



Central Institute of Post Harvest Engineering & Technology Ludhiana

OUR SLOGAN: PRODUCE, PROCESS AND PROSPER

**CIPHET E – Newsletter for July, 2009
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Director's Column



Dear All,

This month our organization, the Indian Council of Agricultural Research (ICAR) completed 80 years of its existence and celebrated 81st birthday. The ICAR formerly known as Imperial Council of Agricultural Research established in 1929 has played a pioneering role in transforming India from food importers to food exporters by ushering Green and Yellow revolutions in the country. The ICAR has played a pivotal role in changing India's status from a food-deficient country to one of the world's leading agricultural productive nations. India has witnessed significant increase in production of food grains (the green revolution), oilseeds (the yellow revolution), milk (the white revolution), fish (the blue revolution) and fruits and vegetable (the golden revolution).

However, in the recent year, the agricultural productivity is not growing as desired. To meet the food requirement of growing population, intensification of agricultural activities for increased production from minimum resources and reduction of losses by proper post harvest management are the only options available to meet the food, fodder fuel & fiber in requirement of human and livestock population of the country. Intensification has put enormous burden on the natural resource base which is already degraded and under threat. Conservation Agriculture (CA) offers an option of enhancing productivity in an eco sustainable manner while preserving the natural resource base. These issues were stressed upon in the National Meet on Conservation Agriculture organized at NASC on July 17, 2009.

The livestock play an important role in the agrarian economy of most of the developing countries such as India because of small land holdings and a large percentage of rural population possessing no land. As much as 70 per cent of the rural poor depend on livestock to some extent. It also provides subsidiary occupation in semi urban areas and more so for people living in hilly, tribal and drought prone areas where crop output may not sustain the family. The low cost production of cattle feed in the production catchment is therefore a necessity. At CIPHET an effort has been made to develop cattle feed, by utilizing the waste potato pulp from industry.

This month we are flashing the technology of processing green chili into green powder and puree. If green chili is processed immediately after harvest in the production catchments it would avoid the lengthy drying and deterioration during drying and reduce the post harvest losses. The process yields puree as well as powder and hence we can get the powder with less pungency but having all nutritional properties in tact. This diversified value added product from chili opens up new avenues for production catchment processing. The process and equipment required are simple to handle and easy to maintain the quality and safety of the produce.

With best regards

**R.T. Patil
Director**

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Foundation Day of ICAR

Director CIPHET, Dr. R. T. Patil attended the 81st Foundation Day of the Indian Council of Agricultural Research (ICAR) was celebrated on July 16, 2009. The ICAR formerly known as Imperial Council of Agricultural Research established on July 16, 1929. The ICAR has played a pioneering role in transforming India from food importers to food exporters by ushering Green and Yellow revolutions in the country. The scientific research on agriculture and allied fields carried out by the ICAR is ever increasing covering various areas starting from soil and water productivity, crop improvement, livestock management to post-harvest management and value-addition. This implies that ICAR is focused not just on increasing agricultural productivity but also on improving lives of agricultural families. The ICAR has played a pivotal role in changing India's status from a food-deficient country to one of the world's leading agricultural productive nations. On this occasion the Union Agriculture Minister, Hon. Shri Sharad Pawar addressed the scientists of the Indian Council of Agricultural Research (ICAR) and lauded the contributions made by the agricultural research and education institutions in the country. He said that since Independence, India has witnessed significant increase in production of food grains (the green revolution), oilseeds (the yellow revolution), milk (the white revolution), fish (the blue revolution) and fruits and vegetable (the golden revolution) and all these became possible due to application of cutting-edge-technologies coupled with positive policy support and hard work of farmers. Dr. G. Madhavan Nair, Secretary Department of Space and Chairman of ISRO, delivered ICAR Foundation Day Lecture, highlighting the achievements of space technology applications for development of agriculture in India. The foundation ceremony was attended by Dr. Mangala Rai, Secretary, DARE and DG, ICAR. The vote of thanks was proposed by Shri A K Upadhyay, Special Secretary, DARE and Secretary, ICAR.

