mist, which is blown across the shelter by the fan. The evaporation of water which is in the form of fine mist results in cooling. The entrances to the shelter have been covered by tarpaulins to preserve the microclimate in the shelter.

The fan and pad cooling system consists of two coolers containing 36" / 700 rpm exhaust fans and pads. The pads are made of cellulose paper housed in a G.I casing with a water distributor through a P.V.C header. The water collecting tank is made of G.I and has a rugged construction. The intricately woven cellulose pads provide necessary water to air contact to achieve high efficiency in cooling. The feeding side and the entrance side of the shelter have been covered with net and tarpaulin to prevent solar radiation input and the cold air from escaping the shelter.



Cattle shelter at GADVASU

Fan-fogger system fitted at cattle shelter at GADVASU

Fan-pad cooling system in cattle shelter at GADVASU

CIPHET has also started another project for poultry comfort with GADVASU. The poultry shelter available in the department of Livestock Production Management, has been segregated into six experimental units, for cage and deep litter system for the layers. The studies are being done with fan-pad and fan-fogger cooling for the poultry.

The fan-fogger system consists of a blower with a ring placed in front of it. Foggers have been placed on the ring, which is connected with a water tank. The water is filtered and then pumped to the foggers. The on-off time of the foggers are controlled through a timer. When the fan and the fogger are both in on condition, a fine mist is introduced into the shelter leading to the cooling of the environment. During the off time of the fogger, the fan remains operational. The on-off cycle of the foggers is repeated cyclically.

The fan and pad system consists of cellulose pads, which are placed at one end of the shelter, and the exhaust fans are fitted at the opposite end. The water is pumped to the pads through a pump and the pads are kept wet. The cross ventilation of the air in this system gives the coolness in the shelter.

The studies are in progress and the data is being recorded. The effect of the cooling systems on the comfort and production of the cattle and poultry is being observed. Already the CIPHET designed cooling system is catching up with farmers visiting GADVASU and

enquiries are being received from the dairy farmers for the details like cost and availability of the cooling system components. The successful demonstration and comparative analysis of advantages of cooling system will definitely give a boost to this sector

Cage and deep litter system for poultry

Fan-fogger system at poultry

Cellulose pads of fan-pad cooling system for poultry

CIPHET Initiative to Modernize the Street Meat Shops

CIPHET's recent endeavor is to improve the post harvest handling and processing scenario of livestock products has started with a baseline survey cum interaction of its scientists with meat retailers of Ludhiana city. In a major initiative, it has planned to modernize the existing meat retail shops in Ludhiana. Under this plan CIPHET is planning to develop the major mechanical inputs required in a small meat shop. Therefore in order to understand the requirement of these small meat shops with respect to hygiene, mechanization, scientists have conducted a baseline survey of 12 meat retail shops at Ludhiana. Scientists evaluated the

present slaughtering procedures, hygienic status, mechanization level, quality and aesthetic appearance of meat, education level of personnel working in meat shops. The major observations made were: On an average two persons were working in each meat shops. Most of the worker's education background varied from illiterate to 10th standard. The workers had very poor knowledge of hygiene and sanitation. Very few mechanical equipment were being used during slaughter and dressing process. Floor slaughtering, with minimal input of water and electricity was common in all meat shops. No use of gloves, mixing of offal's and fresh meat, poor cleaning and sanitization of knives were also observed.

Recently Ministry of Food processing Industry has a launched a scheme of upgrading street food shops. Ludhiana is one of sixty cities to be covered under this scheme. Keeping this view, the CIPHET is formulating research and development activities to modernize and upgrade the retail meat shops in Ludhiana city. The above volunteer meat retailers will be taken into confidence to undertake the project of modernizing the retail meat shops. Under this scheme CIPHET will develop small mechanical equipment essentially required in meat retail shops, will train the personnel in posharvet handling and processing of meat. Development a refrigerated cabinet for carcass display, small stunning equipment, and simple design small meat shops are some of the immediate objectives to be undertaken by CIPHET.

Custom Hiring of Farm Implements- Zamindara Farmsolutions (ZFS)-A Successful Model to Emulate

Farmers in Punjab have traditionally taken costly bank loans to buy expensive farm equipment. This equipment has been by and large underutilized due to the small size of the farm holdings (4.2 million hectares are cultivated by 1.5 million families) and the seasonality of use. In effect the farmer has to pay the equipment ownership cost every day of the year rather than the few days of usage cost that he should have actually paid. With this situation in mind a company was formed progressive farmer Mr. Ahuja and His sons Vikram and Vinay. Zamindara Farmsolutions (ZFS) then launched its "Karz Mukt Kisan" program. "Karz Mukt Kisan" translates into "Debt Free Farmer"¬ without forgoing his need for timely farm operations. The KMK program is multi- pronged. In addition to making equipment available on a hiring basis it also encourages conservation of water and the improvement of soil. It does so by making implements like laser levelers, sub- soilers and reversible ploughs available to the common man. Such equipments were traditionally out of reach of the common farmer due to their high costs. The ability to hire such equipment instead of having to buy it has increased their adaptability manifolds. Zamindara Farmsolutions has acquired ISO 9001 certificate and is operating all over the Malwa region. Zamindara farm solutions covers the entire agriculture spectrum-inputs, implements traditional / Hi tech and farm management. They provide the services like Earthmovers, Power Generator Sprayers, Laser levelers, Rotary Tillers, Tippers, Combine Harvesters, Straw reapers Shredders, Cultivators, Disc Harrows, Tractors 10 to 70 H.P. Reversible MB Plough, Shrub Master, Pit Diggers, Organic farming & vermi culture, Irrigation system / water management, Farm labour training and complete farm management.

