

# FARM IMPLEMENTS & MACHINERIES

The cultivation of horticultural crops is labour intensive and requires timely operations for maximizing the output. With increasing labour scarcity, the need for mechanization is on the increase for horticultural crop production.

Machineries are required at every stage of crop production, starting from seed bed preparation, pit digging, nursery raising and transplanting, seed sowing, weeding, intercultural operations, spraying and harvesting as also to meet the specific requirements of small and marginal growers.

Short duration crops like vegetables and seed spices that are labour intensive need to be cultivated on ridges or raised beds so as to be made machine friendly. Cultivating crops in paired rows on raised beds is useful for enhancing irrigation efficiently by drip irrigation system. Maintaining high density of population coupled with regular pruning is gaining popularity in fruit crops for increased production. However, mechanization is also possible under such high density cropping systems.

Indian Institute of Horticultural Research has taken initiative in this direction and developed a number of machine designs and Processing Industry which are available for licensing by interested entrepreneurs.

## Technologies at a Glance:

### 1. MACHINERY FOR SEED AND PLANTING MATERIAL PRODUCTION

- Growing Media Siever
- Growing Media Mixer
- Nursery Bag Filling Machine
- Rotary Dibbler Cum Vacuum Seeder
- Automatic step seeder for vegetable nursery
- Manually Operated Garlic Bulb Breaker
- Water Melon Seed Extractor

### 2. MACHINERY FOR MUSHROOM SPAWN PRODUCTION

- Grain Cleaner
- Grain Boiler
- Boiled Grain and Chalk Powder Mixed Cum bag Filler
- Spawn Inoculator
- Solar and Electrical Energy Based Autoclave

### 3. MACHINERY/TOOLS FOR TRANSPLANTING, WEEDING, SPRAYING, PRUNING AND HARVESTING

- Tractor Operated Bed Former Cum Transplanter
- Tractor Operated Weeder
- Tractor hydraulic Operated Platform with Spraying system
- Mango dipping Tool
- Mango Harvester
- Sapota Harvester
- Lime Harvester

#### **4. MACHINERYFOR ONION CULTIVATION AND ON FARM PROCESSING**

- Onion Seed Extractor
- Manually Drawn Onion Seeder
- Animal Drawn Onion Seeder
- Tractor Drawn Onion Seeder
- Tractor Operated Onion Digger cum Windrower
- Motorised Onion De-Topper
- Motorised Onion De-Topper cum Grader
- Manually Operated Rose Onion Grader
- Manually Operated Common Onion Grader
- Motorized Common Onion Grader

#### **5. MACHINERYFOR RAW MANGO PROCESSING**

- Raw Mango Grader
- Raw Mango Peeler
- Raw Mango Slicer
- Raw Mango Cube Cutter
- Hot Water Treatment Unit For Mango

#### **6. MACHINERYFOR POST HARVEST OPERATIONS**

- Manual Pomegranate Aril Remover
- Motorized Garlic Bulb Breaker
- Manually Operated Garlic Peeler
- Fruits and vegetable vending van

## MACHINERY FOR SEED AND PLANTING MATERIAL PRODUCTION

### Growing Media Siever

- Sieves rooting media, farm yard manure, vermicompost, coco peat, sand and soil
- Capacity : 1 tonne/hour
- Labour saving: 50%
- Motorized, easy to operate
- Cost: Rs 75,000/-



### Growing Media Mixer

- Mixes rooting media, farm yard manure, vermicompost, coco peat etc., with sand and soil
- Capacity : 0.5 tonne/hour
- Labour saving: 60%
- Motorized, easy to operate
- Cost: Rs 75,000/-
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### Nursery Bag Filling Machine

- Sieves, mixes and fills the growing media into the nursery poly bags
- Capacity:1000 bags/h
- Cost: Rs. 5,00,000



### **Rotary Dibbler Cum Vacuum Seeder**

- Dibbles and sows vegetable seeds in the growing media filled protrays (98 and 50 cells)
- Capacity : 120 Protrays/ hour
- Labour saving: 80%
- Semiautomatic, easy to operate
- Cost: Rs 1,50,000/-



### **Automatic step seeder for vegetable nursery**

- Indexes the protray at predetermined space, dibbles and sows vegetable seeds in the growing media filled protrays automatically.
- Operated and controlled by sensors and Programmable Logic Control.
- Capacity : 150 - 180 Protrays/ hour
- Cost : Rs. 9,00,000/-



### **Manually Operated Garlic Bulb Breaker**

- Whole garlic bulb gets separated into cloves for planting
- Capacity:120 kg/h
- Cost: Rs. 25,000/-

### **Water Melon Seed Extractor**

- Watermelon Seeds and pulp gets separated.
- Capacity: 2 Kg/h (Seeds)~80 fruits/h.
- Cost: Rs. 75,000/-



### **MACHINERY FOR MUSHROOM SPAWN PRODUCTION**

#### **Grain Cleaner**

- Used to clean the grain from dust, sticks etc.
- Capacity: 200kg/h
- Cost: Rs. 50,000/-



#### **Grain Boiler**

- Boils grain in hot water with 9kw electric heaters
- Capacity: 100kg/batch
- Cost: Rs. 2,00,000/-



### **Boiled Grain and Chalk Powder Mixed Cum bag Filler**

- Mixed boiled grain with chalk powder and fills the mixed product into PP bags.
- Capacity: 100kg/batch (45 min.)
- Cost: Rs. 2,00,000/-



### **Spawn Inoculator**

- To inoculate mother spawn to sterilized grain bags
- Capacity: 100 bags/h
- Cost: Rs. 20,000/-

