

## Women's Friendly Drudgery Reducing Tools

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### 1. HAND RIDGER



#### Function

For making ridges in field to sow vegetables on ridges. The equipment can also be used for making furrows in field for irrigation.

#### Brief description

A manually operated hand ridger has been developed for making ridges. It consists of ridger and pulling beam with T- type handle. Field needs to be well prepared for getting better performance of equipment for making ridges/furrows. The equipment is operated by two women workers, one for pulling and another for pushing and guiding.

#### Benefits

- About 67% saving in cardiac cost of worker per unit output with the ridger in comparison to the traditional method of making ridges.
- It avoids bending posture, which is generally adopted in traditional method with short handled tools for making ridges.
- Productivity of worker doubles with the equipment than traditional practice.

### 2. SEED TREATMENT DRUM

### Function

For uniform mixing of chemicals in seeds for its treatment before sowing.

### Brief description

The seed treatment drum consists of frame, handle and cylindrical drum. The cylindrical drum is mounted on a tri-pod angle iron frame. Three pieces of mild steel flat are welded inside the drum for helping in uniform mixing. Prior to start mixing of chemicals, workers are advised for wearing plastic hand gloves and mask on nose for health protection. After adding chemicals in drum, add little water, close the lid of drum tightly and rotate the drum for 20 to 25 revolutions. After 1-2 minutes of completing the work, open the lid and take the treated seed in a separate bag/container. A batch of 20 kg seeds takes about 5-6 minutes for complete operation i.e. filling, treating and emptying. Hand gloves and mask should not be removed till completion of the work. Children's should be kept away from the work place. After completing the work, workers are advised for thorough washing of hand, legs, face and eyes.

### Benefits

- Equipment provides safety to worker as direct contact with chemicals is avoided.
- Uniform mixing of chemical is done.
- It also avoids bending/squatting posture as done in traditional method of treating the seed.

## 3. FERTILIZER BROADCASTER

### Function

For uniform application of granular fertilizer in field.

### Brief description

Based on observations and feed back received from women workers during the experiment with commercially available fertilizer broadcaster, the broadcaster was

refined to make it suitable for them using anthropometrical data of women workers. It consists of a hopper with agitator, spreading disk, gear, crank with handle, rear cushioning pad and straps with shoulder pad for mounting. The broadcaster needs to be cross-mounted, as it is a belly-mounted equipment. A woman worker should start the broadcasting work keeping 2.5 m away from bund of field and maintain 5 m spacing during the operation in subsequent passes. The quantity of fertilizer in hopper may be observed from its transparent lid and when required it may be filled. The broadcaster may be cleaned thoroughly after use. A woman can easily mount and dismount the refined broadcaster.

### Benefits

- About 6% saving in cardiac cost of worker per ha with refined broadcaster in comparison to traditional practice was found.
- Uniform application of fertilizer is done.
- It saves workers from dust of urea at the time of application thereby enhancing safety of workers.
- Productivity of worker increased more than thrice with the equipment than traditional method.

## 4. CIAE SEED DRILL

### Function

For row sowing seeds of wheat, soybean, maize, gram, pigeon pea etc.

### Brief description

The CIAE seed drill have been refined for women workers using anthropometric data. It consists of a handle, hopper for seed and fertilizer, peg type ground wheel, a roller with cells and a hook for pulling the drill. The metering roller is directly mounted on the ground wheel shaft. The seed drill needs to be operated in well-prepared field. The seed drill is operated by two workers, i.e. one for pulling and another for pushing and guiding. Rope is tied to hook provided in front of the seed drill for pulling.

**Benefits:**

- Output is 18 times than traditional practice.
- Apart 87% saving in cardiac cost of workers per unit of output.
- By the use of seed drill, bending posture which is generally adopted in traditional method can be avoided.
- Line sowing is done with the equipment that promotes use of mechanical weeders for weeding thereby reducing cost and drudgery during weeding operation.
- Seed saving is also achieved.

**5. NAVEEN DIBBLER**

**Function**

For dibbling bold (like maize, soybean) or costly/scarce seeds in less area and for gap filling purpose.

