



**CIAE**

**NEWSLETTER**

Vol. 28 No. 1  
January-March 2018

Modernizing agriculture through engineering interventions



www.ciae.nic.in

**From the Director's Desk**



India has morphed into a self-sustained country as far as food grain, fruits and vegetable and milk production are concerned. The growth in agricultural production scenario has witnessed Green, White and Blue revolution. However, with the shrinking land and water resources and labour force, the onus has been on mechanization of production and post production of agricultural commodities for sustainable growth in the agricultural sector to feed the ever burgeoning population, while utilizing the natural resources judiciously.

Today, Government of India is emphasizing on the "Doubling farmers' income" to make agriculture sector a profitable and lucrative business, while giving due importance to "Make in India", to promote mechanization and automation for income and employment generation. ICAR-CIAE has been working tirelessly in this area for the cause of farmers since its inception.

ICAR- CIAE has been making efforts to develop technology in the area of farm mechanization, energy in agriculture, irrigation and drainage and post-harvest technology. Considering the demand for large size potato by the potato processing industries, a breakthrough technology has been developed in producing 'Jumbo potato' through judicious use of water through drip irrigation and plastic mulching at Institute farm. At the same time, we have bumper production of fruits and vegetables, which have good export potential and need specific standards to be maintained. A pilot scale automated pack line has been

developed for sorting and packing spherical fruits based on colour and weight. This is another breakthrough achievement of CIAE in the area of automation. During this quarter, a good number of need based machinery such as tractor operated variable width raised bed former, tractor operated three-row automatic vegetable transplanter for potted seedlings, self-propelled site-specific fertilizer applicator, tractor operated cassava stake cutter planter, tractor operated multi-crop planter, etc has been developed and evaluated. CIAE has now established itself a niche in the area of automation of agricultural production and post production operations.

During the period, important events like Republic day, Institute's 43rd Foundation Day have been celebrated; Farmer's Fair, Nutri-Mela, trainings and workshops including a Winter School and two CAFT trainings have also been organized. Our scientists won several awards for their research achievements and added to the glory of our Institute for which I heartily congratulate them. I also take this opportunity to wish the best of luck to our superannuated staff.

It is my proud privilege to present this volume of the CIAE Newsletter.

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## RESEARCH & DEVELOPMENT

### Tractor operated variable width raised bed former

A tractor operated variable width raised bed former for vertisol has been developed and tested at ICAR-CIAE, Bhopal. Overall dimensions of variable width raised bed former are 1000×2000×1000 mm and it weighs 3000 N. It consists of main frame, bed shaper and two adjustable side wings, which collects the soil in shaper and makes compact raised bed of widths 600, 800 and 1000 mm with 15 cm height. The field capacity and field efficiency of machine are 0.54 ha/h and 85%, respectively at a forward speed of 3.6 km/h with maximum horizontal draft of 4000 N and vertical force of 1000 N.



### Tractor drawn three-row automatic vegetable transplanter for potted seedlings

A tractor drawn three row automatic vegetable transplanter for potted seedlings has been developed to transplant seedlings of tomato and chilli crop grown in cylindrical paper pots of 90 cc (pot diameter 54 mm). The transplanter consists of a main frame, seedling metering units (inclined cut cup magazine), furrow openers (reversible shovel type), soil covering device



(disc type), seedling tray shifter, seedling trays, ground wheels and chain and sprocket type power transmission system. The average field capacity, field efficiency, labour requirement and fuel consumption of transplanter are 0.11 ha/h, 56%, 18 man-h/ha, and 3.5 l/ha, respectively; whereas, transplanting efficiency and overall efficiency are 92% and 85%, respectively, for tomato and chilli seedlings at the forward speed of 1.2 km/h.

### Self-propelled site-specific fertilizer applicator

The self-propelled site-specific fertilizer applicator performs top dressing operation of urea in widely spaced field crops. It consists of main frame, 3.6 kW petrol start kerosene run engine, two fertilizer boxes (8 kg capacity each), fluted roller metering mechanism, triggering mechanism to detect plant and actuate fertilizer delivery to target plant and sweeps for weeding operation. As it performs urea top dressing and weeding simultaneously, it has a good potential of reducing the cost of cultivation of cotton crop. Application rate of urea can be simply varied by changing exposed length of fluted roller to suit the requirement. The developed prototype is suitable for site specific delivery of fertilizer to maize plants spaced at 90 x 60 cm plant when operated at a forward speed of 1.5 km/h. Moreover, the machine can be used in widely spaced crops like cotton, pigeon pea, maize and sugarcane etc. for application of granular fertilizer.



## RESEARCH & DEVELOPMENT

### Tractor operated cassava stake cutter planter

A tractor operated single row cassava stake cutter- planter has been developed by CIAE Regional centre, Coimbatore. It has a main frame, stake cutting system, stake planting mechanism, transmission system and ridger. The cutting system consists of two counter rotating shafts with two numbers of blades each placed at equal distance. The stake planting mechanism consists of a set of counter rotating rubber wheels. Both the stake cutting and stake planting mechanisms get transmission from the tractor PTO with suitable power transmission system. The equipment when in operation attached to a 35-40 hp tractor forms a single ridge with the cassava stem cut into stakes of 24 cm length and planted on top of the ridge vertically at a metered distance of 45 cm. The actual field capacity of the planter is 0.18 ha/h. The cost of operation of cassava planter is Rs.3125/ha and it saves 60% in cost compared to manual planting. The cost benefit ratio and payback period of developed planter worked out to be 2.06 and 4.31 year respectively. The cost of the unit is about Rs.90,000/-.



### Tractor operated multi-crop planter for sowing on beds

The tractor operated multi-crop planter performs sowing on beds (AICRP on FIM - Hisar Centre). It consists of a trapezoidal hopper, 12 furrow openers, 4 ridgers, notched inclined plate type seed metering mechanism, lugged ground wheel for transmitting power and one bed shaper that weighs 425 kg. The planter has been evaluated

for sowing of pea, coriander, mustard, gram, and carrot seeds of different varieties in the field. The seed rate can be controlled by varying the angle of inclined seed plate. The average width of sowing varies from 2.10 to 2.13 m in all five crops. The field capacity of planter varies from 0.29 to 0.31 ha/h. The field efficiency of planter has been observed as 78.6% in pea, 79.2% in coriander, 80.8% in mustard, 81.5% in gram and 81.1% in carrot.



### Air brake system for agricultural tractor-trailer

Air pressure brake system has certain distinct advantages, especially over a hydraulic pressure brake system in agricultural tractor-trailers, used to carry heavy loads in the range of 20-40 tonnes. Since, the supply of air is unlimited, the brake system can never run out of its operating fluid, as is the case of hydraulic brakes. In the former case, minor leaks do not result in brake failures, thus providing better safety features and have better efficiency. Considering above points, a tractor-trailer air pressure brake system has been developed by PAU Ludhiana Centre of AICRP on ESA. The system mainly consists of air compressor, air reservoir, pressure regulator, brake pedal for trailer, dial gauge, connectors, boosters, rotating adjusters, cam system and expanding type leather brakes. The tractor-



## RESEARCH & DEVELOPMENT

trailer combination was tested at tar-macadam road for stopping distance in different gears and engine speeds. The average stopping distance after application of sudden brake has been observed to be 1.0-3.5 m in the engine speed range of 1000-2800 rpm in 2<sup>nd</sup> High and 4<sup>th</sup> High Gear.

