

## **CIAE showcases recently developed technologies in National Mega Meet on Technology Commercialization**

Agriculture contributes to only about 17.5% of GDP though it employs 57% workforce and sustains approx over 70% of the population. However due to low profitability of Indian agriculture farmers given the option want to leave this profession. One of the reasons for low productivity is very low level of mechanization in all aspects of agriculture e.g. production, post harvest management, under utilization of biomass and animal waste as energy source for rural energy and power, no proper water harvesting and its efficient use for irrigation etc. The Central Institute of Agricultural Engineering a nodal institute under ICAR has developed many technologies to increase the level of mechanization which will reduce the drudgery in conventional operations without displacing the labour.

The CIAE Bhopal showcased the recently developed agricultural engineering technologies in mega Meet on technology commercialization held at NAARM Hyderabad during Sept 29-Oct 1, 2011. The technologies included tractor operated onion harvester, self-propelled intra canopy sprayer, software for developing water harvesting ponds, technology for soy-butter, hand operated and a power operated aloe-Vera gel extractor with a unique design to extract only sweet gel. The CIAE technologies were highly appreciated by all and industry showed keen interest for their commercialization. The brief information on the technologies is as follows:

**1. Tractor operated onion harvester:** The machine harvests eight rows of onion raised on broad bed 1200 mm bed. It uproots the bulb with stalk and delivers to bulb and soil separating unit equipped with set of rollers to deliver the dug bulbs through delivery chute to stack them on the bed for sun curing, both the bulb and soil separation unit and wind rowing units are powered by pto of the tractor through horizontally mounted gear box. On digging the bulbs wind rowing assembly guides the crop to the soil and bulb separation unit. The Effective field capacity of the machine is 0.25-0.30 ha/h, Labor requirement, 100-175 man h/ha with Field efficiency of 88 %. The damage was less than 1%.

**2. Self-propelled intra canopy sprayer :** The unique features of this technology are  
1) It is a self-propelled high clearance sleeve boom intra canopy sprayer with 30 hp engine.  
2) The canopy spraying system consisted of 30 hollow cone nozzles having discharge of 250 ml/min with 80° angle of



spray. 3) Nozzle are arranged such that manner that one nozzle can spray the chemical on the top side of the plant and two nozzles spray the chemical in the middle part of the plant in opposite direction while remaining two nozzles have been provided in the lower part of the vertical boom at an angle of 45° for lower part of the canopy and back side of the leaves of the plants. 4) The machine can be operated in the field at the forward speed of 1.5 to 3.5 km/h. Cost of the machine is approx Rs. 6.00 Lakh.

**3. Software for water harvesting pond design:** The increasing worldwide shortages of water and costs of irrigation are leading to an emphasis on creation of additional water storage through rain water harvesting and its recycling for enhancing crop production. The cases of failure of water harvesting structures in watersheds due to faulty designs are rapidly increasing. Therefore software has been developed considering local conditions, which will arrive at proper design of water harvesting ponds and associated structures.

**4. Soy butter:** Unique features of this technology are 1) High protein butter like spread like pea nut butter 2) Soybean 40% protein and 18% oil 3) Shelf life 45 days under ambient 4) With kitchen appliances 2 kg soybean can be processed yielding 1.6 kg of soy butter and which can be sold at Rs 200/kg and at this rate profit will be 70% and ROI will be 133%



**5. Heat Pump Dryer for High Value Products:**

The unique features of this technology are 1) Micro-processor based temperature controller to regulates the drying temperature. 2) Minimises the loss of vitamins and essential oil of the products and save energy in drying. 3) For blanched Amla drying, the dryer reduced vitamin-C loss up to 87% as compared to the open sun drying. 4) The products such as sliced fruits and vegetables is dried in 20-25 h and medicinal herbs and leaf crops are 12-20 h. 5) The cost of the research prototype is Rs. 1,20,000 and capacity is 30 kg/batch.



**6. Aloe Vera gel extractor:**The unique features of this technology are 1) Only Aloe Vera gel is extracted from the central part leaving the bitter portion with the peels at both sides. 2) An inner clear gel that contains 99% water and rest made of glucomannans, amino acids, lipids, sterols, vitamins etc. 3) The equipment capacity 200-225kg gel/h (900-1000 leaves/h) for motorised and 100kg gel/h (400-450 leaves/h) for manual machine. 4) The extracted gel is clean and without any physical damage.



Many business organizations attended the meet to see latest technologies for commercialization e.g. ITC,TATA Chemicals, Digital Green, Agrichem,Bigtec Solutions, Niruthi, C-DAC,AJ Organica Honey Bee AP, Gyantech Information Systems, Grass Root Innovators and ICAR Institutes such as CIPHET Ludhiana, CIRG Mathura, NIAM, Baramati, CIRCOT,Mumbai and ICRISAT,Hyderabad and National Innovation Foundation, Ahmedabad.