



# CIAE

# NEWSLETTER

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Modernizing agriculture through engineering interventions



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## From the Director's Desk



In modern agriculture, farm mechanization has become imperative to growth and sustenance as it facilitates the judicious utilization of crop inputs. Use of available farm power with efficient farm implements has resulted in increased farm productivity. Nevertheless, horticulture is one of the most potential sectors for economic development, employment generation and sustainable management of bio-resources. A wide variety of crops including vegetables, fruits, ornamental, plantation, spices, root and tuber crops, mushroom, medicinal and aromatic crops contribute about 33% to agricultural GDP of India. It is a matter of pride that India is the largest producer of vegetables and second largest producer of fruits in the world and over the past decade, the agriculture sector has witnessed significant increase in horticulture production. The area under

horticulture has grown by about 3% per annum and annual production has increased by 5.4%. During 2016-17, production of the horticulture crops was about 295.2 million tonnes from an area of 24.9 million hectares. Moreover, in the past one decade, the change in cropping pattern is more inclined towards the horticulture sector and commercial crops, as food consumption pattern is constantly changing owing to the heightened nutrition and health awareness.

Each segment of its development covering research, production & productivity, post-harvest care and management, marketing and processing has to be adequately addressed. Mechanization needs to be taken up in two major areas viz. enhancing the productivity of labour through effective tools & implements and making available more number of farm machinery to the beneficiaries. Because of the diverse nature of horticultural crops, mechanization requirements of different horticultural crops are widely varied and more so, crop specific. Most of the critical operations like nursery raising, transplanting, earthing up, weeding and intercultural operations, pruning, picking/harvesting, etc. are generally carried out manually and are labour intensive and also involve a lot of drudgery and sometimes risk to life. In India, horticulture mechanization is almost at an infancy and for the growth of this sector; there is an immediate need for technological interventions in terms of mechanization.

ICAR-CIAE has been making consistent efforts for development of complete mechanization package of various operations for horticulture crops like banana and vegetable crops. With a production of 29.12 million tonnes, banana is one of the major fruit crops in India, and requires special mechanization packages pertaining to production and post production management practices. To cater to the demand of banana growing farmers, a number of tools and equipment such as Banana pseudo stem injector that injects chemicals into the banana pseudostem for management of pests, banana debuncher harvester that cuts and loads the banana bunch, banana sucker pairing device that removes the outer skin of banana have been developed and are being presented in this issue. Transplanting of soft vegetable crops is also one of the major operations and requires special machinery to handle the soft tissue, without damaging the plant parts. A number of equipment and machinery for planting and interculture operations of vegetable crops pot type seedlings, ginger planter are also being presented in this newsletter that can save a lot of labour and reduce drudgery. Furthermore, carrying out interculture operations in tall field crops and vegetable crops like sugarcane, cotton, pigeon pea, tomato, brinjal, etc. is difficult using tractor operated implements, for this purpose a high clearance vehicle has been developed, which takes care of the issues like labour cost with improved efficiency for making significant contribution to the field and horticultural mechanization. Apart from these machinery a number of equipment like cassava harvester, planter cum herbicide applicator, fertilizer applicator-cum-ridger are also being presented.

Events like International Yoga Day and World Honeybee Day have been celebrated with great enthusiasm and fervour. I also take this opportunity to wish 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

### High clearance multipurpose vehicle

Certain operations like weeding, spraying and harvesting can not be conveniently performed using normal tractors/ power tillers in tall crops with varying crop geometry. Expensive solutions are being imported, which have variable ground clearance and track width. An indigenous self-propelled hydraulically actuated multipurpose vehicle is an appropriate solution. The machine has been designed to carry out various operations like spraying, weeding, harvesting, etc. in field and horticultural crops like; cotton, pigeonpea, sugarcane, okra, tomato, brinjal, chilli, etc. It consists of hydraulically powered cooling, differential and disc type fail-safe brake system. It has provision for ground clearance (2 – 2.6 m) and track width adjustments (1.5 – 2 m). The developed vehicle is stable up to 45° and 20° at static and dynamic conditions, respectively on longitudinal slope and 39° and 22° at static and dynamic condition, respectively on lateral slope. The turning radius of the vehicle is 3.1 m and maximum speed of operation is 20 km/h. Maximum torque generates per wheel of the vehicle is 2500 Nm. The developed vehicle has been tested in okra field with an average height of 1.1 m. It gives field capacity of 1.4 ha/h for spraying operation.



### Tractor mounted ginger planter

Due to its irregular shape it is very difficult to plant ginger using available mechanical planters. The manual operation, presently performed, involves placement of rhizomes and making ridges, which is a time and labour intensive task. A tractor mounted ginger planter is suitable for

ginger rhizome planting of size 25 to 50 mm at mean depth of 8 cm and at seed rate of 1200 kg/ha. The overall dimensions of equipment are 1450×2200×1241 mm. It consists of main frame, ginger rhizome planting mechanism and ridger bottom. The planting mechanism includes rhizome hopper, cup type metering mechanism, agitator, metering shaft, chain and sprocket type power transmission system, runner type furrow opener and ground wheel. It gives capacity and field efficiency of 0.32 ha/h and 85%, respectively at forward speed of 2 km/h with average miss and multiple indices of 0.9 and 0.26, respectively. The equipment costs Rs. 60,000. Cost of operation is 1435 Rs/ha and requires 6.25 man-hour/ha. There are savings of 51% and 88% in cost of operation and labour, respectively as compared to traditional method of planting.



### Real time uniform spraying system for field crops

Maintaining uniformity of spray volume during plant protection operations is very difficult and inaccurate operations result in over or under application of the agro chemicals. Real-time uniform spraying system maintains uniform spray volume throughout the field irrespective of speed of operation. It consists of hall effect sensor IC, magnetic ball, micro-controller, servo motor, flow rate controller, HTP pump, tank, hoses, boom, nozzle, etc. The micro-controller receives input signals for forward speed through hall effect sensor, installed on the front wheel of the tractor. The error of speed measurement with hall effect sensor is found to be  $0.64 \pm 0.08\%$ . The

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### Package of selected machinery for banana crop

Machinery package under development consists of pseudo stem injector, bunch harvester and sucker paring device suitable for the banana crop. These machines are commercially not available. The package of machines would undergo field evaluation during next cultivation season.

#### **Banana pseudo stem injector**

The pseudo stem injector is required for providing plant protection treatment against pest attack and insect growth into the pseudostem of banana. Additionally it helps to avoid indiscriminate application of the chemical on the pseudostem sheath. The banana psued stem injector consists of chemical tank, peristaltic pump, control unit with non-return valve and injector. The injector is made of S.S Material 304 Grade of 7.5 cm length and 2 mm sharp tip. The chemical tank is made of plastic with storing capacity of 16 l. The peristaltic pump is attached to pump the liquid from chemical tank to injection system. The control unit is attached with electronic embedded system to control chemical quantity and depth of injection by 8 mm I/P & O/P screw variable valve.



#### **Banana bunch harvester**

Banana bunch harvester consists of main frame (70×60×1450 mm), harvesting boom (70×60×2650 mm), bunch holding system, bunch cutting system, hydraulic system and power transmission system. The main frame is designed to attach in front of the mini tractor chassis. Harvesting boom and bunch holding and cutting assembly are operated through a hydraulic cylinder powered by tractor PTO.



