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

CIPHET E – Newsletter for February 2007
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Director's Column

Dear All

The objective of CIPHET is to see that scientific post harvest management and value addition is introduced to as many crops and commodities as possible and that too in catchment areas so that fruits of value addition are passed on to the farmers. This can be done effectively only with the active collaboration of commodity institutes and scientists located there. In this direction we have started a collaborative project with NRC for Seed Spices so simple but essential concept of (primary processing) cleaning and grading is introduced. Another break through research CIPHET scientists have conducted is on technology package to reduce the cracking of pomegranate in semi arid region. I hope that this technology with little changes can be tried in other regions to get the solution to this acute problem.

Another important event this month was Research Advisory Committtee meeting at CIPHET. The learned members namely Prof. BPN Singh, Dr. R. P. Kachru, Dr. P. Chandra, Dr. PK Chattopadhyay, Dr. PK Srivatstava and Dr. B. Ranganna provided a critical evaluation and proper guidance for our research programmes. The major outcome of this meeting was their recommendation that CIPHET should now take active research under two new divisions of Livestock & Aquacultural Products Processing and Commercial Crops Processing which was under planning since 9th Plan. They also suggested that a thorough discussion and brain storming be held at CIPHET so that division of Biotech Engineering could be started at CIPHET in future where engineering interventions in bio technology could be addressed.

Another important event at CIPHET was holding of CCM of AICRP on PHT. Major decision during this meeting was to start a project on collecting information and creating database on the food processing industries in all states of India so that this data can be used for policy decisions on improving status of food processing industry in the country.

CIPHET is striving hard to impart practical knowledge on modern methods of processing and quality and food safety issue to entrepreneurs through technology based EDP program and this month the programme were on Kinnow processing and Low cost poly houses for high value crops. We are receiving many enquiries from different parts of country and we will plan more and more EDP programmes so that technology can be adopted as an enterprise in production catchment. In this cause help received from all of you is gratefully and sincerely acknowledged.

With best regards.

R.T. Patil
Director

Events:

1. Visits of Dr. R.T. Patil, Director-CIPHET to NRCSS

The post harvest management of seeds spices and their value addition offers great scope for rural agro entrepreneurship in Rajsthan and Gujarat. Simple cleaning and grading itself can add five folds value to raw material. However it is not possible for each farmer to own such precision machines and hence this high value produce is sold as raw only after threshing. In view to introduce appriiate post harvest technologies for processing of seeds spices Dr. R. T. Patil, Director, attended National Seminar on "Production, development, Quality and Export of Seed Spices" Issues and Strategies" organized at National Research Centre on Seed Spices, Ajmer during February 2-3, 2007. Dr. A. Alam, Vice Chancellor, SKUAT also attended this meeting and The major recommendation in the area of Post Harvest were as follow:

1. Joint research (CIPHET-NRCSS) may be initiated on whole seed extraction of seed spices to produce mild curry powders and also get high value essential oils for commercial exploitation
2. The mobile agro processing unit housing the thresher, cleaner, grader and destoner may be popularized in seed spices growing areas.
3. At NRCSS, Post Harvest management and VA of seed spices may be followed using modern equipment so that it can serve as training and demonstration facility to rural entrepreneurs
4. An Entrepreneurship Development Program of one-week duration may be started at NRCSS in collaboration with CIPHET for upcoming entrepreneurs.

2. Visits of Dr. R.T. Patil, Director-CIPHET to Karnal and Yamuna Nagar

Dr. R. T. Patil addressed the students of Food Technology from Doon Valley Institute of Engineering & Technology, Karnal.on "Advances in Food Processing Engineering Technology & Opportunity" on 9th February, 2007. On the same day, in the afternoon lecture on "Health benefits of soybean and importance of Value Addition in Daily Diet" was delivered for 200 students of Guru Nanak Khalsa College at Yamuna Nagar to convince them about the importance of processed food in general and soy products in particular in maintaining proper health.

3. CIPHET organizes training program for Horticultural Officers of UP

A 5 days training programme entitled "Establishment of Small and Large Scale Mentha Distillation Unit, Turmeric Curing and Establishment of Post Harvest Technology Infrastructure such as Integrated Pack House, Refer Van and Cold Storage and Training on its Application" during 24-28 February, 2007 was organized at CIPHET, Abohar for Horticultural Officers from Uttar Pradesh. Director, CIPHET was the chief guest and Dr. P.S. Aulakh, Director, PAU Sub-centre was Guest of Honor. The particiaqnts were exposed all technologies developed and adopted at CIPHET Abohar for post harvest mamnagement and value addition were explained to them through lectures and demonstrations of the technology.

