GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

LOK SABHA
UNSTARRED QUESTION NO. 5250
TO BE ANSWERED ON 27/03/2018

LATEST FARM TECHNOLOGY

5250. SHRI BHARATHI MOHAN R.K.:
SHRI PR. SENTHIL NATHAN:
SHRIMATI V. SATHYA BAMA:
SHRI RAMSINH RATHWA:

Will the Minister of AGRICULTURE AND FARMERS WELFARE कृषि और किसान कल्याण मंत्री be pleased to state:

(a) the details of modern/latest farm technologies made available to farmers to assist them in the cultivation of crops in the country;

(b) whether the Government has identified the areas using obsolete technology in agriculture in the country and if so, the steps taken by the Government to introduce/make available the latest technological tools/methods to reach those areas/farmers community especially small and micro farmers;

(c) whether the Government provides subsidy/cash subsidy and adequate support to farmers for purchasing different farm machineries, seeds, fertilizers and electricity etc.;

(d) if so, the details thereof during each of the last three years and the current year, State-wise and component-wise; and

(e) the details of research and development work undertaken for development of agro-machineries to overcome the shortage of farm labourers in agriculture sector?

A N S W E R

MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE AND FARMERS WELFARE
कृषि और किसान कल्याण मंत्रालय में राज्य मंत्री
(SHRI PARSHOTTAM RUPALA)

(a) The details of modern/ latest farm technologies that are available to farmers to assist them in the cultivation of crops are given in **Annexure-I**.

(b) Yes, harvesting, transport, storage etc. operations are being carried out mostly by traditional methods. Research projects on harvesting equipment, modern transport and storage technologies are being taken and demonstrated to small and marginal farmers. Some of them are listed in **Annexure-II**.

(c) & (d): Yes, Madam. Government is providing adequate support to farmers for purchase of farm machinery, seeds, fertilizers and electricity.

The year wise and state wise release of the subsidy during last three years and current year for promotion of agricultural mechanization under Sub-Mission on Agricultural Mechanization (SMAM) is given in **Annexure-III**. The release of fund to different states for village seed programme is given in **Annexure-IV**.

Department of fertilizers provide subsidy to the manufacturers/importers of fertilizers for providing fertilizers to the farmers at subsidized rates and not to the state governments. The details of the subsidy during last three years and current year is given in **Annexure-V**.

The electricity is a concurrent subject. Supply and distribution of electricity at an affordable rate to all the consumers including farmers in a States falls within the purview of the respective State Government. There is no provision to give free power to the farmers by the Union Government (details in **Annexure-VI**).

(e) Some of the machines developed to overcome the shortage of farm labourers in agriculture sector are listed below:

1. SRI Power weeder
2. Tractor operated turmeric planter
3. Tractor operated turmeric digger
4. Raisedbed planter
5. Axial flow rice thresher
6. Rice straw chopper cum spreader
7. Tractor operated fodder harvester cum chopper with loading arrangement
8. Pulverizing roller
9. Three row rotary weeder
10. Aeroblast sprayer
11. Plastic mulch laying machine
12. Tractor operated vegetable transplanter
13. Power operated sunflower thresher
14. Zero-till seed cum fertilizer drill
15. Jyoti-multi-crop planter
16. Vertical conveyor reapers
17. Sugarcane setts cutter planter
18. Power operated maize dehusker cum sheller
19. Tractor operated garlic planter
20. Tractor operated garlic harvester
21. Cleaning/ grading/ washing of food grains, fruits and vegetables
22. Decortication of maize/ groundnut
23. Animal drawn bakkhar
24. Tendua iron plough
25. OUAT MB plough

26. Biasi plough (Tifal)
27. Pant Hill Plough
28. Pant Damala
29. Pant Datala
30. Three Tyne ferti- hoe
31. Paddy puddler
32. Wedge plough
33. Wing plough
34. Rolling peg puddler
35. Three row seed drill
36. Integrated Small Scale Lac Processing Unit
37. Power Ribboner machine for jute and mesta
38. Raw jute grading system
39. Improved jute retting technology
40. Measuring instrument of jute fibre properties
41. Small Scale Lac Processing Unit
42. Modern fabric preparation systems
43. High value added textile/non-textile products from fibre-based agro-residues and their marketing
44. Pre-cleaner to remove trash from seed cotton
45. On-Board Pre-cleaner for Mechanically harvested Cotton
46. Briquettes and Pellets making machines from cotton stalk