#### **Banana sucker paring**

Banana sucker paring device aims at removing the outer sheath of various sizes of suckers, trim and make them ready for sucker treatment. The equipment consists of rotating conical holder that holds banana suckers firmly against rotating blades mounted on conical drum and operated through an electrical motor. A holding mechanism is provided with the sliding provision for proper adjustment of the sucker. The size of the equipment is 1080×550×1250 mm.



developed system has been evaluated in the field for application rate of 300 l/ha at 2 kg/cm<sup>2</sup> pressure. With change in forward speed between 2.43 to 4.5 km/h, the application rates are found to be in the range of 293.8 to 298.4 l/ha corresponding to the targeted application rate of 300 l/ha. The effective field capacity of the machine is 0.7 ha/h at 3 km/h.



## RESEARCH & DEVELOPMENT

### Cassava harvester

The manual practices of cassava harvesting is time consuming and involves drudgery. In order to address the issue, a tractor operated single row cassava harvester-cum-collector has been developed. The unit consists of main frame, digging unit, lifting and conveying units and power transmission system. The main frame (2000 x 100 mm) is designed to provide sufficient strength under torsional stresses. It is used for mounting digger bottoms, hitch frame and conveying system. The conveying system involves two parallel endless belts fitted in the rectangular frame of size 1500 x 40 cm with guide pulleys, tensioning pulleys and set of counter rotating rubber wheels. The equipment operates by a 50-60 hp tractor. It digs and lifts cassava tubers from the ground and conveys and collects at end. An effective field capacity of the harvester is 0.22 ha/h. It is estimated to save 60% cost compared to manual harvesting.



### Brush cutter with fruit holding attachment for pineapple harvesting

Traditionally pineapple is harvested manually using a special knife. Also some of the leaves of pineapple plant are pruned prior to detaching the fruit from the plant as a pre-harvest operation in Kerala region. An improved unit for harvesting of pineapple has been developed (AICRP on FIM - Tavanur centre) that consists of a brush cutter



with backpack type engine and manual fixed holder (weight 1.3 kg) with movable base plate (150 mm size). The weight of brush cutter with attachment is 4.85 kg. The distance between the blade and holder is adjustable in the range of 30 mm. The height between the base plate of holder and blade is 25 mm. The speed of blade and fuel consumption of unit is 6500 rpm and 1.1 l/h, respectively. The average time for harvesting 10 fruits is 4 min. The maximum diameter of fruit which can be harvested is 140 mm.

### Evaluation of improved Turmeric polisher for dust reduction

Conventionally, turmeric is polished in rotary type, octagonal shaped drum covered with expanded wire mesh. Polishing is affected by rubbing and abrasive actions of turmeric rhizomes one over the other and over the metal surface. The removed skin pieces are thrown out through the perforations in the drum by the centrifugal force due to the rotary motion of the drum and produce a dusty atmosphere in the polisher operating area. In the existing polisher, there is no provision for dust collection which lead to the respiratory problem for the operator and hazard to the environment.

The improved turmeric polisher developed at AICRP on ESA - Coimbatore centre, of 600 kg per batch capacity is provided with a special cover (nylon 6-6 SRF-nylo grade I, 760 GSM) possessing the characters of 100% waterproof, highly durable, very tough to tear, repairable by heat sealing, stays light in rains, easy to handle, fungus and termite resistant and UV stabilized. The improved dust proof polisher can trap 99.4% of the emerging dust from the polishing action.



## RESEARCH & DEVELOPMENT

### Planter cum herbicide applicator for direct sowing of paddy

A commercial 9-rows planter having vertical rotor type metering mechanism has been converted in a planter cum herbicide applicator suitable



for direct sowing of paddy (AICRP on FIM-Bapatla Centre). The boom sprayer of 2700 mm length having 4 nozzles with swath width of 700 mm and 240 l water capacity tanks have been used as attachment to planter. Two tanks having capacity of 120 l each are mounted on planter platform on both sides of seed cum fertilizer hopper. A 2.24 kW pump of 36 l/s capacity is mounted on planter frame in between top and lower links and connected to PTO shaft of tractor to run the spraying unit. The planter cum herbicide applicator has been evaluated at farmer's field in clay loam and black cotton soils for direct sowing of paddy. It plants and applies herbicide in a single pass. The effective field capacity and field efficiency of planter are 0.4 ha/h and 90% for both soils at 15-20% (db) moisture content. The fuel consumption of 34 kW tractor for this planter cum herbicide applicator is 3 l/h.

### Bullock operated fertiliser applicator-cum-ridger

Manual method of ridging and fertilizer application in maize crop is becoming costly due to shortage of labour. At the same time in small holdings where animal powered implements have potential to be used needs to be designed considering the comfort of the animals. The bullock drawn fertilizer applicator-cum-ridger (AICRP on UAE – Bhubaneswar centre) has a fertilizer box and a ridger fitted on a beam with adjustable links. The fertilizer box has got a pair of wheels for driving two cup type metering mechanisms and two delivery tubes to deliver fertilizer at desired rate in the row near to the



plants. The ridger which is a two way mould board plough helps to cover the bands of fertilizer, applied earlier with soil. Its field capacity is 0.05 ha/h with field efficiency of 67.94% at average depth of operation of 11.8 cm. The average draft of the developed ridger-cum-fertilizer applicator has been found to be 270 N which is well within the capacity of a pair of bullocks. The overall fatigue score of the bullocks has been observed as 14.5 after 1 hour continuous operation indicating that the equipment has been pulled comfortably by them. The cost of operation of maize ridging with fertilizer application has been found to be Rs.2290/- per ha against the traditional ridging method of ridging (Digapahandi plough) Rs.2740/- per ha.

### Pilot plant for minimal processing of cut vegetables

Processed cut vegetables are gaining popularity among the urban consumers especially in the families where both spouses are working. Currently, the cut vegetables available in supermarket are processed manually and their shelf life is limited to 1-2 days due to inappropriate processing conditions and lack of hygiene during manual handling, more so, the



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### Pilot scale set-up for production of ready to eat complimentary food spread

Complementary foods for special groups are the need of the hour as the nutritional requirement of each group is different. The newly developed production line for *Comfo* spread comprising of a grain roaster, mixer/grinder, hammer mill, colloidal mill, tray dryer and packing/sealing machine has the potential to produce 10 kg/batch. Preparation of comfo spread involves i) roasting at 100 °C for 30-40 minutes and deskinning of peanut by using a peanut roaster, ii) grinding of roasted peanuts in a mechanical grinder (capacity: 50 kg/batch ) in two stages, and mixing of other ingredients such as salt, sugar, cocoa powder, moringa leaf powder and stabilisers, iii) homogenization in a stainless steel colloidal mill (10 kg/batch) which also serves as an intermediate mixing and storage point, iv) addition of vegetative oil for making a smooth textured spread mixture and finally, v) cooling and cup sealing of the spread. The comfo spread has 34% protein, 28% fat, 3.5% moisture, 12.5 mg/100g Phosphorus, 17.9 mg/100g Iron, and 95% Antioxidant activity (% RSA) and pH value of 6.23 with a shelf life 4 months at room temperature.

