

ISO 9001-9015 Organization

ICAR-CIPHET NEWS



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FROM DIRECTOR'S DESK



I am extremely elated to present the ICAR-CIPHET Quarterly Newsletter for October-December, 2019. I am delighted to inform that the institute has celebrated its 31st Foundation Day on 3 October, 2019. This issue of the newsletter covers research in the area of – disinfection of selected food grains using microwave, effect of mustard based formulation on insects, extraction of ACE -inhibitory peptide from Rohu fish waste etc. I am extremely happy to share during this period, a patent has been filed and another patent was granted for “Autoclavable microencapsulation system with multistage breakup two fluid nozzle for clean production of microcapsules”. The institute has also celebrated 150th Birth Anniversary of Mahatma Gandhi, Vigilance awareness week and Communal Harmony Campaign Week . The institute has successfully conducted one summer school and winter school, one Model Training Programme, two EDPs, one HRD training and three training programmes under SC subplan. KVK under ICAR-CIPHET has also organised many training and awareness programme during this period. The institute is highly involved in extension activities and has participated in two exhibitions/ melas to showcase and demonstrate the technologies developed by the institute.

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RESEARCH HIGHLIGHTS

- Microwave assisted disinfestation of selected food grains (rice and wheat):** Experiments were conducted using indigenous microwave oven (Type – convection; Power output – 900 watt; Power levels- 10). Commodities like rice (basmati and non-basmati) and wheat were tested. After treatment grain quality parameters like, cooking quality, alkali scoring, gluten test, etc. were also assessed. Midterm report on effect of microwave treatment on non-basmati rice has been submitted to M/s Pradeep Metals Ltd., Navi Mumbai (M.S.). The submitted data was concluded that results are encouraging with parameters like High Power level (P-HI) to treat 1Kg of grains as spread in 2cm layer on microwaveable glass plate. Preconditioning of minimum 7 minutes and the residual surface moisture after treatment can be removed by blowing air for 10 min (with fan speed 600-700 rpm).
- In non-basmati rice, mortality rates of flour beetles, rice weevils and flat grain beetles were significant at exposure of 30 to 40 seconds. Whereas, in control samples insects like rice moth, flour beetles, flat grain beetles and rice weevils were observed approximately after 02 months of storage.
- In basmati rice, mortality rates of flour beetles, rice weevils and flat grain beetles were varied significantly across different exposure periods. Effective mortality was observed under exposure of minimum 25 seconds. Whereas, insects were observed after two months of storage in control samples.



Fig 1: Dead insects in rice after treatment

- In wheat, mortality rates of khapra beetle, lesser grain borer and flour beetles were observed at exposure to microwaves for minimum of 40 seconds. There is no need for exposing grains after 60 seconds. Insects in control samples were observed after 2.5 months of storage.



Fig 2 : Dead insects in rice after treatment

- Effect of particle size on different properties of khesari seed flour:** *Khesari (Lathyrus sativus)* seed flour was prepared by grinding dehusked dal prepared from *khesari* seeds of variety Mahatiwra obtained from AICRP on PHET, Raipur (Chhattisgarh). Samples of *khesari* dal flour passed through BSS 60, 72, 85, 100, 150 and 200 (>212, >180, >150, >106, >75, and >63 μm) mesh sieves were prepared. Bulk and tapped density ranged from 0.415-0.462g/mL and 0.487-0.526 g/mL, respectively. As the particle size decreased from >212 μm to >180 μm , a significant decrease in bulk density of flour samples was observed. Tapped density of all samples was more than the respective bulk density. Carr index and Hausner ratio are the indicators of flow behaviour of flour sample and indicated good flow (CI; 12-15, HR; 1.14-1.17) for samples with particle size >212 and >180 μm . With decrease in size in all samples flow was found to be in category of fair (CI; 16-19, HR; 1.19-1.24). Water absorption capacity ranged from 75 to 95%. It was maximum (95%) for flour sample of particle size >180 μm and then declined with decrease in particle size. Oil absorption capacity increased with decrease in particle size from >212 to >106 μm and with further decrease in particle size slight decrease was observed. Swelling capacity of flour

increased with decrease in particle size upto $>150\ \mu\text{m}$. Further decrease in particle size did not affect swelling capacity.