Their mission is to go beyond profits and hence they have launched India's first privately operated farmer oriented call center (099151-84000) with a significant social impact. They cover about Water Management program in over 16000 acres per year. With the experience of senior Ahuja of 5 decades and 35000 tractors delivered, now the company has transformed itself into a large supplier of agriculture goods and services. It operates, one of the largest equipment bank, one of its kind, in India, addition to acting as a' facilitator' who brings agriculture suppliers and farmers together. Zamindara Group has been on the cutting edge of Agriculture business and now they are planning to go into value addition to guava with the technical support of CIPHET.

L to R Dr. R.T. Patil, Director, CIPHET; Dr. Meshram, Jt. Commissioner, GoI; Er. Kataria, Jt. Director (Agril), Punjab; Mr. Vikram Ahuja; Mr. Surinder Ahuja and Dr. S.K. Tandon, ADG (Engg.), ICAR.

ADG (Engg.), ICAR, Director, CIPHET and Jt. Commissioner Machinery visiting the field centre of Zamindara Farmsolutions

Upcoming Events

1) ICAR sponsored Winter School on "**Quality assurance and shelf-life enhancement of fruits and vegetables through novel packaging technologies**" will be held at CIPHET, Ludhiana during September 25 to October 15, 2009. The Course Director is Dr. D. R. Rai, Principal Scientist & I/C Head Transfer of Technology Division. You can contact him on Tel : 0161-2313123, 0161-2819934(R), 9417366034 (Cell), Fax: 0161-2308670, E-mail : d_r_rai@yahoo.com, drrai66@gmail.com

2) ICAR sponsored Winter School on "**Recent developments in post harvest processing and value addition to livestock produce**" will be held at CIPHET, Ludhiana during October 22– 11 November, 2009. The Course Director is Dr. K. Narsaiah, Senior Scientist (ASPE). You can contact him on Ph.: +91-161-2313124, 09417143925, Email: knarsan@yahoo.com

3) ICAR sponsored Winter School on "**Mathematical modeling and simulation of agricultural structure, process and product quality**" will be held at CIPHET, Ludhiana during September 3-23, 2009. The Course Director is Dr. Dilip Jain, Senior Scientist (TOT Division). You can contact him on Ph.: +91-161-2313122, 09216125933, Email: jaindilip25@sify.com

Job Opportunities

WALK-IN-INTERVIEW

Applications are invited for post of Senior Research Fellow (SRF) under **Optimization of bioethanol production parameters using paddy straw and kinnow waste sub project of AMAAS** at Central Institute of Post-Harvest Engineering and Technology, Ludhiana (Punjab). The appointments will be purely temporary on contractual and co-terminus basis, following the prescribed procedure for a period of six months or till completion of the project. The appointment may be terminated at any time without notice or assigning any reason thereof.

Position	No. of positions	Qualification	Date and venue of interview
Senior Research Fellow (SRF)	One, CIPHET, Ludhiana	i) **Essential** : MSc (Microbiology, Fermentation Technology/Food Microbiology /biotechnology /biochemistry/food technology) ii) **Desirable :** Experience in different aspects of fermentation technology and protein characteristics. Working knowledge of Computer.	**12.06.2009** **11:00 am** **at CIPHET, Ludhiana**

Terms and Conditions:

1. Emoluments for SRF (Senior Research Fellow) Rs. 12000/- (consolidated) + HRA as per ICAR rules.
2. Age limit for SRF is 35 years form men and 40 years for women (relaxation in age in case of SC/ST/OBC as per Government norms).

3. The appointment will be purely on a temporary under contractual and conterminous basis, following the prescribed procedure till completion of project. The appointments may be terminated at any time without notice or assigning any reasons thereof.
4. No TA/DA will be paid for attending the interview.
5. The applicants must bring with them original documents at the time of interview and No objection certificate from the employer in case he/she is employed elsewhere.
6. Canvassing in any from will lead to cancellation of candidature.
7. The decision of Director, CIPHET would be final and binding in all aspects.

Eligible candidates may send their application through Mail/Registered post on plain paper along with bio-data with attested passport size photograph affixed on it and copies of certificates if any, to Dr. Harinder Singh Oberoi, Principal Investigator, CIPHET, P.O. – PAU, Ludhana – 141 004 (Pb.) and attend the WALK-IN-INTERVIEW as per above schedule at Central Institute of Post Harvest Engineering and Technology, Behind Radhaswami, Satsang, Hambran Road, PAU Campus, Ludhiana

Mail: hari_manu@yahoo.com, vkbciphet@gmail.com

Note: Kindly circulate among Departments/Students/Notice board please.