Pilot scale set-up for production of complementary spread



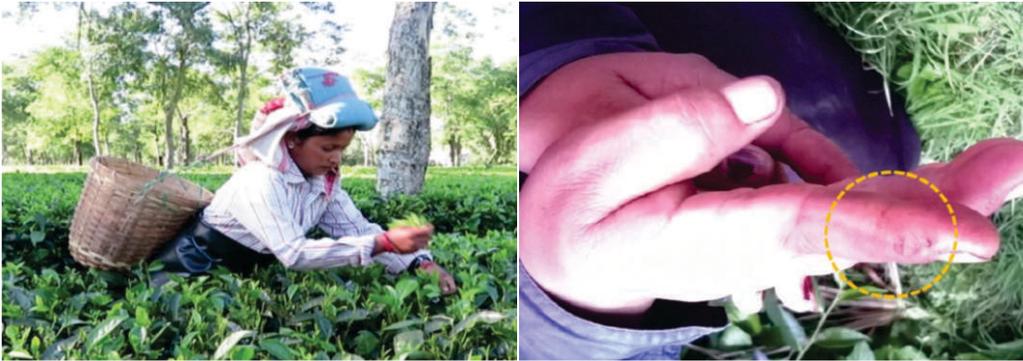
process is labour intensive and time consuming. In order to address the above issues, a pilot plant for minimal processing of cut vegetables has been developed using adopted/developed machinery with a capacity of around 100 kg/h. The machinery, like a vegetable cutter, cauliflower floret cutter, washing cum treatment tank, ozone generation system, basket centrifuge, UV chamber and belt conveyors have been developed/adapted for production of minimally processed fresh cut vegetables (carrot, cabbage, cauliflower) with a capacity of around 100 kg/h. Process protocol have been developed for treatment of cut vegetables in ozonated water, surface moisture removal in a basket centrifuge, packaging and UV treatment of packaged products that increases their shelf-life as compared to traditional chlorine treatment. The cut vegetables processed through the developed pilot plant can be stored up to around 9-12 days under refrigerated

conditions and 2-3 days under normal room conditions. The process utilizes no harmful chemicals and hence effect of harmful chemical residues are eliminated. Pilot plant is suitable for establishing an enterprise in peri-urban areas of vegetable production catchment.

### Assessment of occupational issues in tea leaf plucking and development of tea leaf plucking aid

The occupational problems and issues have been studied with 30 tea leaf plucking workers (10 male and 20 female) from the Banderdewa and laluk tea garden. The postural discomfort in the tea plucking operation has also been assessed using RULA analysis. The subjective analysis for body part discomfort is also being conducted to know the discomfort at different body parts like neck, shoulder, upper arm, elbow, forearm, wrist, etc. Approximately 80% of worker raised their

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concern regarding finger injury and discomfort due to basket used for collecting the tea.

The finger mounted plucking aid helps in cutting the leaf instead of tearing with bare hand. A thin metal circular guard has been provided in the forefinger and a sharp cutting mechanism in thumb. With the help of these two fingers the tea leaf is being plucked. Further, the tea collecting basket is also made of cloth with bigger radius opening and shoulder support instead of bamboo basket is being used. The basket is also fitted with a sun protective aid.

### **Energetics of production and post production of soybean-wheat crops in Madhya Pradesh**

Energy input and output analysis of soybean-wheat crops production is used to identify the energy intensive farm operations and find the way to minimize the energy input at different levels of productivity. Hence, energetics of soybean-wheat cropping system was undertaken to quantify energy input in different farm operation and their relation with energy output. The energy productivity and energy use efficiency for soybean crop have been found to be 0.08 kg/MJ and 2.26, respectively, whereas the values are 0.22 kg/MJ and 5.26, respectively for wheat crop. Cost of production for soybean and wheat varies from Rs. 16580-17438 and 31047-33381 per ha, respectively according to land holding size of the farmers. It has been observed that the tillage operation with MB plough and cultivator was energy intensive operation at the farmer's field for both the crops. The intervention of rotovator in seedbed preparation has the potential to save 25.41% and 39.18% energy

input required in soybean and wheat crop, respectively. The intervention of rotovator for the tillage operation at farmers' field can save up to 25.41% and 39.18% energy input in soybean and wheat crop, respectively. The post production energy requirement for soybean and wheat has been found to be 41.46 and 44.01 MJ/q, respectively when using tractor for transport operation.

### **Seed drill test rig**

The sticky belt test rig for testing of complete seed drill consists of hydraulic power pack, hydraulic cylinder, mounting arm, variable power drive, starter, electric motor (10 hp), transmission system, sticky belt setup and stand. Overall dimensions (LxWxT) of the setup are 5440x2400x550 mm. The variation in dropping of seed and fertilizer from different feeding outlets, variation in quantity of seed and fertilizer dropped per hectare, quantity specified to be dropped at a particular setting, variation in seed rate due to box filling and seed damage can be measured with the help of developed set up.



## TECHNOLOGY TRANSFER

### SUCCESS STORY

#### **Protected Cultivation Practices: A boon to Madhya Pradesh Farmers for improving their livelihood**

With the combined efforts of Government of India, Madhya Pradesh State Horticulture Mission and Precision Farming Development Centre established at ICAR-CIAE, Bhopal, the protected cultivation practices are gaining momentum in Madhya Pradesh State. The area under drip irrigation has increased from about 90,000 ha in 2012-13 to over 2,50,000 ha in 2017-18. Similarly, the total area under shadenet house and polyhouses increased from 26.0 ha to over 300 ha during this period. The staff of PFDC provides technical support to the state government in advocating these practices amongst the farming communities. The regular training programmes organized on drip irrigation, plastic mulching technology and covered cultivation by the PFDC helped over 100 farmers of Madhya Pradesh state to establish drip irrigation, plastic mulching, shadenet houses, polyhouses etc. for enhancing their income over traditional farming practices. Some of the farmers like Vijendra Singh, Rajender Singh Rathore, Krishna Kawad, Narayan Singh and Radheshyam of Dewas district; Sanjay Kumar Gupta Shri Kamal Singh and Shri Kailash Bhale of Chindhwara district and Shri Syed Saeed Haider of Raisen district etc., who had been cultivating conventional field crops, after undergoing training and getting financial assistance from the State Horticulture Mission have adopted drip irrigation at a cost of Rs 0.8 - 2.5 lakh in an area of 1.2 - 6.0 ha for cultivation of onion, garlic, potato, tomato and chilli. They have earned a revenue of about Rs 3.0 - 5.0 lakh/ha annually during the last two years. The visit of PFDC staff to farmers' field and assistance over phone on the crop management practices, operation and maintenance of drip irrigation and fertigation systems from time to time helped the farmers in adopting modern techniques. These farmers believe that after cultivation of vegetables with drip irrigation system, they are not only saving water but also generating higher income as compared to earlier conventional cultivation practices. A network for marketing their produce has been developed in the district head quarter with the support from state horticulture mission, because of which the highly perishable vegetables are immediately sold in the market, preventing post-harvest losses.