### Portable briquetting machine for paddy straw

Burning of paddy straw has become a national problem as it adversely affects the air quality and general well being of a large section of population. Briquetting can be one of the options for management of unused paddy straw; however briquetting of paddy straw is a difficult task, owing to the high silica content that does not have a good binding property. A portable briquetting machine of 50-60 kg/h capacity for paddy straw has been developed. The process protocol for production of briquette from paddy straw includes grinding of paddy straw (< 5 mm), mixing with other crop residues at varied ratio from 50-70 with cow dung (20% of total biomass), finally conditioning with water for 24-48 h, while maintaining the moisture content of feedstock in the range of 50-60 per cent. The machine is operated at 350 rpm with a power source of 10 hp electric motor with manual feeding. The density and calorific value of briquettes have been observed to be in the range of 520-550 kg/m<sup>3</sup> and 3600 kcal/kg, respectively, while that of the raw material are 80-120 kg/m<sup>3</sup> and 3200 kcal/kg, respectively. The briquettes have excellent shattering resistance and durability, with a production cost of about Rs.4.8/kg.



temperature, growth and yield parameters of potato under drip irrigation. The potatoes (cv. Kufri Badshah) with optimum seed size (35-40 g) are sown at a spacing of 60 x 30 cm on a raised bed having 90 cm width and 15 cm height with black and silver colour plastic mulch (0.03 mm thick). Drip irrigation has been provided on alternate days with emitters spaced at 0.3 m having 2 lps discharge rate. All the growth parameters such as plant height, no of stems, no of flowers, stem girth (mm), SPAD values and water use efficiency have been found higher under the black mulch followed by silver mulch as compared to no mulch conditions. In terms of yield, the treatment of black mulch film removed on 60th day after sowing gave maximum yield (38.1 t/ha). Apart from higher yield, the size of the tubers harvested from the treatment black mulch film removed on 60th day have been found three to four times bigger as compared to open field cultivation. The tubers weighing as high as above 900 g have also been observed with average weight of 780 g for this treatment. With an additional investment of Rs 25,000/ha for mulching under drip irrigation, the farmers can get an additional marketable yield of 40-45%.



### Effect of plastic mulch film and its colour on potato crop production

Experimental trials have been conducted during the last three years to study the effect of plastic mulching duration and mulch colour on soil

## RESEARCH & DEVELOPMENT/ TRAINING

### Automated packing line for spherical horticultural produce

Automated packing line for spherical horticultural produce has been developed which can carry out real time sorting of spherical horticultural crops on the basis of three weight categories and colour. The packing line is attached with a water jet washer and perforated cylindrical LDPE heat sealing packing unit. The overall capacity of the machine is about 200 kg/h (assuming average fruit weight to be 120 g). The colour and weight based real time sorting efficiency of the machine is 92 and 88%, respectively. Colour and weight based sorting algorithms are individually programmable to accommodate variety of spherical fruits like oranges, sweet lime, apple etc



Fruit Singulation and Washing Tank



Colour and weight sorting assembly



Automated fruit packing line

### Protein rich soy fortified compressed food bars for undernourished children

A protein rich formulation for composite cereal bar has been developed based on soy, wheat, rice, sesame and mung bean. The soy composite cereal bar includes cocoa powder, coconut milk, skimmed milk powder, butter and sugar having protein and fat content 18-19% and 24 - 25%, respectively. Compressed protein bar with acceptable sensory quality, peroxide value (less than %), FFA content (value less than 2.5% ), has a shelf life of 3 months, when packed in polypropylene (PP) and 4-5 months in metallized packing (MP) under ambient temperature as well storage at 37°C.



### Training Organized

#### ICAR sponsored Winter School

ICAR sponsored Winter School on Start-up Opportunities Based on Agricultural Engineering Technologies was organized during 1-21 February, 2018. Fourteen participants (researchers, academicians and subject matter specialists) participated. The trainees were exposed to technologies and start-up opportunities related to farm mechanization, agro-processing and value addition, manage-



## TRAINING

ment and inter-personal skills as well as management of intellectual rights and properties from a galaxy of master trainers, management experts and subject matter specialists both in-house and invited experts.

The programme also offered plenty of hands-on practical sessions on agricultural engineering technologies and live demonstrations for confidence building and visit to various industries and market places for witnessing the functioning of start-up ventures. Dr. UR Badegaonkar was the Course Director and Dr. KP Saha was the Course Co-Director of this Winter School.

### ICAR sponsored CAFT trainings

During this quarter, two ICAR sponsored CAFT trainings were organized during 4-24 January, 2018 and 20 February to 12 March, 2018.

The first training on "Advanced storage and packaging technologies for durable and perishable foods", organized during 4-24 January, 2018, attended by 10 participants (scientists and faculty from State Agricultural Universities, ICAR institutes and KVKs of different states). The course was designed to bring about qualitative improvement and update the knowledge of the participants in the area of packaging and storage of foods. The participants were trained through lectures, practical, demonstrations and field visits. Visits were arranged to FCI godowns, CIPET Bhopal and industries for demonstration of processing and storage practices for food grains, manufacturing and testing of packaging materials. Dr. SK Giri and Er. Dilip Pawar were the Course Co- Directors.



The second training on "Improved nutritional outcomes through integrated approaches of processing" was organized during 20 February to



12 March, 2018. Ten participants from 10 states representing SAUs, ICAR Institutes and KVKs participated in the CAFT training. The importance of nutrition and also how processing technologies could be effectively used to enhance the value of food was covered in this course. Given the magnitude of malnutrition in the country it is very important to integrate the different approaches of processing to improve the nutritional status of the population. Dr. Dipika Agrahar Murugkar, National Fellow and Dr SK Chakraborty, Senior Scientist, APPD were the Course Co-Directors.

### Hands-on training for farmers on improved agricultural implements and machinery

Hands-on Training for Farmers on Improved Agricultural Implements and Machinery was organized in six batches 2-4 January, 2018; 23-25 January, 2018; 6-8 February, 2018; 15-17 February, 2018; 20-22 February, 2018; and 12-14 March, 2018. About 440 farmers from ten states (202 from Madhya Pradesh, 103 from Gujrat, 40 from Maharashtra, 29 from Andhra Pradesh, 23 from Jharkhand, 22 from Bihar, 17 from Utter Pradesh, 2 from West Bengal, 1 each from Kerala and Odisha) participated in these trainings. During the training, participants were briefed on updates of technologies on farm mechanization and agro-processing. They were



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given hands-on training including demonstrations of improved agricultural technologies, necessary adjustments as well as visits to different laboratories to get exposure to different available agricultural technologies. Demonstration of operation-wise implements required for seed bed preparation, sowing/ planting and transplanting, spraying, interculture as well as harvesting and threshing were given. Women-friendly tools/ implements, conservation agriculture machinery, and bullock drawn machinery were also demonstrated. Covered cultivation techniques for crop production were also demonstrated.

### Training on custom hiring of agricultural machinery

Entrepreneurship development training on custom hiring of agricultural machinery was organized in two batches during 5-10 February, 2018 and 4-9 March, 2018. Total 73 participants attended the training.



### Skill Development Programmes

During this quarter, three skill development training programmes as per the guidelines of Agricultural Skill Council of India, NSDC were organized.

The first skill development programme on 'Green House Operator' was organized in two batches during 15 January to 13 February, 2018 and 6 February to 9 March, 2018. 52 rural youth from Bhopal and neighbouring districts participated. The participants were provided with class room lectures followed by practical classes on various operations involved in green house cultivation and management of crop canopy under greenhouse conditions. They were also taught about occupational health issues, basics of computers, precautions to be taken up while



connecting electrical systems etc. Three exposure visits were organized by taking them to greenhouse manufacturing industry, drip lateral manufacturing industry and to farmers field where the green house cultivation is being practiced.