Samples of khesari dal flour were evaluated for proximate analysis, color values and least gelation concentration. The data revealed that moisture, ash protein, and fat content ranged from 8.6-9.8%, 2.83-3.2%, 22.2-28.5% and 1.26-2.65%. Moisture, fat, ash content increased with decrease in particle size of flour sample while protein content decreased with reduction in particle size. Color values (L) increased slightly with decrease in particle size. Similar increase in b value was observed. Least gelation concentration increased with decrease in particle size and values ranged from 6-10%. Foaming capacity of flour samples was very high and ranged from 57-83% and was significantly affected by the particle size. Highest foaming stability (83.5%) was observed for flour sample in the particle range of $212\text{-}180\ \mu\text{m}$ with further reduction in particle size, foaming stability decreased.

Rapid visco analysis of flour samples showed increase in peak viscosity (PV), trough and final/ cold paste viscosity (CPV), setback viscosity (SBV) and Breakdown viscosity (BV) with decrease in particle size of the flour samples. Peak time ranged from 6.6 to 7 minutes. Pasting temperature of flour decreased with decrease in particle size.

- Bio-efficacy of developed mustard based formulation against major insect pests of cotton and pomegranate:** The developed mustard based eco-friendly formulations (EC & SC) were found effective in controlling sucking pests in cotton (thrips – 77 to 85%; leafhoppers – 64 to 84%; whitefly – 38 to 55% if used as sole; 91, 93 and 65% respectively, if used mixture), and pomegranate thrips [on and around 90% (NS)]. The formulations found compatible with one other and synergistic effect was observed in insect population control. Physical compatibility: Water soluble formulations, were not clogged with the nozzle. Formulation mix formed precipitation in the initial but later was miscible in water.



Fig 3: Physical compatibility



Fig 4: Experimental plot of cotton



Fig 5 : Recording observations

- Optimized the degree of hydrolysis for extraction of ACE -inhibitory peptide from Rohu (*Labeo rohita*) fish was brought to the lab in chilled condition and dressed to get non-edible tissues such as fins, scales, swim bladder and head. These wastes were then mixed in their natural**

proportion to get a homogenized rohu fish waste protein (RFPWP). RFPWP was hydrolyzed using protease (from *Bacillus licheniformis*) to produce rohu waste protein hydrolysate (RWP). Hydrolysis conditions were investigated using response-surface methodology for producing peptides with the highest angiotensin-I converting enzyme (ACE)-inhibitory activity. Temperature (48 °C), pH (7.1) and hydrolysis time (2 h) were found optimum with the ACE-inhibitory activity and the degree of hydrolysis of 65% and 22%, respectively. N [3-(2-Furyl) acryloyl]-Phe-Gly-Gly (FAPGG) was used as substrate for measuring the ACE inhibitory activity. FAPGG was dissolved in an assay buffer containing Tris and NaCl. Spectrometric measurement involved reading the absorbance of samples at 334 nm.

Physio-chemical analysis of wheat flour and supernatant:

Quality of wheat flour stored at two different temperatures (ambient temperature and 37°C) and supernatant of wheat flour was analyzed at 0 day and after 10 days of storage. Quality parameters like pH, total solubility solids (TSS), thermal conductivity of flour, supernatant, alcoholic acidity of flour, supernatant and peroxide value were examined and these were found to be 6.8, 3.9 (°Brix), 0.129 (w/mk), 0.490 (w/mk), 0.12 (%), 0.025 (%) and 0, respectively. Samples were infested with 25 and 50 number of insects and stored at two different temperatures (ambient temperatures and 37° C) and quality parameters of infested samples were analyzed after 10 days and results are given below:

| S. No | Parameters | Ambient Temperature | | | Temperature (37°C) | | |
|-------|--|---------------------|-------------------|-------------------|--------------------|-------------------|-------------------|
| | | Control (CA) | 25 insects (IA25) | 50 insects (IA50) | Control (CT) | 25 insects (IT25) | 50 insects (IT50) |
| 1 | pH | 6.99 | 7.06 | 6.92 | 6.94 | 6.94 | 6.96 |
| 2 | Total soluble solids (° brix) | 4.3 | 4 | 4.5 | 3.7 | 3.7 | 3.8 |
| 3 | Thermal conductivity (w/mk) | 0.566 | 0.618 | 0.682 | 0.568 | 0.595 | 0.604 |
| 4 | Alcoholic acidity (%) | 0.024 | 0.04 | 0.04 | 0.07 | 0.06 | 0.06 |
| 5 | Peroxide value (meqO ₂ /kg) | 0 | 0 | 0 | 0 | 0 | 0 |