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Annexure-I
[Part (a) of Lok Sabha USQ No. 5250 for 27/03/2018]

Details of modern/ latest farm technologies that are available to farmers to assist them in the cultivation of crops

Rotary assisted broad bed former-cum-seeder: A raised bed former-cum-seeder has been developed for seeding of soybean and wheat crops on raised beds. Provision has been made for attachment of rotavator for formation of fresh bed or sowing with reshaping of bed with bed shaper only. This machine makes the bed on top with width and height of 1200 and 200 mm, respectively. The field capacity of this machine for making fresh bed and sowing is 0.35 ha/h and for reshaping of bed and sowing is 0.56 ha/h. The farmers can get a benefit of about Rs. 15,000/ha. The technology has been licensed to M/S TAFE Ltd., Chennai in year 2014.

Self- propelled hydraulic multipurpose vehicle for orchard management: A hydraulically powered self-propelled multipurpose orchard management system has been developed for harvesting fruits, pruning and spraying operation in mango, sapota, citrus, etc. It employs a full hydraulic drive system with 360° steering, which effectively solves the steering problem typically encountered in the narrow spaces in orchard field. The prototype is built that can navigate smoothly through an undulated terrain. It is stable on slopes less than 8° and has good climbing ability. Lifting, lowering of the platform; forward, backward movement and steering of the machine are controlled by the operator from the platform. Attachments for cutting, pruning, spraying etc. operated by the machine hydraulic system itself are also developed. The equipment has been licensed to two manufacturers M/S Fine Fabrication, Bhopal and M/S TAFE Ltd., Chennai.

Millet Mill: CIAE Millet mill has been developed for dehusking minor millets viz., foxtail millet, little millet, kodo millet, proso millet and barnyard millet. This machine has a capacity of dehusking 100 kg/h (at 95% efficiency) and operates with 1 hp single phase electric motor. The technology has been licensed to M/S Perfura Technologies (India) Pvt. Lt., Coimbatore; M/s. AVM Engineering Industries, Salem and M/s. Valampuri Industries, Coimbatore and about 100 units has been manufactured and installed by these manufacturers.

Low pressure sugarcane sett/bud treatment unit: (Developed in collaboration with ICAR - Sugarcane Breeding Institute, Coimbatore, Tamil Nadu): A low pressure plant protection chemical treatment has been developed to address the problem of red rot and smut disease management in the sugarcane setts/ buds before planting. The equipment under reduced pressure of about 400 mm Hg would reduce the quantity of chemical being treated per ha. The scaled up model can be hitched to the tractor and transported to the sugarcane field, making it very convenient to use. Capacity of the commercial model is 20,000 sugarcane bud chips/2000 double sett buds. By using this equipment, the soaking time is reduced significantly by almost 90% and saving in chemical 80%, thus making the system environmentally friendly. The equipment has been commercialized and licensed to two manufacturers M/s Cleantek, Coimbatore and M/s PM Cons Engineering India Pvt Ltd, Bangalore. About 20 number of equipment has been supplied to different sugar mills in Tamil Nadu.

Two row tractor drawn mechanical planter for sugarcane bud chip settlings raised in portrays: The equipment consists of mainframe to be attached to standard three point hitch arrangement of a 40 hp tractor with adjustable arrangement for altering row to row spacing of 90, 120 and 150 cm. Bud chip settlings are dropped through the metering mechanism by two operators who are seated behind the equipment with adjustable arrangements for altering plant to plant spacing of 30, 45 and 60 cm. The field capacity of the equipment is 0.15 ha/h and the missing of 3 to 4% at a working speed of 1.4 km/h. The plant establishment was more than 95%. The yield and quality parameters are on par when compared with manual planting. The equipment has been commercialized and a MoA has been signed with M/s. Rohit Steel Works, Pune.

Moringa leaf stripper: The equipment is used to separate the Moringa leaflets from the harvested bunch of Moringa tree. The machine is powered by 2 hp single phase motor. The capacity of the machine is 300 kg/h. The stripping efficiency was found to be 98%. The percentage damage to the leaves was found to be negligible. The capacity of the machine is 300 kg/h. The farmers can save 93 % cost of operation and 90% labour over the traditional method of manual stripping. The equipment has been licensed to four manufacturers M/s Arunaas Agro Products, Theni; M/s Grenera Nutrients Pvt. Ltd., Erode; M/s Sankoh Process Equipment, Hosur, Krishnagiri and M/s. Coir All Equipment, Coimbatore, Tamil Nadu. They have supplied about 100 units to farmers.