The second skill development programme on 'Tractor Operator' was organized during 27 February to 24 March, 2018, attended by 20 participants. The skill development programme was targeted to impart skill of operation and maintenance of tractor and field operation of primary tillage, secondary tillage, sowing and planting, interculture and plant protection, harvesting and threshing machinery and tractor trailer. The participants themselves practically carried out all the field operations using tractor and farm machinery facility available at the Institute. Exposure visits were also conducted during 200 h training programme, spread over 25 days.



The third skill development programme on 'Harvesting Machine Operator' was organized during 27 February to 24 March, 2018. The training was attended by 20 farmers of Bhopal, Devas and Vidisha districts. The training programme consisted of lectures, laboratory visits and field demonstration, hands-on practical

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training as well as group discussions on combine harvester. Educational trips were also organized for the trainees at CFMTTI, Budni; Eicher Tractors Plant, Mandideep and Kaushal Vikas Kendra.



For certification of participants, assessment of participants was conducted through agency designated by Agricultural Skill Council of India (ASCI).

### Exposure visit by tribal farmers

Tribal farmers from Khalwa Block of Khandwa district visited on 21 February, 2018 to get awareness of the various agricultural technologies with special focus on "Millet Processing". The visit was sponsored by SABAL, an NGO of Caritas India working with these tribal farmers. During the visit, the farmers were given an overview of the various agricultural tools relevant agricultural practices. Demonstration of millet processing using the CIAE Millet Mill and with hands-on practice related to various settings and adjustments was imparted to the visitors. A short lecture on good agricultural practices and handling of millet with stress on its nutritional importance was also imparted to the visitors.



### Regional Centre, Coimbatore Activities

Training on 'EDP-Post Harvest Processing of Fruits and Vegetables' was organized on 5 January, 2018. Thirty women participants from Erode, Tirupur and Coimbatore districts of Tamil Nadu participated. The training imparted practical knowledge, exposure to various areas of fruits and vegetable processing through lectures on post harvest mechanization package for banana, vegetable processing and minimal processing of fruits and vegetables by scientists of CIAE RC, Coimbatore. A special lecture on Food Safety aspects was delivered by Mr. Murugesan, Food Safety Officer, Coimbatore Corporation. Demonstrations of various Post harvest technologies/ machineries viz. Package of equipment for minimal processing of banana central core, moringa leaf stripper, curry leaf stripper, multiplier onion peeler, Aloe vera gel extraction equipment and Aonla de-seeder, root vegetable washer etc., was conducted.



Training on 'Operation and Maintenance of Agricultural Machinery' was organized on 4 January, 2018 for farmers/ rural entrepreneurs at Agricultural Engineering College and Research Institute, Kumulur, Trichy district. About Forty farmers participated in this programme.



## TECHNOLOGY TRANSFER

NABARD officials visited the Centre to attend one day training on 23 January, 2018. Technologies of the centre were demonstrated to more than 25 high level officials from different parts of the country.

### Interaction Meet with Executives of Farmer Producer Group

The centre organized interaction meets with Executives of Farmer Producer Group at various districts to enlighten the group on various farm equipment suitable for the crops of different districts of Tamil Nadu, enabling them to procure quality equipment from reputed manufacturers under various government schemes.



### Interaction meet for doubling the farmers income

Interaction Meet on "Synergistic Agri. Engineering Technologies for Doubling the farmers Income 2022" in collaboration with ICAR-KVK, Erode, TNAU and line departments was organized at Kalani Farmer Producer Company Ltd, Erode District on 30 January, 2018. Scientists of the centre interacted with the participants. Technologies developed the centre such as cassava sett cutter planter, power



weeder, sugarcane bud chipper, etc. were demonstrated at farmers field near Kanakkam Palayam village, Gobi, Tamil Nadu.

### Demonstration of the technology to MoS (A)

Shri Parshottam Rupala, Hon'ble Union Minister of State for Agriculture & Farmers Welfare and Panchayati Raj visited ICAR-SBI, Coimbatore on 21 February, 2018 and sugarcane settling transplanter developed by the CIAE Regional Centre in collaboration with ICAR-SBI, Coimbatore was demonstrated to him during the visit.



### KVK Activities

KVK organized following training for farmers, benefitting 386 farmers:

- Advanced agricultural technology and mechanization to increase agricultural income (sponsored by ATMA, Betul)
- Vermicomposting & vermi culture (organized by NGO - Hum Hain Ek Santha at village Kalakhedi (Phanda))
- Advanced agril. technology for agricultural production and processing (Sponsored by ATMA Saharsa, Bihar)
- Advanced agricultural technology for soybean production and processing (organized by Development Foundation, New Delhi)
- Capacity building training programme on enhancing farm income through farm mechanization and custom hiring entrepreneurship (KVKs Officers participated, organized jointly by RVSKVV, Gwalior & KVK)
- Plant production (organized jointly by Hindustan Insecticide Ltd. and KVK)

## TECHNOLOGY TRANSFER

### On-farm testing

Sl. No.	Programme	No.	Area (ha)	No of villages
1.	Assessment of wheat (variety: MP -1203) under Irrigated Conditions	13	5.2	12
2.	Assessment of management of wilt in gram (wilt resistant variety - RVG-201) under rain fed condition	13	5.2	13
3.	Assessment of onion variety of NHRDF-Red-3	18	2.0	18



### Demonstration of farm machineries

Sl. No.	Programme	No.	Area (ha)	No. of Villages
1.	Assessment of Zero-Till Drill for Heavy Residue Conditions (For Wheat Sowing in Paddy Straw)	05	2.5	3
2.	Assessment of Inclined plate planter	05	2.5	1



### Visit of farmers

About 20 numbers of farmer's exposure visits to KVK were conducted wherein total 631 farmers visited from states of Madhya Pradesh, Rajasthan and Maharashtra. Farmers were exposed to improved tools and equipment used for mechanized cultivation of crop.

### MGMG programme

Sixteen groups (each comprising scientists of different disciplines) are conducting various technology demonstration programme under Mera Gaon Mera Gaurav programme of Government of India, covering 43 villages. During this quarter, 31 visits were made, 40 demonstrations conducted and 33 meetings with farmers were organized, benefitting 1346 farmers.



### Copyright registration granted

Software applications on Images of Plant Parts and Plant Varieties (Registration No. SW-9939/2018 dated 9 January, 2018).

### Signing of MoU

MoU has been signed with M/s MP Vigyan Sabha, Bhopal for creation of facility on Establishment of Solar Powered Village Lighting system at Gaidubba, Tamia Block, Madhya Pradesh.

### Technology and Machinery Demonstration Mela

Regional Centre of the Institute at Coimbatore organized Technology and Machinery Demonstration Mela in collaboration with TNAU and AICRP schemes on 9 February, 2018. More than 1000 farmers from different districts Tamil Nadu participated.