### **Solar and Electrical Energy Based Autoclave**

- Uses solar hot water, steam & electrical energy in separate boiler, to sterilize spawn/paddy straw filled PP bags
- capacity: 100-140 kg/batch-Spawn
- Cost: Rs. 3,00,000/-



## MACHINERY/TOOLS FOR TRANSPLANTING WEEDING, SPRAYING, PRUNNG AND HARVESTING



### Tractor Operated Bed Former Cum Transplanter

- Useful for transplanting vegetable seedlings
- Field capacity: 0.5ha/h
- Cost: Rs. 50,000/-

### Tractor Operated Weeder

- Removes weeds between rows in vegetable fields
- Field capacity: 0.2ha/h
- Cost: Rs. 25,000/-



### Tractor hydraulic Operated Platform with Spraying system

- Useful for spraying in orchards - Field capacity: 1 ha/h/person
- Useful for pruning in orchards - Field capacity: 4-5 trees/h.
- Useful for harvesting fruits in orchards - capacity: 120-150 kg/h.
- Cost: Rs. 1,50,000





### **Dipping Tool**

- Used to treat mangoes with Arka Saka Nivarak
- Capacity: 20-50 h/ acre
- Cost: Rs. 4,000/-



### **Mango Harvester**

- Harvests Mango with pedicel (1-2 cm)
- Capacity: 50 kg/h
- Cost: Rs. 350/- (without pole)

### **Sapota Harvester**

- Harvests sapota, guava, pomegranate
- Capacity: 50 kg/ha
- Cost: Rs. 350/- (without pole)



### **Lime Harvester**

- Harvests lime/lemn
- Capacity: 20kg/ha
- Cost: Rs. 350/- (without pole)



## MACHINERY FOR ONION CULTIVATION AND ON FARM PROCESSING

### Onion Seed Extractor

- Separates seeds from umbels
- Capacity : 30kg/h
- Cost: Rs. 2,00,000/-



### Manually Drawn Onion Seeder

- Useful for sowing onion seeds in flat bed
- Reduces seed rate by 40% and maintains uniform crop stand.
- Field Capacity: 0.06 ha/h
- Cost: Rs. 5,000/-

### Animal Drawn Onion Seeder

- Useful for sowing onion seeds in flat bed.
- Saves seed rate, time and labour by 40-50% and maintains uniform crop stand.
- Field Capacity : 0.5 ha/h
- Cost: Rs. 15,000/-



### Tractor Drawn Onion Seeder

- Makes raised beds and sows onion seeds.
- Field Capacity : 0.5 ha/h
- Cost: Rs. 20,000/-

### Tractor Operated Onion Digger cum Windrower

- Useful to dig onion bulbs.
- Separates the dug out onion bulbs from soil and windrows at the rear side of the machine.
- Field Capacity : 0.3 ha/h
- Cost: Rs. 1,00,000/-



### Motorised Onion De-Topper

- Cuts the leaf of harvested onion bulbs.
- Capacity : 200 kg/h
- Cost: Rs. 75,000/-

### Motorised Onion De-Topper cum Grader

- Cuts the leaf of harvested onion bulbs and size grades the de-topped onions into four grades
- Capacity : 300 kg/h
- Cost: Rs. 1,25,000/-



### Manually Operated Rose Onion Grader

- Useful to size grade rose onion into three grades.
- Capacity : 1 tonne/h
- Cost: Rs. 35,000/-

### Manually Operated Common Onion Grader

- Useful to size grade common onion into three grades.
- Capacity : 1 tonne/h
- Cost: Rs. 35,000/-



### Motorized Common Onion Grader

- Useful to size grade common onion into four grades.
- Capacity : 2 tonne/h
- Cost Rs. 1,50,000

## MACHINERY FOR RAW MANGO PROCESSING

### Raw Mango Grader

- To grade raw mangoes into four grades based on size
- Capacity : 500kg/h
- Cost Rs. 15,000/-



### Raw Mango Peeler

- To remove the peel of raw mangoes
- Capacity: 200kg/h
- Labour saving:90%
- Hygienic operation
- Cost: Rs. 3,50,000/-

### Raw Mango Slicer

- To slice raw mangoes
- Uniform size of slices of 20 mm thickness
- Labour saving:90%
- Capacity : 800kg/h
- Hygienic operation
- Cost: Rs. 3,50,000/-







### Raw Mango Cube Cutter

- To dice raw mango slices
- Uniform size of mango cubes of 10 gm each
- Labour saving: 90%
- Capacity : 1 tonne/h
- Cost: Rs. 3,50,000/-

### Hot Water Treatment Unit For Mango

- To treat freshly harvested mangoes in hot water to control anthracnose and fruit fly at pre-fixed temperature and time.
- Capacity : 500kg/batch
- Cost Rs. 25,00,000/- (As per the export guidelines of Directorate of Quarantine, Govt. of India )



## MACHINERY FOR POST HARVEST OPERATIONS

### Manual Pomegranate Aril Remover

- Separates pomegranate arils from the fruit.
- Capacity : 20kg/h
- Rs. 5,000/-



### Motorized Garlic Bulb Breaker

- Whole garlic bulbs are separated into cloves for further processing.
- Capacity: 400kg/h
- Cost Rs. 75,000/-

### Manually Operated Garlic Peeler

- Peels dried garlic cloves
- Capacity : 12kg/h
- Cost Rs. 15,000/-



### Fruits and vegetable vending van

- For city transport and retail sale of fresh fruits and vegetables.
- Capacity : 250 kg
- Cost Rs. 9,00,000/-