Tractor operated check basin former: A tractor operated check basin former has been developed at MPKV, Rahuri. The machine scrapes, collects and distributes the collected soil uniformly to form side bunds and cross bunds at regular interval of 6 m in a single pass. The size of check basin formed is 2 x 6 m. The effective field capacity of the machine is 0.15 ha/h. The cost of operation of the tractor operated check basin former is Rs. 3075/ha. It gives 96% saving in time and 32% in cost of operation as compared to conventional manual method. M/s Bhansali Agricultural Implements Co., Kopargaon, District Ahmednagar, Maharashtra is engaged in its commercial production and sold 15 units so far. The firm is manufacturing tractor operated check basin former under the brand name of *Bahubali.* The annual benefit per unit is Rs 60,000/.

Tractor operated garlic planter: A tractor operated six row garlic planter has been developed at PAU, Ludhiana with actuating spoon (23 mm diameter and 2.5 mm depth size) type metering mechanism for planting of garlic at 150 mm row spacing. It consists of seed metering plate, seed hopper, agitator and seed covering device. The power to the metering mechanism is provided from the ground wheel with the help of chain and sprockets. The effective field capacity of the machine is 0.18-0.21 ha/h at a forward speed of 2.00 to 2.25 km/h. An average percentage of missing and multiples are 9.13 and 26.70%, respectively with the garlic planter. There is a saving of 82% in labour requirement and 57% in cost of operation as compared to manual planting. The equipment is jointly developed with M/s Dashmesh Mechanical Works, Amargarh. The annual benefits per unit are Rs 1.00 lakh.

Tractor drawn turmeric rhizome planter: A tractor drawn turmeric rhizome ridger planter has been designed and developed at TNAU, Coimbatore. It consists of 3 ridger bottoms and planting mechanism for planting on one side of the ridges in one pass. The planting mechanism includes rhizome hopper, cup feed seed metering mechanism, rhizome metering shaft, shoe type furrow opener and spike tooth ground wheel with chain sprocket drive for transmitting power from ground wheel to rhizome metering shaft. Three rows can be planted at a time at the required spacing. The effective field capacity of the implement is 0.15 ha/h. There are savings of 51%, 88% and 50% in cost of operation, labour and rhizome quantity, respectively as compared to traditional method of planting. The planter was released by Govt. of Tamil Nadu *and* TNAU Coimbatore for commercial adoption and use by farmers during 2015. Two manufacturers are currently manufacturing the planter. Three units have been supplied from AMRC to different Institutions. The annual benefits per unit is Rs 42,800/.

Tractor operated sugarcane seedling (settling) transplanter: The tractor operated semi-automatic sugarcane settling transplanter has been developed at MPKV, Rahuri for transplanting sugarcane settlings. It consists of main frame, two rotary drums, power transmission system, seedling tray, furrow openers, ground wheel, press wheels, seats for workers and depth control mechanism. The plant to plant and row to row spacing of the machine are 600 and 1500 mm, respectively. The working width and depth of the machine are 1500 and 148-150 mm, respectively. The average effective field capacity is 0.30 ha/h at forward speed of 2.5 km/h. The machine has been commercialized to M/s Balwant Shri Sai Food Processing Equipments Co., Kopergaon in Ahmednagar district and sold 15 units.

Tractor drawn planter cum boom sprayer for groundnut: A planter with four nozzles herbicide spraying attachment has been designed and developed at PJTSAU, Hyderabad for groundnut crop. The planter cum herbicide sprayer is suitable for simultaneous sowing and spraying of herbicide in groundnut crop. It consists of piston type pump, flat pattern nozzle on the boom, two drums of 220 l capacity each, seed box of 40 kg capacity and inclined plate metering mechanism for planting of seeds. The piston type pump receives the power from PTO shaft of tractor to pump the chemical from tank into nozzles through inlet and outlet pipes. The spraying attachment is fitted at the back of the planter which sprays the chemical uniformly after the furrow is closed by the covering blade. The effective working width of spraying is 2.40 m and the pump operating pressure ranges 200-500 kPa. The application rate of spraying unit is 492-612 l/ha. The effective field capacity of 8 row implement is 0.62 ha/h at forward speed of 2.5 km/h. Four manufacturers are engaged in commercial production and supplied 10 units. The annual benefit per unit is Rs 55400/ due to double unit operations in single pass.