ICAR Director's Conference and National Meet on Conservation Agriculture

Director, CIPHET also attended the Directors Conference in the afternoon of July 16, 2009 and later a National Meet on Conservation Agriculture (NRM) organized at NASC, New Delhi on July 17, 2009. Intensification of agricultural activities for increased production from minimum resources and reduction of losses by proper post harvest management are the only options available to meet the food, fodder fuel & fiber in requirement of human and livestock population of the country. Intensification has put enormous burden on the natural resource base which is already degraded and under threat. It would also contribute to global warning if the "business as usual" approach is followed. Conservation Agriculture (CA) offers an option of enhancing productivity in an eco sustainable manner while preserving the natural resource base. In the conference following presentation were made, which stressed upon the production agriculture using minimum of the resources or in other words adopting the cultivation practices such that they use the resources with at most efficiency and thus increase production per unit of the input to maximum extent.

1. Brief on 4th World Congress on CA and Socio Economic Issues in CA – Dr. P.K. Joshi, Director, NCAP.
2. Research agenda for enhancing resource productivity through CA – Dr. Raj K. Gupta, Head of CIMMYT India office, Dr. R.K. Malik, Professor, CCS HAU.
3. Research agenda for Genetic improvement in CA – Dr. S.P. Tiwari, DDG (Education).
4. Mechanization for CA – Dr. S.K. Rautaray, Former Project Coordinator,UAE, CIAE, Bhopal.

5. Research agenda for Natural Resource Management in CA – Dr. I.P. Abrol, Director, CASA.
6. General Discussion for Setting Overall Research Agenda.

National Institute of Rural Development Students visit CIPHET

A group of about 20 students of Post Graduate Diploma in Rural Development Management being offered at NIRD, Hyderabad visited the Abohar Campus during 9-10th July 2009 as a part of their Field Visit. The students have been exposed by the various research activities as well as various pilot plants of the Campus. Besides, they have been show, Punjab Agro Juices Limited as well as the Royal Kinnow Grading and Waxing Plant at Abohar. Dr. R.K. Gupta, Head, HCP coordinated the field visit.



Rural development students interacting with Head HCP



Filed visit to Kinnow juice factory



Students being demonstrated kinnow processing plant at CIPHET Abohar

CIPHET scientists attend Management Development programme at IIM, Lucknow

Dr. SN Jha, CPI, Dr. RK Gupta, CPI and Dr. S. Balasubramanian, Co-PI of different NAIP projects of this Institute participated in a training program entitled ‘Management development programme on Public-Private Partnership for innovation in agriculture’ was held at IIM, Lucknow during 19-25 July 2009. This training envisaged the concept and evolution, social aspects, economics, agricultural service management, legal issues, macro and micro finance aspects, negation and conflict management, etc., in relevance with Public-

Private Partnership. attended Management Development Programme on Public-Private Partnerships for innovation in Agriculture during 20-24th July 2009 at IIM, Lucknow. The programme was organized under the learning and Capacity Building component of NAIP. The course included PPP: concept and Evolution, Economics of PPP, PPP in agriculture Service Management, Legal issues in PPP, Financial aspects of PPP, Negotiations and conflict management in PPP projects, Partnering across Agriculture supply chain and field visit. A group of 25 participants from various organizations attended the programme.



Participants of MDP programme

Commercial manufacture of whey based fruit drink based on CIPHET technology

Large quantity of soybean milk whey is produced during preparation of soy-*paneer* and it goes waste. Soybean milk whey based ready-to-serve (RTS) beverages were developed and evaluated. The properties of soybean milk whey were evaluated for its utilization for preparing RTS beverages.

Characteristics of soybean whey: Titratable acidity, protein and total reducing sugar of whey were observed to be 0.192, 0.3 and 0.4 % respectively. pH, average specific gravity and viscosity of the freshly prepared soybean whey were observed to be 5.11, 1.01 and 20.5 cP. Colour of the whey was yellowish red. The L^* , a^* and b^* values of the whey were in the range of 32.02 – 40.35, 3.03 – 4.56 and 19.58 – 22.27 respectively. The turbidity of whey was 82.37 NTU.

