

The Plastic-film-covered Hill Planter

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Abstract

The plastic-film-covered hill planter is a new-type seeding machine, including two types which are mounted by 11kw and 40kw tractors. It is made up of fertilizing, plastic-film covering perforating film and hole seeding, soil sealing apparatus, and can work at 5-7km/h. The plastic-film covering and seeding of cotton, corn and soybean can all use this machine.

Key words: Plastic-film-covered, Hill planter, Apparatus.

The plastic-film-covered hill planter is mainly composed of plastic film covering unit, drum-type hill-drop unit and furrow coverer, some other types are also equipped with fertilizer drill unit. It can do the combined work of covering plastic film, sowing, plastic film perforating, soil covering at one time, and it is suitable to the covering plastic film as well as planting of the granulated crops, such as cotton, corn, soybean and so on.

1. Mouldboard and land roller

The role of the mouldboard and the bed drum is to smooth the seedbed, the mouldboard is used to push the big lumps soil to its both sides and to level the track of the tractor. Land roller is a cylinder, it rolls and presses the field by its own weight, maintains the plastic film planter in good profile performance. After rolling, the seedbed keeps smoothy and is good for afterwards covering plastic film and sowing.

2. Covering plastic film unit

This unit consists of opener, film covering unit, pressing-wheel, furrow coverer, arbor for supporting plastic film and other parts.

2.1 Opener

The opener can adapt disk or knife type. Disk opener has such the advantages as small fictional resistance, easily adjusting, and can be substituted replaced by disk coverer, therefor, covering plastic film planters usually adapt disk opener, the opener depth is about from 50 to 60 mm and adjustable.

2.2 Plastic film covering roller

During the moving of the plastic film covering roller, the plastic film is spreaded over the surface of the field, the position of the covering roller can be changed by adjusting the up rod of the suspension equipment. As it works, covering roller should exactly reach the surface of the field. The higher position will make it separate from the ground and difficult to make the plastic film smoothy, however, the lower position will make the plastic film deform and even split.

2.3 Pressing-wheel and furrow coverer

Pressing-wheel presses both sides of the plastic film into the ditches made by opener, then covers soil by furrow coverer(disk) to fix the plastic film. These are all the covers plastic film process.

To get good effect of plastic film covering, some longitudinal and horizontal extension should also be required. Longitudinal extension is relative to the speed of the assembling unit. Plastic film is placed on the support reel and can be freely rotated. The plastic film passes the tension axis and the bottom of the film covering roller. when it works, constant speed is necessary. Horizontal extension is realized by the lateral fictional resistance generated by the conical press wheel rolling.

3. Drum-type hill-drop unit

The main work component of the planter, drum-type hill-drop unit, which is one degree profile, can accomplish sowing, plastic film perforating and holes forming in a work circle. Its cavity can be used as seed box.

Drum-type hill-drop unit consists of several distributor boxes, hole forming unit, covers and drum circle. Distributor boxes correspond to hole forming units respectively. While the planter works, distributor boxes make a circle around the reel to accomplish the process of filling seeds, distributing seeds, carrying the seeds to hole forming unit. Hole forming unit is composed of movable spout and fixed spout. The movable spout can freely rotate in some degrees to open or close the hole forming unit. When the hole forming unit rotates to the bottom, distributor boxes exclude the seeds into the hole forming unit, then the movable spout is closed by the gravity and the centrifugal inertia force. When the hole forming unit rotates to the ground, it begins to dig holes and at this moment, the tail surface of the movable spout rotates reversely by the reverse force of the ground, then the hole forming unit is opened and the seeds inside are excluded into the hole. The space of the hole forming unit determines the plant spacing.

4. Furrow coverer

Furrow coverer, consists of a disk and a coverer drum, is used to cover soil on the crop rows. As it works, the disk collects the soil from

the both sides of coverer drum , in which a spiral dilivery board to the left and right sides is equipped . As the disk rotates , the soil is carried and excelled through the ringlike slot to cover the correspond hole of the crop rows, while the rows except the crop hole keep clean , free from soil .

The plastic film covered planter showed in the figures is a new type planter. The planter has the advantages of low cost , easily performing , and is suitable to large area plastic film covering sowing of corn , cotton and other crops. The main parameters are given in the follow table.

Table: The performance parameters of plastic-film-covered planter

No.	Parameter	Units	Parameter Value	Remarks
1	external form size (LxWxH)	mm	1820x1600x780 1000x1600x1100	work state transport state
2	weight	kg	260	
3	necessary power (tractor)	kw	11	three-point suspension
4	work range	mm	1800	effective range 1200
5	suitable plastic film width	mm	1400	
6	row spacing	mm	220-1100	adjustable cotton 300 corn 600
7	plant spacing	mm	90-135 200-245	
8	grains per hole	grains	2-5	
9	planting depth	mm	cotton 30 corn 50	depth below plastic film
10	work speed	km/h	7.5	

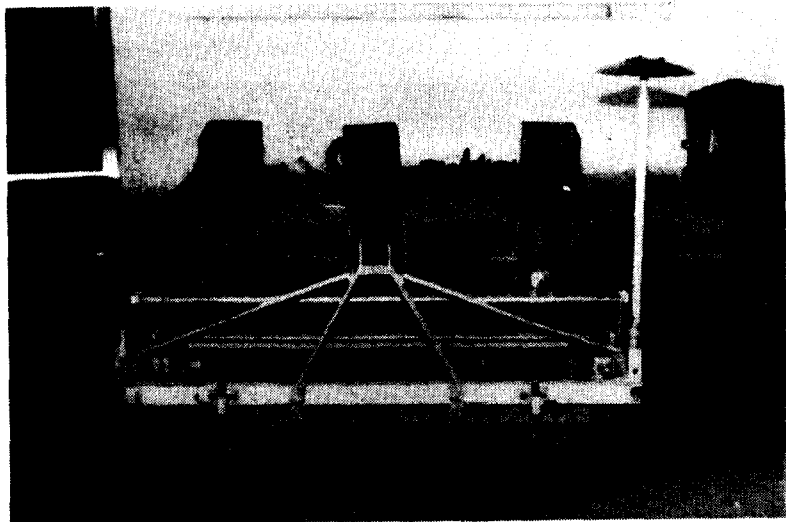


fig: The plastic-film-covered hill planter

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