Tractor operated cassava harvester: A tractor operated cassava harvester has been developed at TNAU, Coimbatore. It consists of main frame, shanks, digging blade, hitching frame and depth adjustment wheels. It is designed for both two rows and single row operation. The shank is designed as a bent leg plough with an angle of 150^{o} to accommodate the dug cassava tubers. The blade angle of 5^{o} is provided for easy penetration into the soil. The row spacing can be altered by moving the shanks in the main frame. The depth wheels are provided to adjust the depth of operation. The effective field capacity is 0.08 ha/h for single row and 0.17 ha/h for two rows machine. The undug tuber is 2.5% and damage to tubers is less than 1%. It saves 40% in cost as compared to manual harvesting. The average annual benefit per unit is Rs 20,000 and 30,000/ for single and 2 row units. M/s Greenfield Equipment India Private Ltd, Coimbatore has manufactured 7 units and sold to users.

Tractor drawn turmeric digger: A 33.6 kW tractor drawn turmeric digger of 1.45 m width has been developed at PJTSAU, Hyderabad. The penetration of blade of the digger into the soil is easy at blade rake angle of 55^{o}. The implement can dug four rows at 300-350 mm depth in single pass at 2.5 km/h tractor speed with an effective field capacity of 0.36 ha/h. The developed turmeric digger is working well for digging the turmeric rhizome lying 200-250 mm deep into soil, with negligible damage. The annual benefit per unit is Rs 120,000/. The equipment is commercialized to four manufacturers and supplied 100 units to farmers during last three years. The leading firm is M/s Godavari Valley, Hyderabad.

Tractor operated flail type fodder harvester-cum-chaffer for uniform size of cut: Tractor operated flail type forage harvester cum chopper and loader developed at PAU, Ludhiana has been further modified. The machine consisted of a rotary shaft mounted with flail blades for harvesting the crop, auger for conveying the cut crop and cutters for chopping and conveying chopped fodder through outlet into the trailer. Auger type conveying unit has been replaced with belt conveyer and positive feeding system. A chaffer head mechanism with spring loaded feed rolls has been provided at the chopper inlet to cut uniform size of fodder. The developed machine was evaluated with two fodder crops viz. maize and sorghum. The field capacity of the machine was 0.19 ha/h with width of cut of 1.2 m and fuel consumption was 6.0 l/h. Average size of cut of chopped fodder was 31 mm. There was saving of 26.98% in cost and 76.80% in labour over system of fodder chopping with tractor operated mower and chaffer cum loader. There is benefit of Rs 204,000 per annum per unit. Three manufacturers viz M/s Sherpur Agro Industries, Ludhiana, M/s Gurunanak Agril. Implements, Mansa, M/s Raj Works, Jalandhar, Punjab have manufactured more than 150 units.

Power operated sugarcane sett cutter: Power operated (0.75 kW, 1440 rpm, single phase electric motor) sugarcane sett cutter has been developed at MPKV, Rahuri. It has four numbers of cutting blades to cut sugarcane setts. The capacity of the developed cutter is 6500 setts/h. The time required to cut setts for one hectare by the developed machine is 2.13 h. The time saving over manual operation is 93%. The annual benefit per unit is Rs 66,960/. The machine has been

commercialized to two manufacturers M/s Sumeet Technologies, Pune and M/s Regent Engineering Co., Pune and sold more than 550 units.

Fertilizer band placement cum earthing up machine: The tractor operated (26 kW and above) fertilizer band placement cum earthing up machine has been designed and developed at GBPUAT, Pantnagar. The machine is suitable for simultaneous placement of fertilizer, earthing up and cutting of weeds in crops such as maize, sugarcane, potato etc having more than 50 cm row to row spacing. The urea fertilizer application rate ranges from 60 to 250 kg/ha. It helps in top dressing of fertilizer at 50 to 100 mm from the plant. The effective field capacity of machine is 0.56 ha/h with 82.4% field efficiency. The equipment is commercialized and one manufacturer in Udham Singh Nagar (Uttarakhand) has already supplied 10 units.