4. Participation in SOLARIS 2007

Dr. Dilip Jain, Sr. Scientist participated in the 3rd International Conference on Solar Radiation and Day Lighting, SOLRIS- 2007 held during 7-9 February 2007 at Indian Institute of Technology, New Delhi and presented the two research papers titled "Solar energy based thermal model for prediction of wheat grain temperature under covered and plinth storage" and "Study the kinetics solar drying of mango pulp".

5. CIPHET hold its RAC meeting

The Research Advisory Council Meeting of CIPHET was held during 19-21 February 2007 under the chairmanship of Rtd. Prof. B.P.N. Singh. Dr. P. Chandra, ADG (PE) from the Council participated in this meeting. Overall progress of the Institute was presented to the RAC members by Dr. R.T. Patil, Director, CIPHET which was followed with the Action Taken Report by Dr. S.K. Nanda, Member Secretary. Outcome of the concluded research projects as well as expectations from new programmes were discussed division-wise. The RAC members also held discourses with the Director, HoDs and concerned scientists of CIPHET on establishing new Divisions and the thrust areas in R&D to be undertaken during the XI Plan.

6. CIPHET hosts CCM of AICRP on PHT

The Coordination Committee Meeting of All India Coordinated Research Project on Post Harvest Technology was organized during February 26 to 28, 2007 at CIPHET, Ludhiana. The meeting was co-hosted by Punjab Agriculture University, Ludhiana centre. Dr. Pitam Chandra, ADG (PE) ICAR, New Delhi chaired the meeting and Dr. R.T. Patil, Director CIPHET was Co-chairman. Dr. S.K. Nanda, Project Coordinator (PHT) coordinated the meeting. Research engineers and scientists from 33 centres of AICRP on PHT from all over the country participated in the meeting. The research engineers of the respectively centres presented the technical programme for 2007-08. The

research programmes and budget requirement in the forthcoming eleventh plan were discussed for each centre. Major decision during this meeting was to start a project on collecting information and creating database on the food processing industries in all states of India including the investment made, manpower employed so that this data can be used for policy decisions on improving status of food processing industry in the country. It was also felt that AICRP on PHT has developed many useful equipment for processing of various products in catchment areas and there is a need for effective and precise multiplication of these machines for adoption at other centers and other regions. Hence CIPHET volunteered to take up the responsibility for multiplication and testing of such machines so that they can be easily available for FLD activities.

7. EDP on Construction, operation and management of covered cultivation

A 5-day Entrepreneurship Development Programme (EDP) on "**Construction, operation and management of covered cultivation for high value crops**" was organized at CIPHET, Abohar w.e.f 5-9 February 2007. Four participants from Rajasthan and West Bengal attended the training. Two polyhouses were constructed during the training. The trainees were trained on different aspects of cultivation under protected conditions with more emphasis on practical. The participants were also exposed to different polyhouses and other protected cultivation practices at farmers field. During the training, one manual on construction and management of protected cultivation was also released by the course coordinator, Dr. Rajbir Singh.

Structure development by trainees

polyhouse constructed by trainees

Project Profile: Modern Stone Flour Mill (Commercial)

1. BENEFIT COST ANALYSIS

The benefit cost analysis of the project has been done on the basis of following data and assumptions:

- Average capacity of wheat milling unit: 50 metric ton / month (75 % of the rated capacity; 67 metric ton / month)
- Recovery: 94 % whole-wheat flour and 5 % bran.
- Monthly repair and maintenance charges: 1 % of the cost of machines.
- Depreciation on machines and equipment: 10 % p.a.
- Depreciation on furniture and tools: 20 % p.a.
- Rate of interest: 11% p.a.
- No. of working days in a month: 25
- Total no. of working days in year: 300
- Working hours per day: 8
- Capacity utilization: 1st year 50%; 2nd year 60%; 3rd year 70%; 4th year 80 %; 5th & subsequent years 90%.

The detailed calculations are presented as under:

1.1. Fixed Capital

Land & Building (250 m^2) Rs 5,00,000

Cost of machinery & equipment including electrical installation and furniture Rs 3,60,000

1.2. Working Capital (per month)

Labour	Skilled worker (one)	Rs. 3,000
	Unskilled worker (two) @ Rs 2000/-month	Rs. 4,000
Raw Material	Wheat 50 tonnes @ 9000/- tonne	Rs. 4,50,000
	Packaging Material	Rs. 5,000
Electricity Charges	3000 kWh @ Rs. 4.75 per kWh	Rs. 14,250
Other expenses	Telephone	Rs. 500
	Repair & Maint. (1% of cost of machines)	Rs. 3,500
	Transport charges	Rs. 5,000
	Total	**Rs. 4,85,250**

Working Capital (for 45 days) Rs 4,85,250 x 1.5 = Rs. 7,27,875

1.3 Total Capital Investment

Fixed Capital		Rs. 8,60,000
Working Capital for 45 days		Rs. 7,27,875
	Total	**Rs. 15,87,875**