- Effect of particle size on particle size distribution of chickpea seed flour:** The particle size distribution and specific surface area of chick pea flour samples of different particle sizes were studied using laser diffraction analysis. The results revealed that reduction in particle size, significantly decreased the 90% and 50% volume distribution of particles and showed significant ($p < 0.05$) increase in surface area. Flour samples with particle sizes of 212-180, 180-150, 150-106 μm were found to be homogeneous. SEM studies revealed that in bigger particle size flour, starch particles were oblong/ oval shaped and surrounded by protein particles. As the particles size decreased, it was possible to see the transition of oval shaped particles into rounded and short ones.
- Degree of hydrolysis for protein isolates:** Experiments on estimation of degree of hydrolysis in soybean and groundnut protein isolates were carried out. Degree of hydrolysis was also estimated for Standard BSA and casein. The DH of soy and groundnut protein isolates was found to be 18.67 and 11.23 % respectively, while the DH of standards BSA and casein was 76.08 and 5.86%, respectively.
- Antioxidant activities of Ashwagandha:** *Ashwagandha* powder was extracted using methanol. Methanolic extract was used to estimate various bioactive compounds. Analysis revealed that total phenolic content, saponin, alkaloid, flavonoid content was 2.27 mg/g, 2.4mg/g, 1.92 mg/g and 300 $\mu\text{g/g}$, respectively. The extract showed DPPH scavenging activity, which was 1.3 mg equivalent of ascorbic acid/g.

PATENTS FILED/GRANTED

GRANTED

- Patent No. 324943
A patent on “Autoclavable microencapsulation system with multistage breakup two fluid nozzle for clean production of microcapsules” with patent no. 324943 has been granted to a team of inventors led by Dr. K. Narsaiah, Dr. S.N. Jha and Dr. M.R. Manikantan of ICAR CIPHET.

FILED

- Patent was filed on “Process for producing low-fat, high-fibre processed meat products using food industry by-products”

MEETING/EVENT

- 150th Birth Anniversary of Mahatma Gandhi, was celebrated on 2 October, 2019 at ICAR-CIPHET, Ludhiana.
- Vigilance awareness week was celebrated in ICAR-CIPHET during 28 October to 2 November 2019.



- ICAR-CIPHET, Ludhiana celebrated its 31st Foundation Day on 03 October, 2019.



- All staff of ICAR-CIPHET celebrated Communal Harmony Campaign Week from November 19-25, 2019 at ICAR-CIPHET
- The Flag Day of India is a day dedicated to India towards collection of funds from people of India for the welfare of the Indian Armed Forces personnel, which was organized at ICAR-CIPHET, Ludhiana on 25 November 2019.
- All staff of ICAR-CIPHET celebrated Constitution Day on 26 November 2019



- 28 staffs of ICAR-CIPHET participated in ICAR North Zone Sports Meet held at ICAR-IIPR, Kanpur during 12-14 December 2019.
- The Swachhta Hi Sewa was celebrated from 11 September to 2 October. The theme was ‘SINGLE USE PLASTIC’. Activities were performed ICAR-CIPHET, Ludhiana and Abohar regularly. Shramadhan was scheduled daily at regular time and all the staffs performed their activities regularly. All the staff of ICAR-CIPHET participated in “Swachhta Hi Sewa” mission and campus/premises cleanliness activities.



EXTENSION ACTIVITIES

- ICAR-CIPHET Ludhiana demonstrated institutional technologies during foundation-

laying ceremony for ICAR-IIMR building at Ladowal, Punjab on 15 November 2019.



addition and waste utilization of horticultural crops for augmenting farmers income’ was organized during 01-21 October, 2019.



WINTER SCHOOL

- ICAR-sponsored 21 days winter school on “Design, Innovations and Applications of Plastics Technology in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling the Farmer’s Income” was organized at ICAR-CIPHET, Ludhiana during 05 –25 November 2019.

- ICAR-CIPHET participated and demonstrated post-harvest and value addition technologies in the Food and Crafts *Mela* 2019 organized at Punjab Agricultural University on 20 October 2019



MODEL TRAINING COURSE

- Model Training Course on ‘Novel processing technologies for enhancement of income in production catchment, sponsored by Directorate of Extension, MoA&FW, Govt. of India was organized at ICAR-CIPHET during 26 November - 03 December 2019.