**Brief description**

This dibbler consists of jaw type seed placement device, cell type metering mechanism, lever type power transmission system for roller and jaws and seed box with delivery system. After filling the desired seed to be sown in field, the worker should keep the dibbler at desired place and gently push the lever (front of dibbler) for opening the jaw so that seed may drop.

- About 13% saving in cardiac cost of workers per unit of output with the dibbler as compared to traditional.
- It also avoids bending posture, which is generally adopted in traditional method.
- Line sowing is done with the equipment that promotes use of mechanical weeders thereby reducing drudgery and cost during weeding operation.
- Seed saving is also achieved.

**6. TWIN WHEEL HOE**

**Function**

For weeding and intercultural in up land row crops in black soil region.

### Brief description

Twin wheel hoe consists of two wheels, frame, V-blade fixed on a tyne, U-clamp and a handle. The cutting and uprooting of weeds in field is done through push and pull type action of the equipment. The equipment is operated at optimum soil moisture condition and preferably after 20 -25 days of sowing i.e. when the weeds are small i.e. 1 to 3 cm height for better weeding performance.

### Benefits

- About 43 % saving in cardiac cost of workers per unit of output.
- It avoids bending/squatting postures, which is generally adopted with short handled hand hoe in traditional method.
- Productivity of worker increased more than three times with the equipment than traditional method.

## 7. IMPROVED SICKLE

### Function

For harvesting wheat, rice, soybean, chickpea, grasses and thin stalked crops.

### Brief description

It consists of serrated blade, ferrule and wooden handle. Cutting of crop stalk is being done with the improved (serrated) sickle by sawing action as against by impact or pulling action in case of local (plain) sickle. Due its less weight i.e. about 180 g the fatigue coming on wrist is less and the drudgery involved in harvesting is reduced as compared to local sickles which are heavier i.e. weighing about 350 g.

### Benefits

- About 15% saving in cardiac cost of workers per unit of output with improved sickle as compared to local sickle.
- Serrated sickles does not require the sharpening of cutting edge frequently.
- It also provides safety to the workers due to its better construction.

## 8. MAIZE SHELLER

### Function

For shelling maize from dehusked cob.

### Brief description

It is made of mild steel sheet and is octagonal in shape. Four tapered fins are provided in the maize sheller, which helps in shelling the maize grain from dehusked cobs. A cob is inserted into it and by twisting action shelling is achieved.

### Benefits

- About 15% saving in cardiac cost of workers per unit of output in comparison to the traditional practice.
- The productivity of workers increased 1.6 times than traditional practice i.e. shelling with the help of sickle.
- The chances of injury to fingers are eliminated thus making the operation safer for workers.

## 9. CONO WEEDER

### Function

Uprooting and burying of weeds in between standing rows of rice crop in wetlands.

### Brief description

Two truncated rollers one behind other are fitted at the bottom of a long handle. The conical rollers have serrated blades on the periphery. A float provided in front portion prevents the unit from sinking into the soil. The cono weeder can also be used for trampling green manure crop in addition to weeding operation. It disturbs the top soil and increases aeration also. The equipment is operated in standing posture thus avoiding bending involved during uprooting of weeds by hands in traditional practice.

- Bending posture is avoided thus reducing drudgery of workers in weeding

- operation in wetlands.
- Output is increased significantly.

## 10. COTTON STALK PULLER (JAW TYPE)

### Function

To uproot cotton plant stalks from soil.

### Brief description

The cotton stalk puller consists of long handle designed in such a way that when the handle is moved downwards, the front jaws firmly hold the stalk due to press plate hinged at the bottom of the main frame. On further downward movement the press plate acts as a pivot and the front jaw portion gets lifted up along the stalk. Once the operation is over the press plate comes to its original position with help of a tension spring fitted between press plate and mainframe. The unit can easily be moved to next plant with the help of ground wheel.

- Bending posture is avoided thus reducing drudgery and chances of backache of workers in cotton stalk pulling operation.