Some of the shadenet house and polyhouse adopted farmers includes: Shri Md. Asfaq, Shri Suresh Mehar, Shri Makhan Singh, Shri Rajkumar Ahirwar of Raisen district, Shri Manish Patidar

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and Shri Hemant Kumar Patidar of Ratlam district, Shri Ajay Kumar Shahare of Seoni district, Shri Gajander Singh and Shri Vinod Parmar of Shajapur district, Smt. Mamata Varshney, Shri Deepak Gour and Shri Jamal Hussein of Bhopal district etc. All these farmers underwent training programme at PFDC Bhopal on protected cultivation techniques during 2013-15 and started cultivating vegetables (tomato, capsicum, cucumber, broccoli) and flowers (Gerbera and Roses) under shadenet houses/polyhouses. The structure size varied from

2000 – 4000 sq.m. By availing subsidy on these structures from State Horticulture Mission/ National Horticulture Board as well as with the financial support from banks these farmers could establish these structures as a business venture for cultivation of horticultural crops. The vegetable growers understood the advantages of offseason cultivation and earned a net profit of Rupees two lakhs to five lakhs in a season depending upon the type of crop from half acre to one acre land. The problems encountered by the farmers during the crop cultivation are being addressed by PFDC staff by paying a visit to the site or over phone depending upon the nature of the problem. With the adoption of such hi-tech horticultural practices the farmers' could not only able to get higher revenue over conventional crops but also able to employ four to five rural labourers in their protected structures. The success that these farmers achieved has become source of inspiration for other farmers of the region to adopt modern techniques in horticultural crops cultivation.

### SUCCESS STORY

#### **Soybased Nutrition Feeding Programme: A boon to the malnourished children in Madhya Pradesh**

According to NFHS-4 (National Family and Health Survey-2015-16), 38.4% of children under five years age are stunted (too short for their age) which indicates that, half of the country's children are chronically malnourished. Nutritional deficiency is a major cause for concern in Madhya Pradesh as well. About 28.5% of women have chronic energy (nutritional) deficiency indicated by body mass index (BMI). According to the recent news, Hoshangabad district is one of the malnourished districts of M. P. with about 47% neonatal mortality rate followed by 17% post-natal mortality rate (report of ICDS, Hoshangabad, 2016). About 15% children are suffering from severe malnutrition in the district.

To reduce the nutritional deficiency rate, Integrated Child Development Scheme (ICDS) is providing nutritious food through scheduled feeding programmes. In spite of these efforts, some children are in the stage of 3<sup>rd</sup> degree malnutrition. Such children are provided with special treatment and extra feeding of nutrition. Most of the children are suffering from grade-I and grade-II malnutrition.

In reference to above nutritional status, ICAR-Central Institute of Agricultural Engineering is creating mass awareness regarding technology of locally produced soybean based food products through awareness camps, participating in seminars (specially organized for Atal Bal Palaks,

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officials of ICDS), organizing exhibitions, Nutrition Mela and training to the SHG (Self Help Group) members to enlighten and skill development to prepare soy foods, so that soy foods may enhance the nutritional status.

After getting systematic training to prepare cost effective soy based food products, Self Help Group (SHG) members of different blocks are providing these nutritious products through Atal Bal Palaks to the malnourished Aanganwadi children to fulfill the nutrition requirement. After continuous supplementation of these soy products (20 g *Soysattu*, or 20 g soynuts or 25g soybiscuits/ day) for last 12 months, significant improvement was observed in the health of malnourished children.

### **Impact of the Programme**

**Pipariya Block:** There are 47 Aanganwadis which are adopted by 42 Atal Bal Palaks (social workers) of the Pipariya block. Collected data indicated that 620 malnourished children (grade –II) were present in the month of March 2017 before intervention of our programme. After creating awareness and supplementation of soy foods like *soysattu*, soynuts and soybiscuits regularly to these malnourished children, 46% (286) children gained weight during the intervention period. About 35.6% children who were in the category of Grade –II malnourishment, shifted to the grade- I malnutrition level, while 5.6% (35) children shifted to the normal category. About 23 (3.7%) children showed no change or reduction in weight and 55 (8.8%) children were not available to check their growth parameter as they left the place.

**Itarsi Block:** Total 66 Aanganwadis are adopted by 33 Atal Bal Palaks in Itarsi block. Before intervention of soy foods, 520 children were in the grade-II malnutrition status. After consumption of soy foods on daily basis, 91% children gained weight and 5% shifted to normal category. While there were 168 children suffering from grade-III malnutrition, out of these, about 70% children gained weight, 2.3% shifted to normal category. Because of other health reasons, 28% children did not indicate any positive improvement.

**Rural Hoshangbad Block:** Before intervention of our programme, 1206 children were in grade–II malnourished and 100 were severely malnourished in the block. After consumption of soy based food products, 77.6 % children gained weight and shifted to the grade-I malnutrition status. Out of 100 severely malnourished children, 16 children recovered, 8.5% shifted to grade –I malnutrition status, 1.32% shifted to normal category. There are 162 Aanganwadis in the block, adopted by 60 Atal Bal Palaks to improve the nutritional status of malnourished children.

The supplementation of soy based food improved the nutritional status of the beneficiaries. Further SHG members of the block preparing soy foods and selling to the Atal Bal Palaks, generated additional income and employment in the rural area.

## TECHNOLOGY TRANSFER

### Externally Funded Projects approved

During the quarter, the Institute received approval for executing the following externally funded projects:

- *Network Project on Engineering Interventions in MIS for enhanced water productivity*, funded by ICAR under CRP. The budget sanctioned for CIAE is Rs. 67 lakhs. Dr KVR Rao, Principal Scientist is the Principal Investigator of the project.
- *Mainstreaming gender and empowerment through women friendly farm Mechanization package in tribal areas of Tamil Nadu*, funded by Department of Science and technology, New Delhi. The total budget of the project is Rs.34.80 lakhs. Dr R Senthil Kumar, Scientist, CIAE Regional Centre, Coimbatore is the Principal Investigator of the project.

### Training Organized

#### Training on Manufacturing of Agricultural Machinery

Training on Manufacturing of Agricultural Machinery was organized during 28-29 June, 2018 for the beneficiaries of Chief Minister Youth Entrepreneurs Scheme (CMYES), implemented through MSME, Directorate of Industries, Govt. of MP and the UNDP. The training was organized through a balanced mix of identifying specific needs of the participants, interactive sessions on recent advances in manufacturing of agricultural machinery, visit to Institute's CAD Cell and Prototype Production Centre, display/ demonstration of selected agricultural machinery, interaction with state policy makers and planning



action. The objective of the programme was to sensitize the agricultural machinery manufacturers on modern practices of manufacturing, new agricultural machinery/ technologies and their market potential, standardization and quality control assurance in agricultural machinery manufacturing, technical support services and liaisoning opportunities for manufacturers with ICAR-CIAE for effective promotion of agricultural mechanization in India.