TRAININGS

SUMMER SCHOOL

- ICAR sponsored 21 days summer school entitled ‘Cutting edge epitome of processing, value

ENTREPRENEURSHIP DEVELOPMENT PROGRAMME

- Entrepreneurship Development program on “Beetroot processing and value addition” is organized under the CRP on SA Project on “Establishment of modern agro-processing centers for fruits and vegetables” during 16-18 October 2019 at ICAR-CIPHET, Ludhiana.
- Three days EDP training programme was organized at ICAR-CIPHET, Abohar on ‘Application of mulching technology for quality production of winter season vegetable crops’ from 9-11 October 2019

HUMAN RESOURCE DEVELOPMENT PROGRAMME

- HRD Training on “Food Packaging Technologies and its Future Research Prospects” was organized at ICAR-CIPHET Ludhiana during 06-19 December 2019

STUDENT’S TRAINING

- Student’s training was conducted for final year B. Tech students (10) from College of Agricultural Engineering and Technology, SKUAST-Kashmir, Srinagar (J&K) during 04

October to 03 November, 2019 at ICAR-CIPHET, Ludhiana

- In-Plant Training was organized for 14 B. Tech students from SKAUST, Jammu & Kashmir at ICAR-CIPHET, Abohar from 05 October to 05 November, 2019.

SC SUBPLAN

- ICAR-CIPHET organized a farmers training on ‘Post-harvest management of fish’ under SCSP at College of Fisheries, Assam Agriculture University, Raha, Assam during 15-17 October, 2019. Dr. Armann U. Muzaddadi and Er. Sandeep Dawange was the coordinators of the training.
- ICAR-CIPHET organized a training programme on “Post-Harvest Management of Maize” under SC Sub plan at Betul, Madhya Pradesh during 27-29 November, 2019
- ICAR-CIPHET organized a farmers training on ‘Post-Harvest Handling and Processing of Fresh Water Fish’ under SCSP at 2019 at College of Fisheries, Chhattisgarh Kamdhenu Vishwavidyalaya, Kawardha, Chhattisgarh during 26-28 December 2019.

FARMERS/STUDENTS/OFFICERS VISIT

*S: Students, O: Officers

| S.No. | Visitor Name and Address | No: of Visitors | Date of Visit |
|-------|--|------------------|------------------|
| 1 | Kelappaji College of Agricultural Engineering & Technology, Kerala Agriculture University, Tavanur, Kerala | 50 (S) + 3 (O) | 18 October 2019 |
| 2 | College of Agriculture, Navsari Agriculture University, Waghai, Gujarat | 50 (S) | 15 November 2019 |
| 3 | College of Horticulture, Kerala Agriculture University, Vellanikkara, Thrissur, Kerala | 57 (S) + 3 (O) | 15 November 2019 |
| 4 | College of Fisheries, Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana, Punjab | 12 (S) | 19 November 2019 |
| 5 | College of Agriculture, University of Agricultural Sciences (B) V.C. Farm, Mandya, Karnataka | 51 (S) | 25 November 2019 |
| 6 | College of Agriculture, Kerala Agriculture University, Vellayani, Thiruvananthapuram, Kerala | 98 (S) + 4 (O) | 30 November 2019 |
| 7 | University of Agricultural Sciences, Raichur, Karnataka | 107 (S) + 05 (O) | 09 December 2019 |



Visit 18 October 2019



Visit 30 November 2019



Visit 09 December 2019

PAPERS PUBLISHED/COMPENDIUM /POPULAR ARTICLES

Research Paper

- Meena VS, Bhardwaj R, Sharma RR, Mahawar MK, Sharma VK, Singh K (2019). Evaluation of ber genotypes for fruit yield and quality attributes. *Indian Journal of Horticulture*. 76 (3): 527-529.
- S. K. Tyagi, V. R. Bhagwat, P. N. Guru, Aarti Nimesh and Anju B. Khatkar, 2019. Effect of botanical smokes generated using developed

indigenous furnace on pulse beetle. *Journal of Entomology and Zoology Studies* 2019; 7(5): 441-444.