Preparation of RTS beverages: RTS beverages were prepared by adding sugar, fruit juice / pulp, citric acid and preservatives to the whey. Different compositions were tried with guava, mango and pineapple. The soybean milk whey could be used upto 30 % by weight due to its typical aroma. pH, titratable acidity, TSS and sensory score of the RTS samples was observed

to be in the range of 3.71 – 3.85, 0.25 – 0.37 %, 14.2 – 19.8 °Brix, 7.12 – 8.5 respectively. The microbial load of RTS samples after 15 days of storage was observed to be $1 - 2 \times 10^6$ /g fungal colonies and no bacterial contamination. The utilization of soybean milk whey for RTS beverages enhances the nutritional value of the beverages by providing the benefits of phyto-chemicals available in the whey.



Soybean whey based guava RTS beverage



Soybean whey based pineapple RTS beverage



Soybean whey based mango RTS beverage



Mr. B. S. Garcha receiving the licensing agreement from Director, CIPHET.

The technology has been licensed to Mr. B S Garcha, proprietor B K Soy Products, V&PO Deh Kalan Distt Sangrur, Punjab. The beverages are being commercially manufactured by his

unit. Mr Garcha was provided hands on training on manufacturing of whey based beverages at CIPHET, Ludhiana.

CIPHET develops feed processing facility with NAIP funds

The livestock play an important role in the agrarian economy of most of the developing countries such as India because of small land holdings and a large percentage of rural population possessing no land. As much as 70 per cent of the rural poor depend on livestock to some extent. It also provides subsidiary occupation in semi urban areas and more so for people living in hilly, tribal and drought prone areas where crop output may not sustain the family. India ranks first in the world with its milk production of 88.1 million tonnes (2003-04). Indian dairy industry has been showing a consistent growth rate of about 5% per annum. Dairy sector is also making valuable contribution to exports. The liberalized economy together with the opening of processing activity to private sector offers large scope for dairy industry in the coming years. With this background, it is evident that quality cattle feed will always be in demand in our country, which is the leading milk producer of world.

At CIPHET an effort has been made to develop cattle feed, by utilizing the waste potato pulp from industry. The BIS specifications of cattle feed require that the moisture content of compound cattle feed should not exceed 11 %. The protein and crude fibre content of feed should be 20-22 and 7-12 % respectively. The cattle feed should provide 5000 IU/kg of vitamin A and minimum 0.5 % by mass of calcium and 0.5 % by mass of phosphorus on moisture free basis.

Cattle feed processing technology: The raw materials required for cattle feed are cereal grains and its by-products, oilcakes and meals, tubers and roots and other food processing by-products such as molasses. The required ingredients ground and mixed thoroughly, as per the recipe. The mixture is then pelletised using horizontal or vertical pelletisers. The typical machines which are required for producing cattle feed pellets as per BIS requirements are pulveriser (for size reduction), blender (for mixing the ingredients) and pelletisers (for converting the mixture into pellets). The machines and the pellets prepared are presented in figure below. The pellets contain barley (35 %), maize (20 %), potato pulp (15 %), mustard oilcake (20 %), husk (9%) and mineral mixture (1 %). The analysis of pellets revealed that these meet BIS specifications. Further trials are in progress.





Vertical Pelletiser



Horizontal pelletiser



Cattle feed pellets

Award



Dr. S. Balasubramanian, Sr. Scientist, Food Grains and Oilseeds Processing Division, has been awarded with a coveted Jawaharlal Nehru Award-2008 for his Doctoral research entitled 'Studies on pearling and development of pasta from selected minor millets'. Dr. S. Balasubramanian was honored with this award on the occasion of ICAR foundation day, was held at NASC Complex, New Delhi on July 16, 2009. This award constitutes certificate, citation, gold metal and Cash award of Rs. 20,000/-.

Upcoming Events:

1. 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 Tel: +91 - 161-2313122, 09216125933, Email: jaindilip25@sify.com Fax: 0161-2308670.
2. 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, Agricultural Structures & Environmental Control Division. You can contact him on Tel: +91 - 161-2313123, 0161-2819934 (R), 09417366034 (Cell), Fax: 0161-2308670, Email: d_r_rai@yahoo.com, drrai66@gmail.com.
3. 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 to November 11, 2009. The Course Director is Dr. K. Narsaiah, Senior Scientist (ASPE). You can contact him on Tel: +91 - 161-2313124, 09417143925 (Cell), Email: knarsan@yahoo.com Fax: 0161-2308670.