#### Other Training

Training	Duration	No. of participants
Entrepreneurship development training programmes on preparation of soymilk and tofu for upcoming entrepreneurs	16-21 April, 2018	3
	16-23 June, 2018	2
Application of agricultural engineering technologies for trainees nominated by MANAGE, Hyderabad and coordinated by CEDMAP, Bhopal	31 May, 2018	21
Application of agricultural engineering technologies for trainees nominated by MANAGE, Hyderabad and coordinated by Indo-European Chamber of Commerce and Industry	1 June, 2018	35
CAD training (Pro/ Engineer; Creo/ Element) for B.Tech. (Agril. Engg.) students from SHUAT&S, Allahabad; CAE, ANGRAU, Madakasira and CTE, MPUAT, Udaipur	1-30 June, 2018	6
Practical training for UG/ PG students	April-June, 2018	91



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### Patent application filed

E-filing of patent application was filed at Patent Office, Mumbai for the technology entitled Singulation and pickup mechanism for bare root seedlings of onion, cuttings and the like on 19 June, 2018.

### Manufacturers Meet organized

Manufacturers meet was organized on 7 April, 2018 in collaboration with MP Directorate of Agricultural Engineering. About 200 participants (manufacturers State Government agricultural engineers) participated.



### MGMG Programme

Under Mera Gaon Mera Gaurav programme, the following activities were undertaken during the quarter:

Activities	No.	Total Beneficiaries
1 No. of Villages covered	40	1762
2 No. of Visits made	28	
3 No. of Demonstrations	15	
4 No. of farmers' meeting	25	

Under Gram Swaraj Abhiyan – Kisan Kalyan Diwas on 2 May 2018, farmers of Chandpur and Borkhedi villages were advised on use of appropriate machinery for soybean and paddy cultivation in forthcoming kharif season and also demonstrated the use of CIAE hexagonal manual maize sheller and manually operated vegetable transplanter for plug-type seedlings.



Regional Centre, Coimbatore organized demonstration of seed cum fertilizer drill for groundnut sowing at Vazuku parai village on 11 May, 2018.



### Commercial testing of agricultural machinery

During the quarter, test reports of 29 commercial agricultural machinery were released, generating revenue of Rs.25.91 lakhs.

## KVK NEWS

KVK of the Institute organized following training, participated by 378 farmers:

- Mechanized paddy production technology (in association with DDA, Narayanpur C.G through Samaj Kalyan Jan Seva Samiti Bhopal)
- Kharif crops production and farm machinery (for farmers of Maharashtra)
- Water conservation technology for crop production (organized at village Manikhedi, Berasia in association with PD, ATMA & DDA Bhopal)
- Sapling plantation (in association with Forest Department, Bhopal)
- सोयाबीन जागरूकता कार्यक्रम, ग्राम सागोनिया (फंदा), भोपाल
- जल संरक्षण की उन्नत तकनीक एवं केचुओ के द्वारा फसल पोषण हेतु जैविक खाद बनाना, ग्राम सागोनिया (फंदा), भोपाल

## TECHNOLOGY TRANSFER

### Demonstration of technologies at Farmers Field

Following technologies were demonstrated at farmers field:

Technology Demonstrated	No. of demonstration	Area covered, ha	Villages
Deep ploughing	05	2.0	Sagoniya, Barkhedhi Abdulla, Daulatpur Thikariya, Lambakheda, Binapur Pipaliya baz kha, Kolukhedhi
Inclined plate planter for maize seed sowing	01	4.0	
Pedal cum power operated grain cleaner	25	12	
Groundnut decorticator	35	15q	
Fertilizer broadcaster	01	8.0	



The Scientific Advisory Committee Meeting of KVK for Kharif-2018 was organized on 6 June, 2018 in which Joint Director Extension, RVSKVV, Gwalior participated, besides the officials from the Institute, IISS, line departments and progressive farmers of Bhopal district, to finalize the activities of KVK for Kharif-2018.



programme for women, sapling trees for rainwater harvesting, etc. About 5700 farmers were benefitted from these sanghoshtis.



### Kisan Sanghoshti

During the quarter, KVK organized six Kisan Sanghoshtis in different villages of Bhopal district. In these sanghoshtis farmers were given information on improved farm machinery and kharif crops production, nutrition awareness

## TECHNOLOGY TRANSFER

### Kishan mobile advisory /through farmers' portal, advisory and diagnostic

Sl. No.	Discipline	No. of Scientists visited at farmers	Advisory services		
			KMA	No. of Advisories	Diagnostic services at farmers field
1.	Agronomy	11	13	130	11
2.	Engineering	05	03	50	04
3.	Horticultural	04	08	40	02
4.	Home science	01	07	15	-
<b>Total</b>		<b>21</b>	<b>31</b>	<b>235</b>	<b>17</b>

### Farmers Visits

About 450 farmers from the states like Madhya Pradesh, Rajasthan and Maharashtra visited the KVK of the Institute. They were exposed to improved tools and equipment used for mechanized cultivation of crop and in proved practices on agriculture.



### TV Programmes

Topic	TV Channel	Date	Presenter
Water conservation techniques, structures and its maintenance	ETV M.P/ C.G	11 May, 2018	RD Soni
Water, weeds, nutrients and pest management in merry gold flower cultivation	ETV M.P/ C.G	11 May, 2018	RD Soni
Shadenet house technology for vegetable cultivation	DD, MP	12 June, 2018	KV Ramana Rao
<i>Kharif phasalon me samayik krishi karya</i>	DD, MP	11 June, 2018	RD Soni
Raised bed planting of crops	New 18 ETV	13 June, 2018	UR Badegaonkar
<i>Kharif phasolon ki boni hetu yantrikaran</i>	DD, MP	18 June, 2018	UR Badegaonkar

### Radio Talks

Topic	Broadcaster	Date	Presenter
<i>Jal sanchayan evam sinchai prabandhan mein sanrakshit kheti ka yogdaan</i>	AIR, Bhopal	10 April, 2018	DK Dwivedi
Advanced farming machines for sowing of kharif crops	AIR, Bhopal	3 June, 2018	UR Badegaonkar
<i>Kheti me sourya urja ke upyog</i>	AIR, Bhopal	16 June, 2018	RK Tiwari
<i>Dhan ke bhuse ka yantrikat prabandhan</i>	AIR, Bhopal	16 June, 2018	RK Tiwari

## TECHNOLOGY TRANSFER/ REPORT

### Participation in exhibitions

CIAE technologies were exhibited in following exhibitions:

- Exhibition on Solar Energy Gadgets, organized at Vigyan Bhawan, New Delhi during 1-5 June, 2018
- Nutrition Sensitive Agriculture and Nutrition Literacy organized by Govt of M.P, ICAR-ATARI, UNISEF M.P etc. at Bhopal during 14-16, May 2018



### Awards and Recognitions



Dr. SK Giri, Principal Scientist has been elected as Fellow (FIE) of The Institution of Engineers (India).

### Ph.D. Awarded



Er. Sandip Mandal, Scientist has been awarded Ph.D. by GBPUA&T, Pantnagar on 8 June, 2018 for his Ph.D. thesis entitled 'Optimization of Process Parameters for the Conversion of Pine Needles to Bio-oil, Bio-char and Product gas through Batch and Continuous Pyrolysis'. He did his Ph.D. under the guidance of Prof. T K Bhattacharya, Prof & Head Department of Farm Machinery and Power Engineering, College of Technology, GBPUA&T, Pantnagar.