Tractor operated pneumatic planter: Tractor operated pneumatic planter has been developed at MPKV, Rahuri and is suitable for precision planting of single seed of crops like cotton, okra etc at pre-determined spacing. It consists of main frame, aspirator blower, disc with holes, metering plate, individual hopper, furrow openers and ground wheel. Seed coming in contact with rotating disc gets stuck to the holes on the plate through suction and falls when suction is cut-off at the lowest position near the ground. The effective field capacity of the machine for planting okra and cotton is 0.3 ha/h. The annual benefit of machine is Rs 92,000/unit. The equipment is commercialized to M/s Bhansali Agricultural Implements Co., Kopargaon, district Ahmednagar, Maharashtra.

Air sleeve boom sprayer: Three different types of spraying equipment i.e. air sleeve boom, aero blast and boom sprayers were evaluated by MPUAT Udaipur at three discharge rates and two nozzle pressures (2.8 and 4.2 kg/cm^2). Uniformity co-efficient of 2.20, 2.06 and 1.95 was found for air sleeve boom, boom and aero blast sprayers respectively. The bio-efficacy of monocrotophos was measured for pest like aphids, jassids, mealy bug, thrips, and whitefly. The percent reduction in infestation of pest was observed between 75-82 for air sleeve boom sprayer as compared to 68-75 for boom sprayer, 62-70 for aero blast sprayer and 11-18 for knapsack sprayer. The annual benefit is Rs 65,000/unit due to saving in costly chemicals and due to higher yield from reduction in percentage of pest infestation. The equipment is commercialized to M/s ASPEE, Mumbai and Gursukh Industries Samrala, Ludhiana.

Variable rate vertical boom type air-assisted sprayer with sensor attachment: The vertical boom type air assisted sprayer with sensor attachment was developed at MPUAT, Udaipur to deliver the precise amount of chemicals to match the tree configurations and to reduce pesticide use and environmental pollution. It consists of electronic control system with two ultrasonic sensors, a micro-controller board and two proportional solenoid valves, spray and air delivery systems. The spray delivery system consists of pesticide tank, HTP pump and nozzles. The air delivery system consists of a centrifugal blower and air delivery hoses. During operation, ultrasonic sensor detects the tree and determines its distance from the tip of the sensor. After receiving signal from micro-controller board, proportional valve opens and flow of pesticide is allowed to the nozzles and thus spraying is completed. It was observed that spraying with variable rate control sprayer significantly reduced quantity of sprayed liquid by 25, 33 and 30% for two years old pomegranate, three and half years old pomegranate and six years old guava orchards, respectively. These savings can be doubled when spraying is done on both sides of trees. Thus the unit can benefit Rs 50,000/annum due to saving in costly chemicals and increase in yield by 3-7%. The equipment is commercialized by M/s ASPEE, Mumbai.

Power operated garlic stem and root cutter: A cost effective electric motor operated two ways garlic stem and root cutter has been developed for reduction of human drudgery with increased output capacity. Its capacity with plain type cutter only for one side of the feeder box is 34 kg/h while it is 31 kg/h for serrated type cutter. The mean cutting efficiency of the equipment is 99.2, 99.1 and 98.9% for small, medium and large size bulbs respectively. The power requirement of cutting stem and root is 1.2 kWh. The machinery is commercially available.

Bullock drawn traction sprayer: MAU Parbhani centre has developed an animal operated traction sprayer suitable for medium and heavy pair of bullocks. It is suitable for spraying in soybean, cotton, pigeon pea, groundnut, maize, black gram and vegetable crop. The sprayer has two ground traction wheels of 1.2 m diameter and 100 mm width. The chemical is kept in a plastic tank of 200 liter capacity mounted on frame. A flexible PVC hosepipe of 9 mm diameter is used to carry high-pressure fluid. Fourteen hollow cone nozzles of discharge 720 ml/min are used to produce fine droplets. The power transmission from ground wheel to pump pulley is given with the help of three set of double grove pulley and V-belt. The RPM of pulley at 11 RPM of ground wheel is 825 rpm. M/s Padson Agro-industries, Akola (Maharashtra) has manufactured and supplied 70 units to farmers.