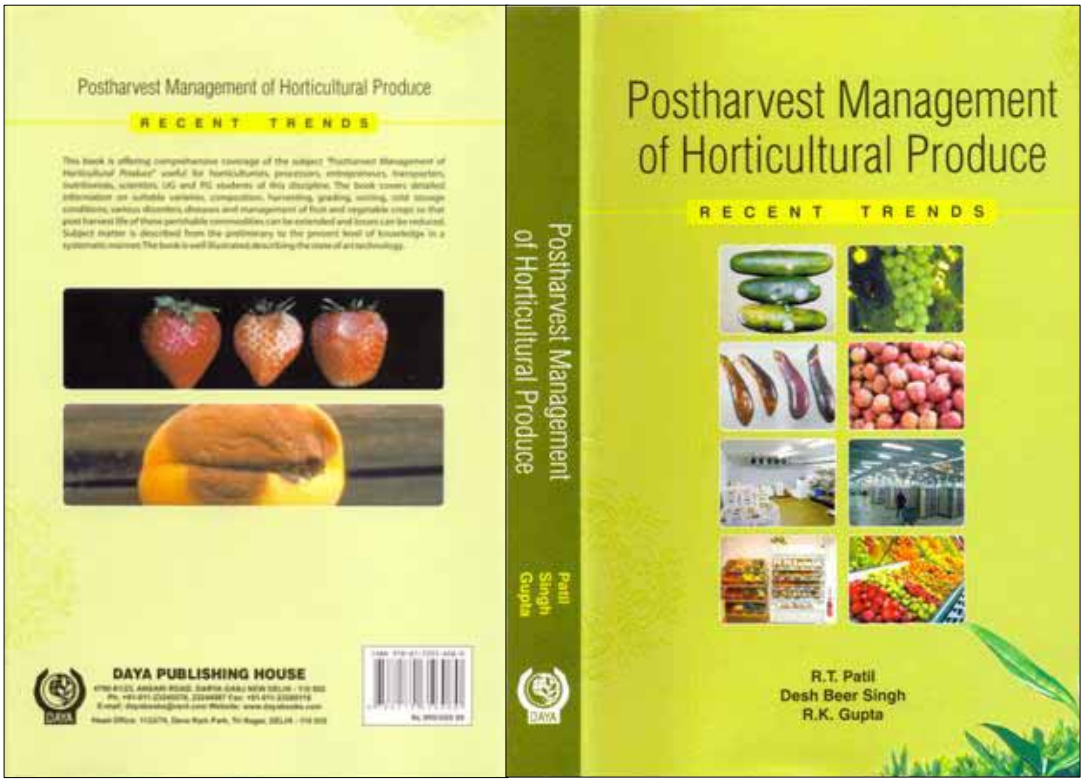
Technology of the month

System for Live fish storage

Sherpur (Ludhiana) is the biggest and important live fish market in northern India. Farmers bring live fish (20 – 30 ton daily) from different parts of Punjab and Haryana. For bringing the live fish they use truck, matador and tractors trolley etc. Farmers bring their fish to the market in noon hours and sell it by the evening. The problem arises with the remaining fish, as there was no arrangement for storing fish up to next day. The major species available on the markets include Indian Major Carps, Silver carp, Bighead, Grass carp, Common carp, and Catfishes. The supply of these species was abundant as the middle class generally accepts the market prices. During the winter season the availability of fish was more. Fish was distributed to other market and small towns from the Sherpur market. Therefore, the storage system for live fish with aeration was designed and developed at CIPHET and was tested for a year at the site of Fish Merchant, Mr. Mukesh Kumar in Ludhiana. The live fish storage system consists of blower with pressure regulator and air filter, FRP tanks, diffuser stones, and regulator and distribution pipe assembly. The staff of fish merchant were educated on how to keep the live fish, how the clean, well oxygenated, uncontaminated, and un-chlorinated (small quantities of chlorine can kill fish) water should be used. To keep live fish for market purpose, the storage 20 l of water is required per 5–8 kg fish for a few days. The installed capacity of fish storage was 350 kg and can be used even in bigger markets, however the merchant could store only the surplus of his sale. It can be observed that by running the aeration system the mortality of fish were nil with all the variety for 24 hours of storage. The temperature of water remained almost steady for 24 hours of storage against the change in ambient temperature. The pH of water increased with the 24-48 hours of storage from 6.7 to 8.6. The total dissolved solids (TDS) also increased with duration of storage from 0.44 to 0.800 mg l^{-1} and depend upon the variety of fish storage. The cost of the system designed by Dr. Dilip Jain, Sr. Scientist in association with fisheries scientist works out to Rs. 30,000.00 approx for 200kg capacity storage. The cost of storage works out to Rs-1.50/kg for 24 hours and the price difference in the cost of Live and dead fish is almost 50% (Rs. 90.00 for live fish against Rs. 60.00 dead iced fish). The efforts are being made to motivate other fish traders also to install such facility so that losses could be minimized and profitability of fish trader and fish farmer is increased.

Live fish storage system designed by CIPHET installed in fish market of Ludhiana

Publication of the month



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