Er PP Ambalkar, Senior Technical Officer has been award Ph.D. by Sam Higginbottom University of Agriculture, Technology & Sciences (Formerly Allahabad Agricultural Institute) Allahabad on 16 April,

2018 for his Ph.D. thesis entitled 'Modification and Testing of Pelletizing Machine for Aqua Feed Pellets with Enhanced Floatability and Water Stability'. He did his Ph.D. under the guidance of Dr. Suvrat Kumar Singh, Professor and HoD, DFPE, VIAET, Allahabad and co-guidance of Dr PC Bargale, Head, Technology Transfer Division, ICAR-CIAE, Bhopal.

### Foreign Deputations

Dr Ravindra Naik, Principal Scientist participated in the "Regional Workshop on the Role of Mechanization in Strengthening Smallholders' Resilience through Conservation Agriculture in Asia and the Pacific" in Phnom penh, Cambodia during 18-20 April, 2018. The programme was organized by the Centre for Sustainable Agricultural Mechanization (CSAM) of the Economic and Social Commission for Asia and the Pacific (ESCAP) in collaboration with the Ministry of Agriculture Forestry and Fisheries of the Kingdom of Cambodia. Engineers from 14 countries and 5 international organizations in the Asia-Pacific region participated in the programme.



Dr CR Mehta, Project Coordinator, AICRP on Farm Implements and Machinery (FIM) participated in the 4<sup>th</sup> meeting of the Technical Working Groups of the Asian and Pacific Network for Testing of Agricultural Machinery (ANTAM), which took place in Georgetown (Malaysia) from 25-28 June 2018. He was elected as Chair of Technical Working Group on Power Tillers for 2018.



## REPORT/ PUBLICATIONS

### Human Resource Development

Name & Designation	Training attended	Duration	Place
DK Jain CTO	Creo Parametric (Pro/E)	14-25 May, 2018	ATI, Mumbai
Naresh Pakhale STO			
Ashish Sahu Assistant	Organization Specific Programme for directly recruited Assistants of the Council.	11 June to 6 July, 2018	New Delhi
A. Natratzan Assistant			

### Professional Attachment Training

The following Scientists of 107<sup>th</sup> FOCARS batch underwent three-months professional attachment training at the Institute during 16 April to 13 July, 2018



Er. Ajita Gupta did her professional attachment training on the topic 'Water productivity and yield of baby corn (*Zea mays L.*) as influenced by irrigation levels under subsurface drip irrigation'. She has been posted at ICAR- Indian Grassland and Fodder Research Institute, Jhansi.



Er. Shekh Mukhtar Mansuri did his professional attachment training on the topic 'Development of graphical user interface (GUI) for three dimensional measurements of seeds and grains using Image processing'. He has been posted at ICAR-Central Arid Zone Research Institute, Jodhpur, Rajasthan



Er. Bholuram Gurjar did his professional attachment training on the topic 'Performance evaluation of tractor operated straw loader'. He has been posted at ICAR- Indian Grassland and Fodder Research Institute, Jhansi.

### Research Papers

Ansari MF, Giri SK and Baboo B. 2018. Assessing the properties of lac mixed with salt during storage. *The Indian Forester*, 144 (3) : 280-285.

Chandel AK, Tewari VK, Kumar SP, Nare B and Agarwal A. 2018. On-the-go position sensing and

controller predicated contact-type weed eradicator. *Current Science*, 114 (7) : 1485-1494.

Chauhan SK, Tiwari RK, Yuumnam J. and Din M. 2017. Energy consumption for ginger production under traditional cultivation system in Sikkim. *Journal of Bioresources*, 4 (3) : 36-38.

## PUBLICATIONS

Mandal S, Kumar Arbind, Mehta CR and Singh RK. 2018. Power tiller operated zero-till planter for pea planting in rice fallow of North East India. *Agricultural Mechanization in Asia, Africa and Latin America*, 49(1) : 79-84.

Mehta CR, Gite LP and Khadatkar A. (2018). Women empowerment through agricultural mechanization in India. *Current Science*, 114(9) : 1934-40.

Pandirwar AP, Kumar A, Mishra IM, Gaikwad BB, Sawant CP, Bhowmik A. 2018. Soil bin studies on plug and finger-type onion seedling transplanting mechanisms. *Journal of Agricultural Engineering*, 55 (1) : 1-14.

Rajwade YA, Swain DK and Tiwari KN. 2018. Grain yield, water productivity, and soil nitrogen dynamics in drip irrigated rice under varying nitrogen rates. *Agronomy Journal*, 110(3) : 868-878.

Rao KV Ramana, Gumasta Vivek, Saxena CK, Patel GP and Bhushana Babu V. 2018. Performance of tomato (*Solanum lycopersicum* L.) under drip irrigation with peripheral insect proof net. *Agricultural Engineering Today*, 42(1) : 1-5.

Singh R. and Giri SK. 2018. Active modified atmospheric packaging of mango (cv. Dushari): An experiment with potassium permanganate and salicylic acid. *International Journal of Current Microbiology and Applied Sciences*, 7(3) : 2790-2796.

Tiwari RK, Chauhan SK, Din M and Yumnam J. 2018. Improved potato diggers in terrace condition of Sikkim in India. *International Journal of Agriculture Research*, 10(11) : 6211-6214.

Tiwari RK, Chauhan SK, Din M, Rautaray SK and Chaudhuri D. 2018. Development and evaluation of improved saddle of yak for enhancement of packload capacity on steep slopes in hills – A case study in NER. *Indian Journal of Hill Farming*, 31(1) : 85-89.

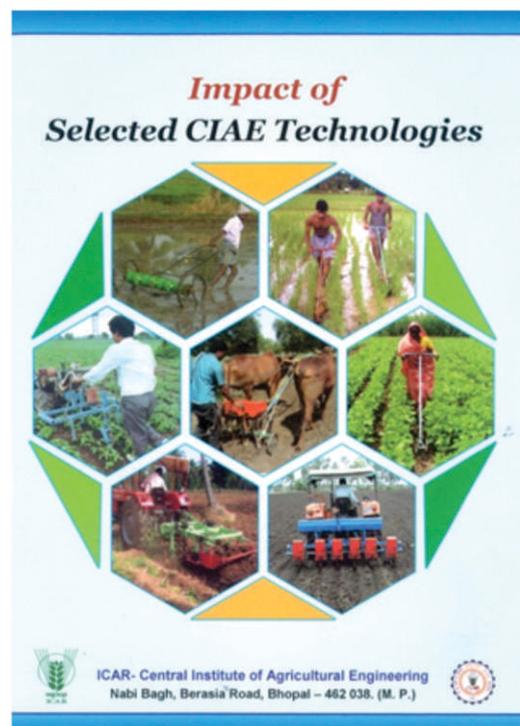
Tiwari, RK and Chauhan SK. 2018. Effect of round spiked threshing cylinder geometry on the threshing performance of wheat crop. *Indian Journal of Hill Farming*, 31(1) : 63-69.