Women friendly three row rice transplanter: A 3-row rice transplanter suitable for women workers has been developed at OUAT Bhubaneswar. The anthropometric data and strength parameters of women female workers were considered for designing this transplanter. The rice variety (Khandagiri) of 18 days seedlings were transplanted using this three row paddy transplanter. The average missing hills were 3 to 5%. The row to row distance was 24 cm which can facilitate weeding by Mandwa or Cono weeder easily. The mean working heart rate of women workers was in the range of 124-128 beats/min. The average field capacity was 170 m^2/h with a mean working speed of 1.7 km/h. The equipment is being produced and marketed by M/s. Sidheswar Engineering, Bidyadharpur, Cuttack, Odisha.

OUAT Hand operated coconut dehusker

The OUAT centre of AICRP on ESA developed a hand operated coconut dehusker and it was compared with traditional method as well as another model marketed by Implement Factory Bhubaneswar. The mean values of working heart rate during operation of ESA dehusker, Implement factory dehusker and traditional method were 122, 123 and 125 beats/min and the Δ HR values were 41, 45 and 47 beats/min, respectively. However, the highest output of 212 dehusked nut/h was obtained with ESA dehusker followed by traditional dehusking method (99nuts/h) and Implement Factory dehusker (97 nuts/h). This unit has been licensed to M/s. Unicus Engg. Pvt. Ltd, 23, Madusudan Nagar, Unit – 4, Bhubaneswar and M/s. Swain Engg. Works, 1014, Nayapalli, Bhubaneswar. The two manufacturers have supplied more than 850 units to users.

Improved large cardamom harvesting knife: An improved large cardamom harvesting knife has been developed by CAEPHT Gangtok. The improved knife helps to reduce the force required in operation, to minimize accident chances, and to reduce the drudgery involved in the task. Weight of the improved knife is about 170 g and the blade material is EN 8 spring steel. Large scale demonstrations were organized in 14 villages of all the four districts of Sikkim and about 620 knives were made available to the large cardamom growers, SHGs and Panchayats.

Bullock drawn solar powered high clearance sprayer: In order to utilize available solar energy and labour saving, a solar powered bullock drawn high clearance sprayer has been devepoed for spraying in cotton and pigeon pea crop.The area covered by the solar powered sprayer was about 0.95 to 1.0 ha/h. The payback period is estimated as 3.6 years. The financial saving over the manual knapsack sprayer was 56% for cotton and 67.1% for red gram crop. The percentage of labour saving over the manual knapsack sprayer was 56.6 % for cotton and 59.5 % for red gram crop. Two manufacturers namely M/s Sudha Agro-Industries, Sinndhanur Road, Raichur and M/s Varsha Associates, Chitradurga have been identified for sale and service of sprayer to the farming community. They have supplied 10 units to farmers.

Bullock drawn ridge type drum seeder : Bullock drawn 8 row drum seeder is used for sowing of pre-germinated paddy seeds in line in puddle field at row spacing of 20 cm. The seed rate was

observed to be 30 kg/ha. The output was found to be 5.56 h/ha with field efficiency of 68.25%. The draft requirement was found to be 9.13% of their body weight which indicates that the drum seeder can be operated by a small pair of bullocks sustainably. This implement reduces drudgery, labour and cost as compared with manual line transplanting. Commercial production of bullock drawn drum seeder has been initiated through one Small Scale Industries (SSI) Unit named M/s Brundaban Jew Enterprises, Balasore. He has supplied 5 units to farmers.

Zigzag puddler cum clod breaker: A bullock drawn Zigzag puddler cum clod breaker has been developed by IGKV, Raipur. The equipment serves dual purpose; it can be used as an alternative to the wooden patella for clod breaking and can also be used for puddling operations. The pulverization by zigzag puddler cum clod breaker was significantly higher as compared to planker. The field capacity of implement was 0.26 ha/h with field efficiency of 62.85 %. Dept. of Agri., Govt. of Chhattisgarh by R/F Farm Implements Manufacturing Unit, IGKV, Raipur manufactured ten units and supplied to farmers.

Animal drawn multi-crop seed drill: The multi-crop seed cum fertilizer drill has been developed by MPUAT Udaipur for dry sowing of seed spices. The drill consists of a rectangular frame made of MS angle square section on which a seed cum fertilizer box is mounted. Two pneumatic wheels are provided for transportation on either side of main frame. These are mounted on axle. One of the wheel acts as ground wheel and supplies power to metering mechanism through chain drive. A clutch is also provided to engage of disengage the power transmission to seed metering mechanism. This implement has been commercialized through one manufacturer. He has supplied 8 units to farmers.