Book chapter:

- Singh AP and Kumar S (2019). Application of tannins in industry. In: *Tannins- Structural properties, Biological Properties and Current Knowledge*, In Tech Open Publishers, London, UK. DOI: <http://dx.doi.org/10.5772/intechopen.85984>. Pp. 1-19.
- Ajinath Dukare, Umesh Kamble and Ramanna Koulagi (2019). Biological Management of Agricultural Crops Diseases using Microbial Biocontrol Agents. *Biotechnology in Plant Protection and Crop Improvement* (ISBN: 978-93-88854-23-8). Pp 54-67.
- Kumar Y, Mehta N, Anurag R K, Sethi S, Bashir A A, Kumar V and Narsaiah K (2019). Improving Meat Safety through Reformulation Strategies: Natural Antioxidants and Antimicrobials. In *Reformulation as a Strategy for Developing Healthier Food Products*. Springer, Cham. Pp. 251-289.

Training Manual:

- Ghodki B M, Sakharam I N, Singh R K, Muzaddadi A U, Meena P K and Meena A (2019). Training Manual on Post-Harvest Management of Maize, SCSP of ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana. pp 1- 133
- Muzaddadi A U, Dawange S P, Kakati B K and Baishya S (2019). Training Manual on Post-Harvest Management of Fish, SCSP of ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana. pp 1- 133
- Muzaddadi A U, Kumar V and Jakhar J K (2019). Training Manual on Post-Harvest Handling and Processing of Fresh Water Fish, SCSP of ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana. pp 1- 124

Compendium:

- Sunil Kumar, Ramesh Kumar and Sandeep Mann (2019). Compendium of ICAR sponsored Summer School on Cutting edge epitome of processing, value addition and waste utilization of horticultural crops for augmenting farmers income at ICAR-CIPHET, Ludhiana during 01-21 October 2019
- Sandeep Mann, Surya Tushir and Sandeep Dawange (2019). Compendium of Model Training Course on 'Novel processing technologies for enhancement of income in production catchment, sponsored by Directorate of Extension, MoA&FW, Govt. of India, held during 26 November - 03 December 2019
R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School Design, Innovation and Applications of Plasticulture Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019.

Conference Paper/Abstract

- Swati Sethi, D N Yadav and Sneha Snigdha. (2019). Process Optimization for Extraction of Protein Isolates from Grass Pea (*Khesari* Dhal). In compendium of National Conference on "Innovations in Bioprocess Technology" held during 11-13 December, 2019 at NABI and CIAB campus, Mohali
- Kalnar, Y. B., Mann S., Devi, B. T. and Ghodki, B. M (2019). Design and development of real time, low cost automatic data logger. In compendium of 8th Asian-Australasian Conference on Precision Agriculture (ACPA 2019) held during 14-17 October, 2019 at Punjab Agricultural University, Ludhiana.
- T B Devi, Y B Kalnar and K Narasiah (2019). Design Consideration of sensor based smart solar dryer for precision drying. In compendium of 8th Asian-Australasian Conference on Precision Agriculture (ACPA 2019) held during

14-17 October, 2019 at Punjab Agricultural University, Ludhiana.

- Kumar S, Kumar R and Singh RK (2019). Utilization and valorization of horticultural byproducts: Waste to wealth approach. In compendium of National seminar on "Secondary agriculture: Significance and scope in the era of globalization" held during 27-29 November, 2019 at Navsari Agricultural University, Navsari, Gujarat. Pp. 75-83.
- Mridula D., R.K. Singh and Deepika Goswami (2019). Processing and Value Addition of Nutri-Cereals (Millets). In Souvenir of National Workshop on Nutri-cereals (Millets) held at Krushi Bhawan Odisha, Bhubaneswar, Odisha during 16 October 2019. Pp 116-128.

Popular /Technical/Compendium Articles

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- Mridula D., Deepika Goswami, Sonmati, Sandeep Kaur and Guru P.N (2019). Adoption of extrusion technology for entrepreneurship in rural areas. In compendium of Model Training Course on 'Novel processing technologies for enhancement of income in production catchment, sponsored by Directorate of Extension, MoA&FW, Govt. of India, held during 26 November - 03 December 2019. pp 33-46.
- Guru P. N (2019). Grain storage pests and their management: relevance with farmers' income. In compendium of Model Training Course on 'Novel processing technologies for enhancement of income in production catchment, sponsored by Directorate of Extension, MoA&FW, Govt. of India, held during 26 November - 03 December 2019. Pp 145-158.
- Surya Tushir, D. N. Yadav, Rajeev K. Kapoor and Manju Bala (2019). Technological intervention for utilization of rice bran as a Protein source. In compendium of Model

Training Course on 'Novel processing technologies for enhancement of income in production catchment, sponsored by Directorate of Extension, MoA&FW, Govt. of India, held during 26 November - 03 December 2019. Pp 47-52.