Waghaye AM, Saxena CK, Kumar S, Pathan A and Abhishek R. 2018. Multiple linear modelling of electrical conductivity at a subsurface drainage site in Haryana using EM technique. *International Journal of Chemical Studies*, 6(2) : 1953-1960.

Waghaye AM, Rajwade YA, Randhe RD and Kumari N. 2018. Trend analysis and change point detection of rainfall for Andhra Pradesh and Telangana, India. *Journal of Agrometeorology*, 20 (2) : 160-163.

Yadav A, Mangaraj S, Singh R, Dash SK, Kumar N and Arora S. 2018. Biopolymers as packaging material in food and allied industry. *International Journal of Chemical Studies*, 6 (2) : 2411-2418.

### Technical Bulletins



Singh RS and Agrawal KN. Impact of Selected CIAE Technologies. Technical Bulletin No. CIAE/AMD/250.

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Singh RC and Jena PC. 2018. सौर पी. वी. प्रशिक्षण मेनुअल: व्यवहारिक सौर प्रधौगिकी के उपयोग, मरम्मत एवं रखरखाव के लिए उपयुक्त. Technical Bulletin No. CIAE/AEP/2018/215

### Popular Articles

Tiwari RK and Yumnam Jekender. 2018. Scope for adoption of improved equipment for root crops in north eastern region. *Sikkim Express, Gangtok*, June 17: p 5.

Chandel AK, Tewari VK, Kumar SP, Nare B, Agarwal A. 2018. Smart device developed for precise use of herbicides. India Science Wire, Latest S&T News from India. [http://vigyanprasar.gov.in/isw/use\\_of\\_herbicides\\_story.html](http://vigyanprasar.gov.in/isw/use_of_herbicides_story.html)

Waghaye A., Rajwade Y., Randhe R., and Kumar M. 2018. *Varsha jalsanchay – bhavishya ki aavashyakta. Kirshak Doot*, 8-14 May : p8.  
Rajwade Y., Waghaye A., Rao KVR and Randhe R. 2018. *Sinchai ke liye ek sthaniya vikalp. Kirshak Jagat*, 28 May : p6.

Singh SP, Bharti SK, Sainy N. and Badegaonkar UR. 2018. *Sahajan (moonga) dwara uttam poshan. Krishak Doot*, 17-23 April : p12-13.

### Brainstorming Session cum Launching Workshop

A Network Project on "Engineering Interventions in Micro Irrigation Systems (MIS) for improving water productivity" has been recently approved by the Indian Council of Agricultural Research with ICAR-CIAE as a lead centre under CRP on FM&PF. Other centres include IIT, Kharagpur; CAE&RC, Coimbatore; CAU, Gangtok and PAU, Ludhiana. A Brainstorming session cum

launching workshop of the project was held on 10 April, 2018. The Guest(s) of Honour of the meeting was Dr.TBS Rajput, Emeritus Scientist, ICAR-IARI, New Delhi and Dr. RK Singh, Project Coordinator, AICRP on PET, Ludhiana. The meeting was Chaired by Dr. KK Singh, Director, ICAR-CIAE and was attended by Principal Investigators of Bhopal, Ludhiana, Coimbatore and Gangtok centres along with the Scientists of Irrigation and Drainage Engineering Division of CIAE.

### Expert Group Meeting on Energy Management in Agriculture

An Expert Group Meeting on Energy Management in Agriculture (component of the ICAR-AICRP on EAAI) was organized during 2-3 May, 2018 at Agricultural Engineering College & Research Institute, TNAU, Coimbatore. Dr. K. Alagusundaram, honourable Deputy Director General (Engg.) of ICAR, New Delhi chaired the meeting. The experts cum subject matter specialists present on the occasion included Prof. B. S. Pathak, Ex-Director, SPRERI, VV Nagar; Dr. S. Kamaraj, Ex-Prof. and Head, Department of Bio-energy, TNAU, Coimbatore; Dr. T. K. Battacharya, Prof. & Head, PCT, GB Pant University of Agriculture and Technology, Pant Nagar and Dr. Hukum Chandra, National Fellow and Principal Scientist, ICAR-IASRI, New Delhi. In addition to above, Dr. C. R. Mehta, PC (FIM), CIAE, Bhopal also actively participated and contributed in the meeting. Dr. K. C. Pandey, Project Coordinator (ICAR-AICRP on EAAI) informed the group that the Energy Management in Agriculture (EMA) component was added in the ICAR-AICRP on Energy in Agriculture & Agro-based Industries (EAAI) since approval of 12<sup>th</sup> five



## REPORT

year plan. The main objective of the component was to increase efficiency of prevalent energy sources being utilized and to reduce the energy intensity in agro-industrial sector.

### Meeting with Tractor Manufacturers Association

A joint meeting of Senior Officers of Tractor Manufacturers Association and ICAR-CIAE, Bhopal was held on 21 May, 2018 to discuss various issues related with Indian Standards on tractors. The meeting was chaired by Dr KK Singh, Director, CIAE. Representatives from TAFE, Sonalika Tractors, Mahindra and Mahindra, Duetz-FHR also participated in the meeting. Various anomalies related to Indian Standards such as IS: 12207 (Forth Revision) and IS: 5994 were discussed in detail and it was decided that the points may be brought out to the knowledge of BIS authorities during the forthcoming meetings of FAD 11. Various newly developed CIAE technologies were demonstrated to the team of officers from different tractor manufacturing companies. Moreover, industry-academia collaboration on various research problems and association of industry in critical components development were also discussed.



### IRC Meeting

Institute organized its 101<sup>st</sup> IRC meeting during 22-23 and 25-26 May, 2018. Following projects were approved during the meeting:

- Development of manual tools for chemical swabbing, tying, suckering and bark removing operations in grape cultivation
- Development of tractor drawn five row weeder for onion
- Determination of water stress indices using spectral reflectance and thermal imaging in field crops.

- Development of real time automatic plot irrigator
- Development and testing of surface and subsurface drip lateral retrieval systems
- Mechanization of baby corn processing
- Post-harvest management of tobacco leaves
- Development of pigeon pea transplanter



### Hon'ble PM's Webcast Programme



Hon'ble Prime Minister of India addressed farmers of the nation and interacted with them through video conferencing at all Krishi Vigyan Kendras on 20th June, 2018.

The Institute made arrangements to watch the live webcast of this programme. Approximately 350 people comprising of farmers, scientists, and staff members of the Institute watched this programme.

The webcast was followed by a training programme for the farmers of adopted villages under *Mera Gaon Mera Gaurav* scheme wherein the farmers were provided tips on improved crop production techniques for *kharif* crops.

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### Hon'ble Minister of Agriculture visits CIAE

Shri Radha Mohan Singh, Hon'ble Minister of Agriculture and Farmers' Welfare, Govt. of India and President, ICAR visited the Institute on 18 May, 2018. He conducted two meetings with official of Madhya Pradesh State Government including Agricultural Production Commissioner, Principal Secretary - Agriculture and Farmers' Welfare, and Animal Husbandry, Managing Directors of Agricultural Marketing Board, Seed certification, Seed corporation, Milk corporation, Cooperative marketing. Directors of Agriculture and Farmers' Welfare, Agricultural Engineering, Agricultural Extension and Animal husbandry. Director Extension services from JNKVV, Jabalpur & RKVV, Gwalior. Also present in the meeting were Directors of all ICAR Institutes based in MP, representatives of KVKs, senior officials from ICAR-CIAE, ICAR-IISS, and ICAR-NIHSAD.