Bullock drawn stubble collector: MAU Parbhani centre has developed an animal operated stubble collector. The width and height of stubble collector is 165 cm and 30 cm, respectively. The collection of stubbles is done by 25 nos. tynes placed at 7.5 cm spacing. The tynes are bent inward so as to collect the stubbles. A wooden platform is also provided. The draft of stubble collector when the operator stood on its platform is 894.5 N and without operator standing it was 491.5 N. Animal drawn stubble collector takes 2.5 h per ha for stubble collection. The cleaning efficiency and output power was 87.93% and 0.80 kW, respectively. This equipment has been commercialized to two manufacturers and they have supplied 30 units to farmers.

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Annexure-II

[Part (b) of Lok Sabha USQ No. 5250 for 27/03/2018]

Projects and activities on harvesting equipment, modern transport and storage technologies

- Development of integrated system for harvesting and conveying of bunch crops
- Design and development of potato Combine harvester suitable for Indian condition
- Development of hybrid cold storage structure for onion and tomato
- Adoption/Evaluation of sensor flexible hermetic storage system of grains
- Self-propelled fruit harvest platforms
- Design development and evaluation of equipments/machine and storage structures for primary processing and low temperature storage of onions in bulk.
- Development of technology for destalking and packaging of dried chillies
- Value chain for fermented millet based products
- Development of pilot scale modified atmosphere storage system for selected fruits and vegetables
- Design and development of Wonder Bag for wheat storage
- Development of solar PV Vapor Compression Refrigeration system(2.54 TR) For Short duration Transient/On Farm Storage Of fresh Horticultural produce
- Development of an automated packing line for spherical horticultural crops for a pack house
- Development of technology package for processing and preservation of Palmyra tender fruit
- Development of Starch/PLA based biodegradable films for packaging of fresh produce
- Development of Hyperspectral imaging protocol for rapid and non-destructive detection of aflatoxins on maize and groundnut
- Development of tractor operated minor millet harvester
- Design and development of sugarcane rind removing equipment for hygienic juice extraction and bottling.
- Development of impedance based portable instrument for determination of maturity of Mango and Pear

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Annexure-III

[Part (c) & (d) of Lok Sabha USQ No. 5250 for 27/03/2018]

State wise, year wise release of fund for subsidy under Sub Mission on Agricultural Mechanization (SMAM)

STATE	RELEASED 2014-15	RELEASED 2015-16	RELEASED 2016-17	RELEASED 2017-18	TOTAL RELEASED
(RS. IN CRORES)					
Andhra Pradesh	10.54	7.28	48.99	132.92	199.73
Arunachal Pradesh	0.49	1.88	1.33	2.75	6.45
Assam	5.62	0 (allocation 6.92)	1.08	10	16.7
Bihar	9.01	0 (allocation 6.92)	14	0 (allocation 10.0)	23.01
Chhattisgarh	5.19	4	10	30	49.19
Gujarat	7.94	7.55	6	6.478	27.97
Haryana	2.55	0 (allocation 2.21)	0	45	47.55
Himachal Pradesh	1.02	0.75	4.95	11.70	18.42
Jammu & Kashmir	1.18	0.95	3.64	1.8	7.57
Jharkhand	3.58	2.54	2.25	1	9.37
Karnataka	9.62	0 (allocation 9.2)	44.41	75	129.03
Kerala	2.37	0 (allocation 1.92)	1	9.79	13.16
Madhya Pradesh	13.92	26.02	20	43.11	103.05
Maharashtra	20.34	15.96	15	34.13	85.43
Manipur	1.1	2.91	0	2.85	6.86
Meghalaya	1.25	0 (allocation 3.63)	0.9	0.5	2.65
Mizoram	0.5	2.03	2	3.66	8.19
Nagaland	0.62	2.85	3.33	16	22.8
Orissa	7.09	5.67	35.78	66.27	114.81
Punjab	2.09	0 (allocation 1.87)	52.09	48.5	102.68
Rajasthan	15.8	0 (allocation 12.41)	4.25	23.06	43.11
Sikkim	0.19	0.65	1.44	1.38	3.66
Tamil Nadu	8.44	21.39	30.3	51.34	111.47
Telengana	6.93	4.76	5.97	10	27.66
Tripura	0.39	2.44	2	15.52	20.35
UP	21.21	16.51	37.98	43.97	119.67
Uttarakhand	0.91	0.78	2.56	30.95	35.2
West Bengal	5.98	5.65	4	10	25.63
TOTAL	**165.87**	**132.57**	**355.25**	**727.68**	**1381.37**