1.4. Annual Cost

Total working capital	Rs. 58,23,000
Dep. on m/c & equipment (@10% p.a.)	Rs. 32,500
Dep. on furniture (@20% p.a.)	Rs. 2,000
Interest on total capital investment @11 %	Rs. 1,75,000
Total	**Rs. 60,32,500**

1.5. Total Sales (per annum)

Wheat Flour, 565 tonnes @ 11,000 / tonne	Rs. 62,15,000
Bran, 30 tonnes @ 5500 / tonne	Rs. 1,65,000
Total	**Rs. 63,80,000**

1.6. Profitability (per annum)

Annual Profit =Annual Sales – Annual Cost =Rs. 63,80,000 - Rs.60, 32,500 = Rs. 3,47,500

Profit on sale = 5.45 %

Return on capital investment = 21.88 %

1.7. Break Even Point (B.E.P.)

Fixed Cost

(i)	Interest on total capital investment @ 11%	= Rs. 1,75,000
(ii)	Depreciation	= Rs. 34,500
(iii)	40% of annual wages= 0.4x7000x12	= Rs. 33,600
(iv)	40% of overheads (incl. utilities)	= Rs. 1,11,600

Fixed cost = (i)+(ii)+(iii)+(iv) = Rs. 3,81,900

B.E.P. = (3,81,900 / (381900+347500)) * 100 = 52.35 %

LIST OF CIPHET PUBLICATIONS / TECHNICAL BULLETINS / PROJECT PROFILES/PUMPHLETS.

Sr. No.	Year	Author's	Title of Technical Bulletin / Project Profile.	Price Fixed (Rs.)
1.	1995	Jai Singh	Technical Bulletin on Grass and Fodder Harvesting and Processing Machinery.	50.00
2.	1995	Jai Singh &Prasoon Verma	Status of Pulse Milling in India	50.00
3.	1995	Jai Singh & Prasoon Verma	Post Harvest Technology of Oilseeds.	50.00

4.	1999	V. K. Mehen	Supply Aflatoxin Free Groundnuts and Groundnut Products - A Real Challenge.	50.00
5.	1999	V. K. Mehen & B.S.Bisht	The Aflatoxin Problem in Groundnut and it's Management.	50.00
6.	2000	V. K. Mehen	Methods for the Analysis of Aflatoxins in Agricultural Commodities.	75.00
7.	2000	D. Mridula & B.S.Bisht	Food, Facts and Diets.	200.00
8.	2003	Mridula D. et al.	Techno – Economic Facets of Sattu Processing Units.	100.00
9.	2003	V. K. Mehen	Technologies for Post Harvest Management of Aflatoxin Contamination in Groundnuts and Groundnut Products	150.00
10	2003	S.M.Ilyas et al.	Reduction in Post Harvest Losses of Tomato	100.00
11	2005	Rajbir Singh et al.	Package of practices Strawberry cultivation	100
12	2005	R.K. Vishwakkarma et al.	Processing of Guar Gum and its uses.	50.00
13	2005	S.M. Ilyas et al.	Entrepreneurship Development through Agro-Processing Centre in Production Catchments.	50.00
14	2005	D.K. Bharti et al.	Economics of Agro-Processing Centers/Units in Punjab, Haryana and western Uttar Pradesh.	100.00
15	/2005	Ashwani Kimar et al.	Green House Technology for Vegetable Production in cold Desert Region.	100.00
16	2005	R.K.Goyal etal.	Pulse Milling Technologies.	150.00

Promotions: Dr. D.K. Bharti Scientist (Agril Economics) promoted as Sr. Scientist from Scientist (Sr. Scale) through CAS w.e.f. 12-07-2006

Technology of the month

CIPHET develops a technology to control cracking in pomegranate

Quit a large area has come up under pomegranate cultivation in Rajasthan, Punjab and Haryana and there is further scope for its expansion in adjacent areas. The main problem in this fruit crop in this region is cracking of fruit at maturity stage to the extent that 25-40% crop is lost.

The CIPHET scientists studied the mechanism of this problem and found that this is due to mainly following reasons

- Deficiency of boron in plants causes cracking of fruits at immature stage.
- Drought/dry spell followed by severe irrigation.
- Severe irrigation followed by dry spell.
- Too much fluctuation in day night temperature leads to cracking of fruits at maturity.

A team consisting of Dr. D.B. Singh, Er. APR Kingsly and Dr. Satyendra Kumar devised a solution by controlling the water applications and advancing the flowering and fruiting (Bahar) and spraying near maturity with 0.2% boron. Results of these experiments have resulted near negligible cracking of fruits and improvement in quality of fruit with maximum juice, TSS, vitamin C and acidity and sugars.

Picture showing severity of problem of cracking

Effect of treatment on almost complete reduction of cracking

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