During this meeting Hon'ble Minister reviewed physical as well as financial progress of various developmental schemes of Government of India viz. National Food Security Mission, Gokul Gram, RKVY, Integrated Farming, Rainfed Area Development and ENAM.



Hon'ble Agricultural Minister also conducted a meeting with scientists and staff of ICAR-CIAE, ICAR-IISS and ICAR-NIHSAD, Bhopal to take stock of their progress and contribution towards Indian agriculture, specifically in the field of agricultural mechanization. Dr. KK Singh, Director, ICAR-CIAE made a presentation on various technologies and achievements of the Institute showcasing an impact of about Rs. 4,500 crores per year on the Indian agriculture due to use of technologies developed by ICAR-CIAE, Bhopal.



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### World Honey Bee Day

The Institute participated in the World Honey Bee Day, organized by M.P. Khadi & Village Industries Board and Khadi and Village Industries Commission (Ministry of Micro, Small and Medium Enterprises, Govt. of India) at Jawahar Bal Bhavan, Bhopal on 20 May, 2018. Honourable Member of Parliament, Shri Alok Sanjar was the chief guest on the occasion. Awareness programme about honey bee and its benefit on human health was apprised to the participants (mostly school going children).



### International Yoga Day celebrated

International yoga day was celebrated at the Institute on 21 June, 2018. The programme was organized in the TTD display hall of the institute. The staff along with Director of Institute Dr. KK Singh was present on the occasion. Yoga expert from Bhartiya Yog Sansthan were invited to throw light on the importance of yoga in our daily life. Yoga experts were welcomed by the programme Director CIAE. Ms. Reeta Chaudhury Regional Head, Shahpura region, Bhopal along with other yoga experts Ms. Shail Sharma, Ms.



Arti Jain and Ms. Anita Verma briefed about the importance of Yoga in our daily life. Different Pranaayam and Asana like Grewa chalan, Ghutna challan, Skandh challan, Ardachakrasan, Tadaasan, Surya namaskar, shavaasan and Dhyana mudra were demonstrated to CIAE staff. The staff along with Director of Institute Dr. K K Singh practiced above demonstrated Pranaayam and Asanas. Yoga expert also elaborated some exercises that can be done in our working place to increase working efficiency and break monotony of the work.

### Meeting of AFST(I)-Bhopal Chapter

A meeting of AFST(I)-Bhopal Chapter was held on 30 June, 2018. It was attended by Members of the Society, scientists, and professionals from industry, academic institutes, students etc. All participants were welcomed by president of the chapter Dr. Nachiket Kotwaliwale. In his address, Patron of the chapter Dr. KK Singh emphasized for conducting at least one meeting/programme in every quarter so that chapter gets better visibility and members are benefitted by sharing of knowledge. He urged students to be more active in the society activities. Dr. Nawab Ali, past president of the AFST(I), Bhopal chapter commented that food processing at production catchment could result into reverse migration of population, i.e. from urban to rural areas. On this occasion, Dr. SD Deshpande made a very informative presentation on Food Safety Standards and Regulatory framework in India. A General Body Meeting was also held. The meeting ended with vote of thanks by the Secretary Dr. Punit Chandra.



## REPORT

### Distinguished Visitors

Forty trainees of Indian Army, Indian Navy and Indian Air Force from visited from Institution of Cooperative Management, Bhopal visited on 26 April, 2018 and took keen interest in Institute technologies for future establishment of agri-business ventures.



Dr MM Pandey, former DDG (Engg), ICAR visited the Institute on 11 May, 2018.

Shri Jeevan Mohanty, Consultant, National Fund for Agriculture Development (IFAD) visited the Institute during 31 May to 2 June, 2018. During this visit he listed the technologies suitable for inclusion in IFAD programmes being implemented in 13 States of the Country. He also interacted with manufacturers who have taken licence from ICAR-CIAE to assess potential of supply of prototypes for IFAD selected States. He also visited a few local manufacturers to see their manufacturing facilities and quality of agricultural machinery being manufactured and marketed by them.



A team of senior officers from Eicher Tractors, Bhopal under the leadership of Shri Rohit Sachan, Associate Vice President – Service & Training a Unit of TAFE Motors Ltd. visited on 22 June, 2018 to see CIAE technologies. A discussion was held for possible collaboration between Eicher Tractor and ICAR-CIAE. A few areas of possible collaboration were also explored.

Shri Laxman Singh, Hon'ble Former Member of Parliament visited CIAE on 25 June, 2018 to see CIAE technologies. He also had a meeting with the Director, CIAE in which the issues related to agricultural mechanization were discussed. Shri Laxman Singh desired that a demonstration of CIAE soy paneer plant and portable briquetting plant for production of briquettes using agro based crop residues may be demonstrated at Raghogadh for the benefit of self-help groups for promotion and adoption of these technologies.



Shri Rajeev Choudhary, Director, Agricultural Engineering, Govt. of M.P. visited the Institute on 29 June, 2018 and was shown the recently developed technologies. Based on this, he suggested that CIAE may submit a proposal for inclusion of some of the CIAE technologies in subsidy programmes sponsored by Govt. of Madhya Pradesh and Govt. of India so that good technologies could reach to the farmers who help them in increasing the productivity & profitability in agriculture.

## PERSONNEL NEWS

### Staff Promoted



**Shri SN More**  
 Senior Technical Officer  
 wef 3 October, 2017



**Shri AK Sainy**  
 Technical Officer  
 wef 20 January, 2017



**Shri MS Thakur**  
 Senior Technical Assistant  
 wef 22 October, 2017



**Shri HG Menon**  
 Private Secretary  
 wef 17 May, 2018



**Shri Dilip Kumar Barthare**  
 Personal Assistant  
 wef 30 May, 2018

### Staff Superannuated

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



**Shri KG Rathi**  
 Asstt. Administrative Officer  
 30 April, 2018



**Shri GP Waghmare**  
 UDC  
 30 April, 2018



**Shri MK Malviya**  
 Assistant  
 31 May, 2018

## PERSONNEL NEWS

### Staff Superannuated



**Shri MPS Chouhan**  
 Asstt. Chief Technical Officer  
 30 June, 2018



**Shri Vijay Vishwakarma**  
 Technical Officer  
 30 June, 2018



**Shri AK Mishra**  
 Technical Officer  
 30 June, 2018



**Shri MR Lakra**  
 Technical Officer  
 30 June, 2018



**Shri AP Ekka**  
 Assistant  
 30 June, 2018



**Shri Jagdish Dhurve**  
 Assistant  
 30 June, 2018

### OBITUARY



Shri SM Joshi, UDC left for heavenly abode on 23 June, 2018.

**Chief Editor:** Dr Dipika Agrahar-Murugkar, Incharge-PME  
**Editor:** Dr Debabandya Mohapatra, Senior Scientist  
**Editorial Assistance:** K. Shankar  
**Photography:** M/s SS Bagde and Kalyan Singh

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