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Annexure-IV

[Part (c) & (d) of Lok Sabha USQ No. 5250 for 27/03/2018]

State Wise Fund released under Seed Village Programme for the last three and current year					
					Amount Rs. in lakh
S. No.	**States**	Funds Released	Funds Released	Funds Released	Funds Released as on date 21.03.2018
		2014-15	**2015-16**	**2016-17**	**2017-18**
1	Andhra Pradesh	821.00	700.00	719.82	1312.39
2	Assam	1855.96	1060.00	1000.00	1173.41
3	Arunachal Pradesh	36.53	0.00	0.00	0.00
4	Bihar	638.83	600.00	705.62	324.02
5	Chhattisgarh	626.85	245.18	281.29	365.86
6	Gujarat	7.54	0.00		24.21
7	Himachal Pradesh	90.00	248.00	375.00	386.10
8	Haryana	1.52	1.34	0.89	0.51
9	Jammu & Kashmir	170.09	391.13	690.60	663.60
10	Karnataka		20.37	36.67	112.35
11	Kerala	156.00	3.50	26.72	0.00
12	Madhya Pradesh	975.05	586.52	1796.74	1543.53
13	Manipur	0.00	4.34	54.81	0.00
14	Maharashtra	954.18	0.00	600.00	2431.00
15	Meghalaya	34.22	97.79	10.50	141.74
16	Mizoram	0.00	0.00	25.00	0.00
17	Nagaland	100.00	131.43	0.00	74.99
18	Punjab	270.00	317.73	0.00	0.00
19	Odisha	1668.41	0.00	0.00	0.00
20	Rajasthan	659.89	122.36	100.97	1442.90
21	Tamilnadu	1288.24	988.81	822.00	1430.00
22	Telangana	393.13	350.00	670.00	1038.10
23	Uttar Pradesh	1047.40	899.70	124.40	1439.21
24	Uttrakhand	221.88	303.01	87.61	228.95
25	Puducherry	0.00	0.33	0.00	0.00
26	National Seed Corporatrion	0.00	0.00	979.87	0.00
	Total	**12016.716**	**7071.53**	**9108.49**	**14132.86**

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Annexure-V
[Part (c) & (d) of Lok Sabha USQ No. 5250 for 27/03/2018]

Expenditure on Fertilizer subsidy in the last three years (2014-15 to 2017-18)

(Rs. in Crores)

Year	Imported urea	Imported P & K	Indigenous P& K	Indigenous urea	City compost
2014-15	16,200.00	8,667.30	12,000.00	38,200.01	-
2015-16	16,400.00	9,968.56	11,969.00	38,200.00	-
2016-17	11,256.59	6,999.99	11,842.88	40,000.00	0.55
2017-18 (up to 28.2.2018	9,220.60	7,714.37	12,093.00	33,803.42	5.89

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Annexure-VI

[Part (c) & (d) of Lok Sabha USQ No. 5250 for 27/03/2018]

Inputs are related to subsidy on electricity provided to farmers

(INPUTS OF R&R DIVISION, Ministry of Power)

Electricity is a concurrent subject. Supply and distribution of electricity at an affordable rate to all the consumers including farmers, in a State / UT falls within the purview of the respective State Government / State Power Utility. The Government of India supplements the efforts of the State Governments through various measures for improvement in power sector and to provide electricity at affordable rates. The generation, transmission and distribution of electricity have a cost and in order for the supply to be sustainable the cost has to be recovered. If a State Government wants to provide cheap electricity to farmers in the country then the State Government will need to meet the costs of the power supplied.

The State Government can give subsidy to any class of consumers including farmers, to the extent they consider appropriate as per provision of Section 65 of the Electricity act, 2003 as well Clause 8.3 of the Tariff Policy. There is no provision to give free power to farmers by the Union Government.

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