- Rajeev K. Kapoor*, Surya Tushir and D. N. Yadav (2019) Production of Enzymes from Agro residues and Food Industry Waste Using Microorganisms. In compendium of Model Training Course on 'Novel processing technologies for enhancement of income in production catchment, sponsored by Directorate of Extension, MoA&FW, Govt. of India, held during 26 November - 03 December 2019. Pp 85-89.
- Ghodki, B. M., Kalnar, Y. B., Devi, B. T., and Sakharam I. N. (2019). Role of microcontrollers and sensors in plasticulture and post-harvest management of horticulture produce. In Singh R. K., Singh R., and Sakharam I. N. (Eds), Design, Innovations and Applications of Plasticulture Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling the Farmer's Income , Pp. 117-123. (Nov 05-25, 2019). Ludhiana: ICAR-CIPHET
- Devi, B. T., Kalnar, Y. B., Ghodki, B. M., and Sakharam I. N. (2019). Drying of agricultural produce using renewable energy for better post-harvest quality. In (Eds) R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School 'Design, Innovation and Applications of Plasticulture Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019. Pp. 25-33.
- Kalnar, Y. B., Ghodki, B. M., Devi, B. T., Dawange S., and Sakharam I. N. (2019). Application of sensors and machine vision in control environment agriculture and post-harvest technology. In (Eds) R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School 'Design, Innovation and Applications of Plasticulture Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019. Pp. 71-75.
- Mridula D. Processing of food grains for food security and income generation. In (Eds) R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School 'Design, Innovation and Applications of Plasticulture Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019. Pp 125-138.
- Goswami S., Mridula D., Harshad M. Mandge and Rajpreet Kaur Goraya. Regulatory framework for use of plastics as food packaging. In (Eds) R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School 'Design, Innovation and Applications of Plasticulture Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019. Pp. 35-46.
- Manju Bala, Surya Tushir and Poonam Choudhary. Food adulteration with special reference to vegetables. In (Eds) R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School 'Design, Innovation and Applications of Plasticulture Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019. Pp 139-142.
- Guru P. N. and Indore Navnath S. Protected Cultivation: View of Pest Management. In (Eds)

R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School 'Design, Innovation and Applications of Plastics Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019. Pp 77-79.

- Kumar S, Kumar R, Nath P and Soni R (2019). Plastics: Basic chemistry, properties and standards. In (Eds) R K Singh, Ranjeet Singh and Navnath Indore (2019). Compendium of ICAR sponsored Winter School 'Design, Innovation and Applications of Plastics Technologies in Agriculture, Horticulture and Pisciculture Production and Post-Harvest Management for Doubling Farmer's Income at ICAR-CIPHET, Ludhiana during 5-25 November 2019. Pp. 91-94.
- Vikas Kumar and Armaan U Muzadaddi (2019). Packaging of Fish and Fishery Products. In: Eds: A.U. Muzadaddi, S.P. Dawange, B.K. Kakati and S. Baishya. Training Manual on Post-Harvest Management of Fish.

E-publication

- Krishna, Jalgaonkar K, Bibwe B, Manoj Mahawar (2019). Wax Apple: Cultivation, post-harvest processing and value addition, Agriculture & Food: e-Newsletter, Volume 1 (8): 60-65.
- Devi, B. T., Jyoti B., Bijarniya H., Kalnar, Y. B., and Ghodki, B. M. Refractance window drying: a novel drying technology. Agriculture and Food: E-Newsletter, 1(11): 292-296. (ISSN: 2581-8317; Nov 2019).

E-poster

- Ghodki, B. M., Chhetri K. B., Goswami T. K., (2019). Discrete element modeling of black pepper flow in cryogenic precooler. Presented in 8th Asian-Australasian Conference on Precision Agriculture (ACPA 2019) held during 14-17

October, 2019 at Punjab Agricultural University, Ludhiana.

- Narsaiah K., Bedi V., Ghodki, B. M., and Kalnar, Y. B. Heat transfer modeling of fluid during spray chilling of palm oil (2019). Presented in 8th Asian-Australasian Conference on Precision Agriculture (ACPA 2019) held during 14-17 October, 2019 at Punjab Agricultural University, Ludhiana.