## TECHNOLOGY TRANSFER

### Participation in Exhibitions

Institute participated in the following exhibitions to display its technologies:

Exhibition	Duration	Place
Rashtriya Krishi Mela	25 January, 2018	IGKV, Rapiur
5th Assam International Agri-Horti show	5-8 January, 2018	Dibrugarh, Assam
First International Extension Congress	1-3 February, 2018	ICAR-CIWA, Bhubaneswar
Farmers Mela 2018	9-10 February, 2018	TNAU, Coimbatore
National Banana Festival 2018	17-21 February, 2018	Kalliyoorvillage, Thiruvananthapuram
Organic Expo 2018	7-9 March, 2018	Balaghat
Krishi Unnati Mela-2018	16-18 March, 2018	IARI, New Delhi



Centres of AICRP on ESA located at MPUAT, Udaipur; BSKKV, Dapoli; PAU, Ludhiana; CIAE, Bhopal; OUAT, Bhubaneswar; NERIST, Nirjuli; CSHPKV, Palampur; IIT, Kharagpur and IARI, New Delhi conducted Technology Demonstration Mela on 16 February, 2018. CAEPHT, Gangtok organized the Mela on 20 February, 2018. These centres showcased technology especially safety gadgets and gender friendly equipment to farmers. Some of the centres also retrofitted safety gadgets such as SMV emblem on tractor-

trailers of the farmers. About 3,223 farmers apart from various dignitaries participated in these programmes.



## TECHNOLOGY TRANSFER/ AWARDS

### Media Activities

	Topic	Date	Presenter
<b>Television</b>			
ETV (M.P.)	Advisory for the farmers on crops' protection from winter rains and hailstorm and contingency crop planning to reduce losses in yield and quality of crop produces	13 February, 2018	Shri RD Soni
DDK Bhopal	Live telecast programme on Zayad Ki Pramukh fasale evam Sam Samayik Krishi Karya	19 February, 2018	Shri RD Soni
DDK Bhopal	Live telecast programme on harvesting and threshing of rabi crops	1 March, 2018	Dr. UR Badegaonkar
<b>Radio</b>			
AIR, Bhopal	Importance of mechanization in agriculture	9 January, 2018	Dr. UR Badegaonkar
AIR, Bhopal	Jayad Phashalon Ki Unnat Kishme Evam Samayik Khrishikarya Irrigation and nutrient management in wheat crop	11 February, 2018	Shri RD Soni

### Awards

Scientist	Award	Awarded at
Dr. T. Senthilkumar Senior Scientist	ISAE Commendation Medal 2017	52 <sup>nd</sup> Annual Convention of ISAE held at AAU Anand during 8-10 January, 2018
Dr. Subir Chakraborty Senior Scientist	ISAE Distinguished Service Medal 2017	
Dr. AP Pandirwar Scientist	Young Scientist	33 <sup>rd</sup> M.P. Young Scientist Congress held at Rani Durgavati Vishwavidyalaya, Jabalpur during 15-16 March, 2018



Dr. T. Senthilkumar



Dr. Subir Chakraborty



Dr. AP Pandirwar

Dr. S. Mangaraj received Best Seller Book Award Certificate (2017) from JAIN BROTHERS for the book entitled "Modified Atmosphere Packaging of Fruits and Vegetables" authored by S. Mangaraj, by Jain Brothers, publisher & Book sellers, Delhi.

### Recognitions

Journal of Food Chemistry, Elsevier has recognized Dr. Debabandya Mohapatra as "Outstanding Reviewer" for the year 2017.

Dr. CR Mehta, Project Coordinator, AICRP on Farm Implements and Machinery has been

## AWARDS/ REPORT

### Awards for Best Research Papers

Scientist	Research Paper	Awarded in	Place & Duration
Er. Ramesh Kumar Sahni	Precision agriculture and farm mechanization	National conference on Digital and Engineering technologies for Precision Agriculture and Value Addition	CAE, ANGRAU, Bapatla, AP (26-27) February, 2018
Dr. AK Nayak Dr. KVR Rao Dr. CK Saxena Er Mukesh Kumar	Estimation of various loads of a naturally ventilated saw tooth type greenhouse		
Dr. Dawn CP Ambrose	Development of garlic peeler for domestic use	International conference on Emerging Synergies in Agriculture, Food process Engineering and Bio Technology	Karunya Institute of Technology and Sciences, Coimbatore (21-23 February, 2018)
Dr. RH Sadvatha	Development of fermentor for submerged fermentation of millets		

nominated as a member of Asian and Pacific Network for Testing of Agricultural Machinery (ANTAM) Technical Working Group (TWG) on Power Tillers for the second term (2018).

Dr. CR Mehta, Project Coordinator, AICRP on Farm Implements and Machinery has been elected as Vice President (Technical Council) of Indian Society of Agricultural Engineers for the term 2018-21.

### Ph.D. Awarded



Er. Bikram Jyoti has been awarded PhD degree in Farm Power and Equipment for his thesis titled "Design and Development of Electrostatic Sprayer" from Indian Agricultural Research Institute, New Delhi, India. He did his PhD under the guidance of Dr. Indramani Head, Division of Agricultural Engineering, IARI, New Delhi.



Er. Dilip Pawar was awarded PhD degree in Agricultural Process Engineering for his thesis titled "Standardization of Process Technology for Jaggery Granules and Cubes" by Mahatma Phule Krishi Vidyapeeth, Rahuri. He did his Ph.D. under the guidance of Dr. P. A. Unde, Ex. Professor & Head, Department of Agricultural Process Engineering, MPKV, Rahuri.

### Participation in ICAR-Inter Zonal Sports Meet

CIAE contingent (14 numbers) participated in the ICAR-Inter Zonal Sports Meet held at NAARM, Hyderabad during 21-25 February, 2018. CIAE stood winner in Volleyball Shooting, winning all the matches. The Institute bagged second position in Chess (Men).

### Research Papers

Delfy AL, Mohapatra D, Kotwaliwale N and Singh AK. 2018. Effect of microwave blanching and brine solution pretreatment on the quality of carrots dried in solar-biomass hybrid dryer. *Journal of Food Processing and Preservation*, 42(2), e13510.

Giri SK, Tripathi MK and Kotwaliwale N. 2018. Effect of composition and storage time on some physico-chemical and rheological properties of probiotic soy-cheese spread. *Journal of Food Science and Technology*, 55 (5):1667-1674.

Joyce OT, Chakraborty SK, Tripathi MK, Kotwaliwale N and Chandra P. 2018. Quality characteristics of sauerkraut fermented by using a Lactobacillus paracasei starter culture grown in tofu whey. *Food Science and Technology International*, 24(3):187-197.

Mangaraj S, Swain S, and Deshpande SS. 2018. Development of nutritious healthy noodles incorporating soy based functional food ingredients. *Journal of Food Science and Nutrition*, 4: 028.

Singh R and Giri SK. 2018. Active packaging techniques to reduce post-harvest loss in perishables with special reference to mango (cv. Dushari). *International Journal of Current Engineering and Technology*, 8 (2): 250-253.

## REPORT/ PUBLICATIONS

### Human Resource Development

Name and Designation	Course Title	Duration	Venue/ Place
Dr. Manoj Kumar Scientist	Statistical advances for agricultural data analysis	3-23 March, 2018	ICAR-IASRI, New Delhi
Er. AMWaghaye and Dr. Yogesh A. Rajwade Scientists	Agricultural system modelling to assess climate change impact in soils and crops	16-25 January, 2018	ICAR-IISS, Bhopal
Ajesh Kumar V Scientists	Improved nutritional outcomes through integrated approach of processing	20 February to 12 March, 2018	ICAR-CIAE, Bhopal
Shri RD Soni STO cum SMS	Enhancing from income through farm mechanization and custom hiring entrepreneurship	13-14 March, 2018	ICAR-CIAE, Bhopal
	Recent extension approaches for effective transfer of technology	19-21 March, 2018	KVK, Indore

### Books

Senthilkumar T. 2018. Operation and Maintenance of farm equipment (Tamil). Published by Thannambikkai Publication, Coimbatore ISBN no. 978-93-87314-40-5.