Job Opportunities

Walk in Interview:

Eligible candidates are invited to attend walk in interview for the position of RA under Institute Technology Management Unit (ITMU) and under NAIP project “Mobilizing mass media support for sharing agro-information” at CIPHET (ICAR) Ludhiana, on **07.09.2009 at 11.00 AM.**

RA under Institute Technology Management Unit (ITMU)

Educational Qualifications: Ph.D. degree in Agricultural Structures & Process Engineering/Post Harvest Engg./ Processing and Food Engg./Food Science and Technology/Agribusiness Management with Agril. Engg. as first degree OR Master’s Degree in any of the above disciplines with 1st division or 60% marks or equivalent OGPA/OCPA with at least two years of research experience.

Emoluments: Rs. 18,000/- per month + HRA for Ph.D. & Rs. 17,000/- per month + HRA for Master’s degree.

Age limit: 40 years for men and 45 years for women in case of RA on the date of interview.

The above positions are purely temporary and will be filled on Contractual basis. The selected candidates shall have no right/claim for regular appointment at this institute as the posts are purely temporary. Interested candidates may attend walk-in-interview on the date as indicated along-with original certificates and typed bio-data with one set of attested copies of their certificates with passport size photograph. No TA/DA will be paid for attending the interview.

RA under NAIP project “Mobilizing mass media support for sharing agro-information”

Eligible candidates are invited to attend walk in interview for the position of RA under NAIP project “Mobilizing mass media support for sharing agro-information” at **CIPHET (ICAR) Ludhiana, on 07th September 2009 at 11.00 AM**

Educational Qualifications: i) Masters degree in mass media / journalism / mass communication / media studies with minimum 60 % marks from recognized university as regular student. ii) Minimum two years experience in a reputed publication / media house / news agency / production house as evident by published papers in magazines and leading news papers or telecast / broadcast stories.

Desirable Qualifications: Proficiency in spoken and written English and / or Hindi (or regional language as per project area) with experience of using media related softwares.

Emoluments: Rs. 17,000/- per month + HRA for Master's degree.

Age limit: (as on May 31, 2009) below 35 years for men and 40 years for women. Relaxation of five years for SC / ST candidates and 3 years for OBC candidates are permissible in case of RA on the date of interview.

The above positions are purely temporary and will be filled on Contractual basis. The selected candidates shall have no right/claim for regular appointment at this institute as the posts are purely temporary. Interested candidates may attend walk-in-interview on the date as indicated along-with original certificates and typed bio-data with one set of attested copies of their certificates with passport size photograph. No TA/DA will be paid for attending the interview.

Technology of the Month

Green Chilies Products Processing

India produces 11,85,500 tons of Chilies from 7,37,500 hectare of land, and exports 81,500 ton. The consumption of Chilies is also very high in India. The time and stage of harvesting of Chilies is governed by the purpose for which it is being used. The fruits are harvested when they are fully developed at green and the red ripe stage. The different stages of ripeness also contribute to variation in color and pungency level of fruit. Capsaicin has significant physiological action which is used in many pharmaceutical preparations like ointments for cold, sore throat, chest congestion etc. The chilli taken with food stimulates our taste buds and thereby increases the flow of saliva which contains amylase enzyme which helps in digestion of starchy or cereal foods.

Processing of green Chilies has vast potential as it would avoid lengthy drying operation and reduces losses and also can provide the Chilies powder with higher nutrition and controlled pungency. The green Chilies have more Vitamin C & A and antioxidant properties. The characteristic color of the dried green Chilies is one of the essential quality indicators. The non enzymatic browning and chlorophyll loss during drying contributes substantially to color loss in green Chilies. At CIPHET, a process has been standardized for making green Chilies powder and puree. About 130 g of green Chilies powder and 300 ml puree could be prepared from one kilogram of fresh green Chilies. The financial evaluation was carried out for the processing 200kg of green Chilies per day. The estimated cost of plant and machinery would be Rs. 713000/-. Considering the raw material cost at Rs. 15/kg of green Chilies, the cost of green powder (100g dry weight) at Rs. 120/kg, and the cost of puree (600g) or Chilies sauce at Rs. 100/kg, the break even point comes to be 49.15% and pay back period 1.91, which indicates the viability of the project. From 1kg of green Chilies costing Rs. 15/-, the value added product of Rs. 70/- could be marketed.



Fresh green Chilies



Puree out of green Chilies



Chilies powder from green Chilies

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