Invited Lectures

- Dr. Sunil Kumar delivered invited lead lecture on Utilization and valorization of horticultural byproducts: Waste to wealth approach in National seminar on Secondary agriculture: Significance and scope in the era of globalization organized at Navsari Agricultural University, Navsari, Gujarat during 27-29 November, 2019
- Dr. Manju Bala delivered invited talk on "Infrared spectroscopy: Nondestructive analytical technique" in National conference on "Advances In Biotechnological Researches In Plants, Animals And Microorganisms During Last 10 Years" organized at M.N. College and Research Institute, Bikaner (Affiliated to Maharaja Ganga Singh University, Bikaner and Recognized by Govt. of Rajasthan) during 14-15 December 2019.

Dr. Guru P N delivered a lecture on 'Insecticide usage and Farmers' perceptions about insecticides' in 'International Conference on Environmental Ethics, Resource Management and Regional Development: Issues, Challenges and Prospects' held at Dr. Bhim Rao Ambedkar Government College, Sri Ganganagar, Rajasthan during 29-30 November 2019.

Conference/ Workshop/ Meeting/ Training Attended

- Dr. R K Singh, I/c Director & PC PET, Er. Indore Navanth S, Dr. Th. Bidyalakshmi, Dr. B.M. Ghodki and Er. Yogesh Kalnar, Scientist participated in 8th Asian-Australasian

Conference on Precision Agriculture at Punjab Agricultural University, Ludhiana from 14-17 October 2019.

- Dr. Sunil Kumar (Principal Scientist) and Sh. Prithviraj (ACTO) attended QRT meeting of KVKs of Punjab and submitted QRT report at ICAR-ATARI, Ludhiana on 10 October 2019
- Dr. Swati Sethi attended three days conference on Innovations in Bioprocess Technology held during 11-13 December 2019 at NABI and CIAB campus, Mohali
- Dr. Guru P N presented a project proposal entitled 'Non-chemical management of stored-grain moths using flexible light-trap' in Expert Committee Meeting of DST-SYST (File No. SP/YO/2019/1019) at IIT, New Delhi on 02 December 2019.
- Dr. Sakharam Kale participated in XVth annual workshop of AICRP on PET held from 05-06 November 2019 at ICAR-CIFA Bhubaneswar
- Dr. Mridula D attended a, two days training programme on "Training workshop for Vigilance Officers of ICAR Institutes" organized during 31 October 2019 to 01 November 2019 at ICAR-NAARM, Hyderabad
- Dr. D. N. Yadav and Dr. Guru P. N. attended 'Workshop on preparation of EFC/PIB' at ISTM, New Delhi during 31 October 2019 to 01 November 2019
- Dr. Renu Balakrishnan attended the training programme on "Innovation Practices in Extension research and Evaluation" during 5-8 November, 2019 at ICAR-NAARM, Hyderabad
- Dr. Sandeep Mann attended Management Development Programme on Leadership Development (a pre-RMP Programme) from 02-13 December at ICAR-NAARM, Hyderabad
- Sh. B.C. Katoch, AAO attended training for improving Skills of Administrative Staff of ICAR dealing with Court cases during 25-27 November, 2019 at ICAR-Central Arid Zone Research Institute, Jodhpur, Rajasthan.

AWARDS AND RECOGNITIONS

- Dr. Guru P N awarded with 'Gold Medal' for Ph.D. (Agricultural Entomology) in 34th Convocation of Mahatma Phule Krishi Vidyapeeth, Rahuri (M.S) on 05.12.2019

KVK ACTIVITIES

TRAINING CONDUCTED

- One day training programme was organized on Soil Health Management for Sustainable Production and World Soil Health Day on 05 December 2019 at KVK, ICAR-CIPHET, Abohar. 14 farmers participated in the programme.
- An EDP on "Processing of Fruits and doubling income of farmers" for Anganwadi workers was conducted by KVK, ICAR-CIPHET on 29-31 October 2019. In this training program 25 anganwadi workers were participated.
- One day farmers training on Management of flower and fruits drop in Kinnow were conducted by KVK, ICAR-CIPHET on 23 October 2019. In this training program 50 farmers from surrounding villages participated.
- One day Farmers Training on Demonstration on Drip irrigation was conducted by KVK, ICAR-CIPHET on 07 November 2019. In this training program 50 farmers participated.