### Book chapters

Dawn CPA. 2018. Utilisation and Conservation of Ethno Medicinal Plants. In: Advances in Ethnobotany. Ed: Jha SK, Satish. Serial Publishing House, Delhi, India, ISBN No. 978-93-86200-27-3 Pp: 485-496.

Mehta CR, Dixit A, Manes GS. 2018. Mechanical management of paddy straw. In: Technology for Rice Production. Eds: Verma AK, Dave AK, Pandey VK, Pal Ashutosh. IGKV/Pub. Book/2018/02, Livolink Foundation, IGKV, Raipur, pp 18-25.

Naik R and Sudheer KP. 2018. Total value addition of Banana potential opportunities for entre-preneurs. In: Entrepreneurship and Skill Development in Horticultural Processing. Eds: Sudheer KP and Indira. V. Published by New India Publishing Agency, New Delhi. ISBN no 978-93-86546-80-7

Singh PL, Jena PC, Giri SK, Gholap BS and Kushwah OS. 2018. Solar-Powered Cold Storage System for Horticultural Crops. In: Energy and Environment: Select Proceedings of ICWEES-2016. Eds: Singh VP, Yadav S and Yadava RN. Springer Nature Singapore Pte Ltd., Singapore. ISBN 978-981-10-5797-7. Pp-125-133.

Sudheer KP, Naik R and Saranya S. 2018. In: Mechanization in Banana Processing. VAIGA 2017. Souvenir of Banana. Ed: Rugmini Devi. Published by Small Farmes Agri Business Consortium (SFAC), Kerala. Page 11-17

Tiwari RK. 2018. Prospects of rice mechanization in north-eastern region. In: Technology for Rice Production. Eds: Verma AK, Dave AK, Pandey VK and Pal A. IGKV/Pub. Book/2018/02, pp136-142.

### Technical Bulletin

Badegaonkar UR, Tamhankar MB, Saha KP and Bargale PC 2018. Start-up opportunities based on agricultural engineering technologies. Technical Bulletin No. CIAE/TTD/2018/484, pp 295.

Din M, Singh RC, More SN, Magar AP, Tiwari RK. 2018. Three decades of salient achievements of AICRP on Utilization of Animal Energy (1987-2017). Technical Bulletin No. CIAE/UAE/ 2018/243. pp 85.

Chandra Punit, Sinha LK and Singh RS. Impact of soy food training programme on enterprise development. Technical Bulletin No. CIAE/CESPU/ 2017/241

Magar AP, Thorat DS, Pandey HS, Praksh S and Dubey UC. 2018. Annual Progress Report 2017-18 of UAE-CIAE Bhopal Centre XVII Workshop of AICRP on UAE. Tech. Report No. CIAE/AMD/ UAE/2018/483

Pandey KC. 2018. Research highlights cum coordinator's report. Technical Report No. CIAE/EAAI/2018

Singh KK, Agrahar-Murugkar D, Chakraborty SK. 2018. Improved nutritional outcomes through integrated approaches of processing. Technical Bulletin No. CIAE/APPD/2018/248

Singh KK, Giri SK, Pawar D. 2018. Advanced storage and packaging technologies for durable and perishable foods. Technical Bulletin No. CIAE/APPD/ 2018/242.

### Popular articles

Jat D, Chandel NS and Imran S. 2018. Lahsun harvester. Krishak Jagat Magazine, 25: 7. MP Edition.

Kumar M, Sahni RK, Waghaye AM and Nayak A. 2018. Precision irrigation technologies: A present need to save for future. (biotecharticles.com/Agriculture-Article/Precision-Irrigation-Technologies-A-Present-Need-to-Save-for-Future-4382.html)

Senthilkumar T. 2018. Operation and maintenance of rice transplanters (Tamil). Kovai Vanigam, 6(66) pp 6-9.

## PAPERS PRESENTED

**Papers presented in 52<sup>nd</sup> Annual ISAE convention and National Symposium on 'Doubling farmers income through technological interventions' held at AAU, Anand during 8-10 January, 2018**

Sl. No.	Abstract Title	Presented by
1.	Development and evaluation of fertilizer attachment to CIAE-SBI tractor operated two row sugarcane settling planter	Dr. T. Senthilkumar
2.	Effect of extent of rind removal on quality characteristics of sugarcane juice	Dr. Ravindra Naik
3.	Enhancing productivity of crop sensitive to water logging in vertisols through broad bed and furrow (BBF) and mole drainage	Dr. Ramadhar Singh
4.	Real time monitoring of polyhouse environment using sensors and PLC	Dr. CD Singh
5.	Change in carbon footprint pattern with age among submersible pumps at farmers' field in selected district of Madhya Pradesh	Dr. CK Saxena
6.	Design of structurally safe greenhouse using finite element method	Er. Ajit Kumar Naik
7.	Trend analysis and change point detection of rainfall for Andhra Pradesh and Telangana	Er. Abhishek M. Waghaye
8.	Evaluation of aqua crop model for wheat under irrigated saline environment	Dr. Mukesh Kumar
9.	Enhancing water use efficiency of groundnut system through improved irrigation methods and need based irrigation application	Dr. Yogesh A Rajwade
10.	Comparative evaluation of manually operated single row and double row vegetable transplanter	Dr. BM Nandede
11.	Development of split cell type metering mechanism for transplanting of plug type vegetable seedlings	Dr. BM Nandede
12.	Lab studies of site specific application of neem coated urea for cotton crop	Er. DS Thorat
13.	Interfacing load sensors and open source microcontroller for a weight based grading system for spherical fruits	Dr. SK Chakraborty
14.	Mechanical intra and inter row weeder for field crops	Dr. NS Chandel
15.	Optimization of dual tyne spacing for two stage fertilizer placement using response surface methodology	Dr. Dilip Jat
16.	Energetics of soybean ( <i>Glycine max</i> L.) crop production in central Narmada valley region of Madhya Pradesh	Dr. PC Jena
17.	Purification and concentration of alkali extracts from extrusion-expelled and defatted soy meal for soy protein isolates using ultrafiltration	Dr. LK Sinha
18.	Design and analysis of self propelled multi-utility platform for orchard management system	Dr. AK Roul
19.	Resistance and distribution pattenrn of air flow in bulk onions	Dr. A E Kate

### Papers presented in Other Conferences/ Seminars, etc

Sl. No.	Abstract Title	Presented by	Event	Place and Date
1.	Development of No-till plot drill for conservation agriculture	CK Sawant	National Seminar on "Organic waste management for food and environmental security"	ICAR-IISS, Bhopal during 8-10 February 2018
2.	Sustainable management of agricultural crop residues (paddy straw and soybean straw): Briquetting	HM Wakudkar		

## PAPERS PRESENTED/ REPORT

Sl. No.	Abstract Title	Presented by	Event	Place and Date
3.	Development of garlic peeler for domestic use	Dawn CP Ambrose	International conference on Emerging Synergies in Agriculture, Food Process Engineering and Bio Technology	Karunya Institute of Technology and Sciences, Coimbatore during February 21-23, 2018
4.	Optimization of process protocol for banana central core juice production ( <i>icafb/fpe/009</i> )	R Naik		
5.	Development of fermenter for submerged fermentation of millets	Sadvatha, RH		
6.	Performance evaluation of tractor operated cassava stake cutter planter	T Senthilkumar		
7.	Development and evaluation of dual tyne two stage fertilizer applicator for broad beds in vertisols	Dilip Jat	33rd M.P. Young Scientist Congress	Rani Durgavati Vishwavidyalaya, Jabalpur (M.P.) during March 15-16, 2018
8.	Development of tractor drawn three row automatic vegetable transplanter for plug type seedlings	AP Pandirwar		
9.	Automated irrigation systems for rice: a review	M Kumar	National Conference on Digital and Engineering Technologies for Precision Agriculture and Value Addition	CAE, Bapatla during February 26-27, 2018
10.	Development of GUI based software for estimation of evapotranspiration using FAO-56 Penman-Monteith method	SP Kumar		
11.	Estimation of various loads act on the double arch type greenhouse	A Nayak		
12.	Processing and value addition to millets for better nutritional security	D Mohapatra	National Conference on Women Empowerment, Education, Environment, Biodiversity, Health and Agriculture	Vigyan Bhawan, M.P. Council of Science and Technology, March 23-24, 2018

### Republic Day Celebrations

Republic Day was celebrated on 26 January, 2018 with great enthusiasm. The flag hoisting was done by the Director, Dr. KK Singh. Officers and employees of the Institute were present on this occasion. The Director extended his good wishes to everyone present on the occasion. He gave a brief outline about some important achievements of the Institute and its pivotal role in the field of agricultural achievements.