CRM Activities

- Two block level awareness programme on in-situ crop residue management was organized at Kahnewal, Jalalabad on 19 November 2019 and Behak Khas, Fazilka on 21 November 2019 by KVK, ICAR-CIPHET, Abohar.
- One College level programme on in-situ crop residue management was organized at DAV College Abohar on 14 November 2019 by KVK, ICAR-CIPHET, Abohar.
- One day IN-SITU Crop Residue Management Awareness camp at Government Senior Secondary School, Gobindgarh was conducted

by Krishi Vigyan Kendra, ICAR-CIPHET on 05 October 2019. Dr. Ramesh Kumar Head HCP & I/C KVK, Dr. Ajinath Dukare Dr. Vinod Saharan CTO had taken part in his programme.

- One day IN-SITU Crop Residue Management Awareness camp at Government Senior Secondary School, Balluana was conducted by Krishi Vigyan Kendra, ICAR-CIPHET on 10 October 2019. Dr. Ramesh Kumar Head HCP & I/C KVK, Dr. Ajinath Dukare had taken part in his programme.
- One day IN-SITU Crop Residue Management Awareness camp at village Buraj Muhar was conducted by Krishi Vigyan Kendra, ICAR-CIPHET on 15 October 2019. Dr. Ramesh Kumar Head HCP & I/C KVK, Dr. Vinod Saharan CTO and Sh. Prithviraj ACTO had taken part in his programme.

SECTORIAL NEWS

APEDA project India as organic food, commodity hub at Biofach India: Biofach India 2019, the country's leading trade fair for organic food was held in NCR New Delhi from 7-9 November, 2019. It was organized by Nurnberg Messe India and APEDA to showcase the country's strength as major hub for organic food products, ingredients, commodities and processed foods. It was the largest event for the organic agriculture and organic food sector of India, and witnessed the presence of the entire organic agriculture and food fraternity from across the country. Over 6,000 delegates, comprising exporters, processors, retail chain industry, certification bodies and producers from India and abroad participated in the trade fair-cum-exhibition to discuss and have firsthand feel of the Indian organic products, including tea, spices, honey, basmati rice, coffee, cereals, dry fruits, vegetables, processed foods and medicinal plants.

FSSAI directs fruit traders to avoid stickers to prevent contamination: The country's apex food regulator said that the safety of the adhesive used for pasting such stickers was unknown, and therefore, it was advised to avoid use of stickers. FSSAI explained that the stickers in Indian context were only used to either hide any decay or the brand name, which is contrary to the stickers' use in the developed world, wherein they consisted of information about traceability, grades, prices, etc. The advisory note issued by FSSAI said, "The adhesive may contain harmful chemicals which may affect human health, as the skin of fruits and vegetables are porous and the residue can percolate inside. The health risk of consuming these adhesives is high in case of fruits and vegetable consumed with skin." It advised the traders; therefore, the traders should discourage the use of stickers directly on fruits which do not provide any relevant information.

Shahi litchi fourth Bihari product to get Geographical Indication (GI) tag: Shahi litchi, grown in the districts of Muzaffarpur, Vaishali, Samastipur, Champaran and Begusarai and adjoining areas of Bihar, was given the GI tag. It has become the fourth product from the state to receive the status, the others being Jardalu mango, Katarni rice and Magahi paan. Shahi is one of the choicest varieties of litchi in the state. This variant of the fruit is sweet, juicy and has a pearly white aril and is known for its attractive appearance and delicious flavour. The registration was done in the name of the Muzaffarpur-based Litchi Growers' Association of Bihar, which had applied for the tag. The state produces 40 per cent of the litchis grown in India in 38 per cent of the area.

Konkan region Alphonso mango gets GI tag: Alphonso, majorly produced in southern Maharashtra's Konkan region, has won the GI tag. With this, Alphonso from Ratnagiri, Sindhudurg, Palghar, Thane and Raigad districts of Maharashtra, can now claim the place of

origin of this mango type - Konkan. GIs have been defined under Article 22(1) of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement as: "Indications which identify a good as originating in the territory of a member, or a region or a locality in that territory, where a

given quality, reputation or characteristic of the good is essentially attributable to its geographic origin. The king of mangoes, Alphonso, better known as 'Hapus' in Maharashtra, is in demand in domestic and international markets and has long been one of the world's most popular mango.

About the publication:

ICAR-CIPHET News is an in-house quarterly publication of ICAR-Central Institute of Post-Harvest Engineering and Technology aimed at brief compilation and highlighting of the activities/ information associated with different research, extension and HRD activities taken up by the scientists of the institute, AICRP (PHET), AICRP (PET) and KVK (ICAR-CIPHET), Abohar and also the information regarding other important activities of the institute.

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