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### Foundation Day Celebration

To celebrate the Institute's 43<sup>rd</sup> Foundation Day, two day programme was organized during 15-16 February, 2018.

The institute level programme on 15 February was celebrated during a function attended by all the staff of institute. Dr. Ramakrishna Kusmaria, Member, ICAR -Governing Body and former Minister of Farmer Welfare and Agriculture Department, Govt. of Madhya Pradesh was the chief guest. Dr. KK Singh, Director, ICAR-CIAE, Bhopal made a presentation about various achievements of the institute and highlighted about various technologies developed during 2017-18 like high clearance vehicle, vegetable transplanter, inter and intra row weeder, image based herbicide applicator, sub-surface drip lateral laying machine and enhancing shelf life of various millet products, etc. Dr. Kusmaria lauded contribution of ICAR-CIAE in the field of Agricultural Engineering at regional, national and international perspective. He encouraged the scientists to develop technologies keeping in mind the interest of the small and marginal farmers. A poster competition on the themes 'Agricultural engineering technologies for doubling farmers income' and 'Agricultural engineering scenario by 2050' was organized for scientists and doctoral students, respectively.



A Farmers' meet and agricultural machinery exhibition was organized on 16 February, 2018 with a theme "Role of Mechanisation in Doubling the Farmers' Income". About 1500 farmers and entrepreneurs from neighbouring districts participated in the programme. They listened to technical deliberations on the available technologies and their potential economic benefits and also saw different types of machines and technologies showcased by ICAR-CIAE, ICAR-IISS, ICAR-NIHSAD, Directorate of Agricultural Engineering and various commercial manufacturers. Dignitaries like Dr. Gajendra Singh, Ex DDG (Agricultural Engineering), ICAR; Shri Rajeev Choudhary, Director, Agricultural engineering, Govt. of Madhya Pradesh; Shri Abhay Malaiya, President, MP Agricultural equipment manufacturers Association, and Members of Institute Management Committee were also present. On this occasion a tripartite agreement was signed between ICAR-CIAE, Bhopal, Directorate of Agricultural Engineering, Madhya Pradesh and M/s Veda Farms & Implements Pvt. Ltd., Bhopal to manufacture quality agricultural machinery at Sehore district, Madhya Pradesh.



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Following successful entrepreneurs and progressive farmers who undertook training at ICAR-CIAE in the areas of management of custom hiring centre, soybean processing and utilization and protected cultivation technology were also felicitated for their innovative ideas and adoption of new technologies.



Mr. Shyam Kushwaha  
Gol Khedi, Bhopal  
(Progress farmer -  
Protected cultivation  
farming)



Mr. Mishrilal Rajput  
Khajuri Kala, Bhopal  
(Progress farmer -  
Protected cultivation  
farming)



Mr. Deepak Gour  
Arvaliya, Bhopal  
(Progress farmer -  
Protected cultivation  
farming)



Mr. Amit Bajaj  
New Delhi  
(Entrepreneur -  
Soybean processing and  
utilization)



Ms Alka Khairnar  
Nasik, Maharashtra  
(Entrepreneur -  
Soybean processing and  
utilization)



Mr. S. Bachittar Singh  
Garcha, Sangrur, Punjab  
(Entrepreneur -  
Soybean processing and  
utilization)



Mr. Kamlesh Sahu  
Baigumpura, Raisen  
(Entrepreneur -  
Custom Hiring of  
Agricultural Machinery)



Mr. SS Raghuwanshi  
Shivpuri  
(Entrepreneur -  
Custom Hiring of  
Agricultural Machinery)

### Talk on Food safety, Quality and Nutrition innovation in food industry

The Association of Food Scientists and Technologists (AFST (I)) Bhopal Chapter organized a talk of Dr. TSR Murali, Chief R&D officer and Quality Head - Mother Dairy, New Delhi on 3 January, 2018 at the Institute. Scientists engaged in food processing R&D activity and PhD students of ICAR-CIAE attended it.

### SAC meeting of KVK

Scientific Advisory Committee meeting of KVK, CIAE was held on 12 January, 2018. Dr. N Kowaliwale, I/c. Director chaired the meeting. Dr. RNS Banafar, DES; Dr. UPS Bhadoria, J. DES, RVSKVV Gwalior; Dr. Muneshwar Singh, Director-Incharge, ICAR-IISS Bhopal and district officers of line department & progressive farmers participated in the meeting.

Dr. UR Badegaonkar, Incharge-KVK presented Annual Report of KVK, CIAE for the year 2016-17, 2017 Kharif and action plan for the year 2017-18.



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### Brainstorming Session with Crop Science Institutes

Brainstorming Session cum Interaction Meet on 'Engineering Interventions for Production & Processing of Different Crops' was organized during 26-27 February, 2018. The programme was organized to identify crop specific problems that need engineering interventions and also to explore the possibility of collaborative mode research between crop institutes and ICAR-CIAE to provide the engineering solutions for mechanization/ processing/ energy problems for enhancing the input use efficiency, productivity and value addition aiming at doubling the farmers' income.



The inaugural session was attended by Dr. NP Singh, Director-IIPR, Kanpur, Dr. D Damodar Reddy, Director-CTRI, Rajamundry, Dr. RNS Banafar, Director-Extension Services, RVSKVV, Gwalior and around 60 participants from sixteen ICAR institutes across India under crop science SMD and ICAR-CIAE. Dr. KK Singh, Director in his welcome speech reflected upon the objective of the meet. During the technical sessions, lead presentations on available engineering technologies for crop production and processing were made by Dr. PS Tiwari and Dr. Nachiket Kotwaliwale, Heads of Divisions at ICAR-CIAE. Thereafter, presentations on specific requirements for different crops/ commodities viz. wheat, barley, maize, millets, tobacco, pulses, fodder crops, sugarcane, soybean, oilseeds, fiber crops, cotton etc. were made by

commodity experts. Various gaps in mechanization of production and post-harvest activities were put forth. After discussions, the mechanization issues raised by the speakers were addressed by identifying issues where: (i) technologies are already commercially available; (ii) technologies are available but need adaptation or minor modifications; (iii) collaborative research is required for new technologies; and (iv) collaborative evaluation of need is to be established. The researchable issues were prioritised based on quantum of need, area of crop and scope of adoption. Some of the priority areas identified for collaborative activities are; residue management in rice-wheat cropping, production and post-harvest mechanization in maize, tobacco, oilseed, pulses and millets; production mechanization in fibre crops, fodder crops, sugarcane and cotton. The outcome of the event will be beneficial to policy planners and researchers for new R&D initiatives at the national level for profitable agriculture.

### Academia-Industry-Interaction Meets

#### At Nagpur

An Academia-Industry Interaction Meet was jointly organized by ICAR-CIAE and ICAR-CIRCOT, Mumbai at Ginning Training Centre, ICAR-CIRCOT, Nagpur on 11 January, 2018. The meet was organized under the aegis of Consortia Research Platform on Farm Mechanisation and Precision Farming (CRP on FM & PF) to provide a common platform for one-one interaction between researchers, industries, policy makers and other stake holders. About 110 agricultural machinery manufacturers, researchers and policy makers from State and Central Government Organizations participated in this meet.

#### At Raipur

Another meet was organized in collaboration with Agricultural Engineering wing of the Department of Agriculture & Biotechnology, Govt of Chhattisgarh and the Indira Gandhi Agricultural University at Raipur during Rashtriya Krishi Mela 2018 on 25 January, 2018. Shri Brijmohan

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Agarwal, Hon'ble. Minister for Agriculture, Water Resources, Animal Husbandry and Fisheries, Govt of Chhattisgarh, was the Chief Guest. About 100 delegates participated in the interaction meet.

Shri MS Kerketta, Director, Agriculture and Biotechnology, Shri Alok Awasthi, IAS, MD, Chhattisgarh State Seed Corporation, Shri Sunil Agarwal, Additional Director (Engineering), Dr. VK Pandey, Dean College of Agricultural Engineering, IGKVV, Raipur, ICAR-CIAE Head of Agricultural Mechanization, Dr. PS Tiwari, Dr. Nachiket Kotwaliwale, Head of Agro Produce Processing Division and Dr. PC Bargale, Head, Technology Transfer Division and a large number of large, micro, small and medium scale manufacturers of Agricultural machinery attended the meet.

### Nutri Fair

The Institute in collaboration with Solidaridad, New Delhi organised Nutri Fair on 8 March, 2018 to commemorate International Women's Day. Nutri Fair was on the theme based programme to discuss on issues related to rural women and their nutritional aspects, along with the efforts

undertaken by different stakeholders in this regard. The event witnessed an overwhelming participation of around 1200 rural women from across the state and provided a platform for cross learning, encouraging rural women in agriculture and recognising the efforts of women leaders and entrepreneurs. The event was jointly organised through a consortium of stakeholders and partners engaged in advancement of sustainable agriculture, livelihood and women empowerment in different parts of Madhya Pradesh. Some of them were, Madhya Pradesh State Rural Livelihood Mission (MPSRLM), Mahindra, ITC Ltd, Reliance foundation and Vippy Industries. Delegates representing different government organisations, research institutions, agricultural universities, extension institutions, industries, corporate foundations, financial institutions, farmers and farmers' organisations graced the occasion through their participation in this full day programme. The event started with an inaugural ceremony followed by two panel sessions. The first session was an interactive knowledge sharing by rural women entrepreneurs and leaders on health and economic benefits of soy food products. This was followed by a session on technical know-how of nutritional aspects of soy products by different experts representing research institutions, organisations and health. The event also hosted an exhibition of stalls by the participating organisations and rural entrepreneurs on soy food processing technology. On International Women's Day, this event was an honest attempt to celebrate the spirit of rural women.

### Women's cell activities

An educational tour to ICAR-Indian Institute of Pulse Research, Phanda was organised for the women employees of ICAR-CIAE on 9 February, 2018. Female employees of CIAE visited various facilities at IIPR, Phanda, and interacted with the scientists to gain first-hand knowledge on pulse production.

International women's day was celebrated on 15 March, 2018. Dr. Anita Tilwari from MPCST was chief guest and Dr. Anita Tilwari delivered a



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lecture on “Women Empowerment” and the women sports persons, who won medals in ICAR Central Zone Sports Meet-2017 were felicitated. Several games and quiz competitions were also part of the function, where everyone participated with ardent fervour.

### IMC Meeting

51<sup>st</sup> Meeting of the Institute Management Committee was held on 16 February, 2018 under chairmanship of Director, CIAE, Bhopal. The meeting was attended by Prof. Gajendra Singh, Chairman, QRT of the Institute; Dr. PL Singh, Principal Scientist, Agricultural Engineering Division, ICAR; Dr. Man Singh, Project Director, WTC, IARI, New Delhi; Dr. Anil Kumar Dubey, Principal Scientist, CIAE, Bhopal; Dr. G Senthilkumaran, Principal Scientist (FMP), IIHR, Bengaluru; Dr. AK Singh, PS & Head, NDRI, Karnal; Shri Ravindra Kumar, FAO, Indian Institute Soybean Research, Indore and Shri Ravi Kumar, Chief Administrative Officer, CIAE. The meeting was also attended by Heads of Department, Project Coordinators, Incharge-KVK, FAO and AAO (Admin). Dr. Nachiket Kotwaliwale, Head, APPD made a presentation on Engineering Intervention – Contribution towards doubling farmer's income.



Prof. Gajendra Singh, Ex-VC, Doon University, Ex-DDG (Engg.), ICAR and Chairman, QRT presented the Report of the Quinquennial Review Team (QRT), XII Plan (2012-17). He presented major issues emerged during the visits of quinquennial review team and recommendations emerging out of it.

Thereafter, agenda items were discussed.

### IRC meeting

The 100<sup>th</sup> IRC meeting was held during January 23-25 and 27, 2018. Following new projects were approved in this meeting:

#### *Institute Projects*

- Development of mechanized CA Model Farm for major cropping systems in vertisol of Central India
- Development of ZT Seed-cum- Ferti Drill for combine harvested rice field
- Retrofitting urea solution spraying system on paddy straw baler
- Development of controlled-release fertilizer applicator as an attachment to rice transplanter
- Mechanization package for pigeon pea cultivation for raised bed and ridge
- Mechanization package for garlic cultivation on raised beds
- Development of side trencher-cum-FYM applicator for grapes orchard
- Design and development of induction based air assisted electrostatic sprayer
- Development of tractor operated fertilizer applicator for grape vineyard
- Development of process and pilot plant for extraction of dietary fibre from soybean and chickpea hull
- Evaluation of structural stability of greenhouse using wind tunnel
- Optimisation of ventilation in naturally ventilated greenhouse using Computational Fluid Dynamics
- Assessment of draught animal power availability for selection of suitable package of animal drawn implements in MP
- Development of bullock drawn planter for ridge and furrow sowing of soybean and chickpea cropping system
- Design and Development of Mechanized slicer for cashew apples (in collaboration with ICAR Directorate of cashew Research, Dakshin Kannada , Karnataka)
- Development of tractor operated pigeon pea transplanter

#### *Externally Funded Projects*

- Post-harvest management of medicinal root crops (Funded by National Medicinal Plant Board, Ministry of Ayush; Budget: Rs.64.26 lakhs)
- Pilot project on solar powered micro irrigation system (Funded by NCPAH; Budget: Rs.25.28 lakhs)

## REPORT

### RAC Constituted

Research Advisory Committee of the Institute has been reconstituted with following composition for a period of three years w.e.f. 3 February, 2018:



**Dr VM Mayande**  
 Former VC, PDKV, Akola  
**Chairman**



**Dr. Debraj Behera**  
 Prof & Head  
 Deptt of Farm machinery &  
 Power, OUAT, Bhubneswar  
**Member**



**Dr. Man Singh**  
 Project Director, WTC,  
 ICAR-IARI, New Delhi  
**Member**



**Dr. VVN Kishore**  
 Former Head, Department of  
 Energy & Env.,  
 TERI University, New Delhi  
**Member**



**Dr. JIX Antony**  
 New Health  
 Platform Lead,  
 NESTLE, Gurgaon  
**Member**



**Dr. KK Singh**  
 Director, ICAR-CIAE  
**Ex-Officio Member**



**Dr. KK Singh**  
 ADG (FE), ICAR  
**Ex-Officio Member**



**Dr. PC Bargale**  
 Head, TTD  
**Member-Secretary**

The 23<sup>rd</sup> meeting of the newly constituted Research Advisory Committee of ICAR-CIAE was held during 22-23 March, 2018. The Heads of the Divisions, Project Coordinators of AICRP on FIM, EAAI, UAE and ESA and scientists of CIAE attended the meeting. Dr. KK Singh, Director CIAE welcomed the Chairman and the Members of the newly constituted Research Advisory Committee. In his welcome address he briefed members about the mandate and scope of work for ICAR-CIAE and highlighted some of the major achievements of the institute during recent years. This included study undertaken by ICAR-CIAE in collaboration with ICAR-NCAP on impact of selected 17 CIAE technologies on Indian economy, which had revealed that commercialization and adoption of these technologies was contributing over Rs. 4000 cores per annum to the national economy. He also informed that recently CIAE had released 27 new technologies and their commercialization was under process. Based on Entrepreneurship Development Programmes (EDPs) conducted by CIAE, over 1000 Custom hiring centres and about 200 soy based enterprises were operating successfully. He expressed gratitude to the RAC members for accepting to be member of ICAR-CIAE and hoped their expert input would help CIAE to undertake more relevant R&D projects.

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### WORKSHOP OF AICRPs

#### Workshop of AICRP on EAAI

The XXI workshop of the ICAR- All India Coordinated Research Project on Energy in Agriculture and Agro-based Industries (ICAR-AICRP on EAAI) was held at Tamil Nadu Agricultural University (TNAU), Coimbatore during 17-19 January, 2018 to review the progress of the approved projects under various components during 2017-18 and to consider the new projects proposed by the different cooperating centres of the Project for approval.



Dignitaries present during the inaugural session of the workshop included Dr. K Ramasamy, Honorable Vice Chancellor, TNAU, Coimbatore; Dr. K Alagusundaram, Deputy Director General (Engineering), ICAR, New Delhi; Prof. BS Pathak, Ex-Director, Sardar Patel Renewable Energy Research Institute (SPRERI), Vallabh Vidyanagar, Dr. S Kamaraj, Ex-Prof. & Head, Bio-energy Department, Agricultural Engineering College & Research Institute (AEC&RI), TNAU, Coimbatore, Dr. M Maheswaran, Director of Research, TNAU, Coimbatore, Dr. SV Kottiswaran, Dean (Engg.), AEC&RI, TNAU, Coimbatore and Ms. Rasha Omar, Country Representative of International Fund for Agricultural Development (IFAD). Dr. M Maheswaran welcomed the participants to the workshop.

It was followed by the presentation of glimpses of progress of the scheme during 2017-18 by Dr. KC Pandey, Project Coordinator (AICRP on EAAI). On this occasion, four publications - Research Highlights cum PC Report 2017-18, a folder on Genesis & Overview of the AICRP on EAAI, Directory of Manufacturers and Suppliers of RETs and a Success Story on Large Scale Fixed Dome Biogas Plant were also released. Dr. Kottiswaran presented formal vote of thanks. Seven technical sessions were organized and was chaired by Dr. K Alagusundaram. An interaction meet with Renewable Energy Gadget Manufacturers was also organized for accelerated promotion of proven renewable energy technologies.

#### Workshop of AICRP on UAE

The XVII Annual Workshop of All India Coordinated Research Project on Utilization of Animal Energy with Enhanced System Efficiency (AICRP on UAE) was held at Vasant Rao Naik Marathwada Krishi Vidyapeeth (VNMKV), Parbhani during 30-31 January, 2018.



The workshop was inaugurated on 30 January, 2018 under the Chairmanship of Dr. BS Prakash, ADG (Animal Nutrition and Physiology), ICAR. Dr. B Venkateswarlu, Hon'ble Vice-Chancellor, VNMKV, Parbhani was the Chief Guest and Dr. SK Rautaray, Ex-PC, AICRP on UAE was the Guest of Honour. Dr. DP Waskar, Director Research, VNMKV, Parbhani in his welcome address emphasized the importance and usefulness of the project in the Marathwada region, as the region has vast population of draught animals. On this occasion, technical bulletins, success stories, a documentary on threshing equipment operated by animal power in rotary mode in Odia language and others were released.

## REPORT

### Webcast Programme of Honourable Prime Minister

Hon'ble Prime Minister of India inaugurated the National Conference of Krishi Vigyan Kendras on 17 March, 2018 at ICAR-IARI, New Delhi and at this occasion started 25 New KVKs in the country. He also addressed the farmers and agricultural scientists about doubling farmer's income, through live telecast, reaching out to 7 lakhs progressive farmers through 681 KVKs throughout the country.

The Institute arranged farmers' gathering to watch the live webcast programme, in which more than 1000 farmers, scientists, state departments and other stakeholders participated and watched the programme. Shri Vishwas Sarang, Honourable Minister, Govt. of M.P. graced the occasion as Chief Guest and Dr. Sasikala Pushpa, Honourable Member of Parliament (Rajya Sabha) as the Guest of Honour. Shri Harjinder Singh, IAS & CEO, Jila Panchayat, Bhopal also participated in the programme. The programme was organized by ICAR-CIAE jointly with ICAR-IISS and ICAR-NIHSAD, Bhopal. In his welcome address, Dr. KK Singh, Director, CIAE mentioned about the activities of CIAE, IISS and NIHSAD, Bhopal in serving the farming community. Chief Guest Shri Vishwas Sarang in his address emphasized the importance of farmers in development of the nation and the commitment of the Government towards it. Guest of Honour, Dr. Sashikala Pushpa, highlighted about the seven point agenda of Prime Minister to double farmers income.



### Visit of Minister of Agriculture, Bihar

Dr. Prem Kumar, Hon'ble Minister of Agriculture, Bihar and Shri Ravindra Nath Ray, Special Secretary (Agri), Government of Bihar visited the Institute during 3-5 February, 2018. Shri Rajiv Choudhary, Director, Department of Agri Engg, Govt of MP and Shri NK Lohani, Assistant Director (Engg.), Govt of Bihar were also present.



## PERSONNEL NEWS

### Our New Colleague



Shri Rahul Chouksey has joined as SSS on 23 March, 2018.

### Staff Superannuated

Following staff superannuated from the Council's service and they were given a warm farewell:



**Shri CSP Verma**  
Technician  
31 January, 2018



**Shri SK Thakur**  
SSS  
31 January, 2018



**Dr AC Saxena**  
Principal Scientist  
31 January, 2018



**Shri Munnavar Ali**  
Technical Officer  
28 February, 2018



**Shri SK Lal**  
Technical Officer  
28 February, 2018



**Shri GG Iyer**  
Private Secretary  
1 March, 2018  
(took VRS)



**Shri RB Sahu**  
Technical Officer  
31 March, 2018



**Shri Suresh Kumar**  
Technical Officer  
31 March, 2018



**Shri SK Sakalley**  
Technical Officer  
31 March, 2018

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**Word Processing:** K. Shankar

**Photography:** M/s SS Bagde and Kalyan Singh

**Publisher:** Director, ICAR-Central Institute of Agricultural Engineering,  
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