

Design and Fabrication of Onion Seed Sowing Machine

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ABSTRACT

India is associate agriculture primarily based country during which, seventieth of individuals depends on the end result of farming. But if we tend to observe that with increase in population the farm gets distributed among the family and since of this, farmer in India command averagely solely 2 acre farm. Also economically, farmers area unit terribly poor because of that unable to use tractors and alternative expensive instrumentality therefore they use ancient technique of forming. So we are thinking that human and animal efforts can be replaced by some advance mechanization which will be suitable for small scale former from economical and effort point of view. So we tend to area unit developing this instrumentality which can satisfy all this want and to resolve labour drawback. In this equipment we used ploughing rod, water pump and seed sower attachment. This machine perform three farming operation (ploughing, sowing, water spraying) which will be useful for small scale farming.

Keywords : Seed Sowing, Water Sprayer, Rotary to Reciprocating Motion

I. INTRODUCTION

Nowadays ,Onion (*Allium cepa* L.), is the most preferred flavouring vegetable for centuries, supposed to be originated in the western or tropical central Asia. The crop has been acknowledged for its different uses in Egypt ever since 600 B.C. Today, it is an indispensable vegetable used every day, in every household. It is used for consumption in the green stage as well as mature bulb. Onions are available in three colours – white (5%), red (7%) and yellow (88%) of total production. India produces all these three varieties of onion. It is grown especially in South and Central India. Onions are a key crop in many tropical countries, being valued for its flavoured nutritive qualities. The production of onions in world is 85.94 million tonnes of bulbs from 4.45 million ha (NHB, 2014).

The leading onion producing countries are China, India, USA, Pakistan, Turkey, Russia, Iran, Brazil, Mexico and Spain. India contributes nearly 22.57 percent of world onion production (NHB, 2014). India is the second largest producer of onion in the world next only to China however the productivity of onion in India is very low (14.21 tonnes/ ha) as compared to China (22 tonnes/ha) and other countries like, Egypt (33.7 tonnes/ha), Netherlands (49.7 tonnes/ha), and Iran (31.8 tonnes/ha) etc. The Republic of Korea has the highest onion productivity of 63.84 tonnes/ha in the world (FAOSTAT, 2013).

Some of the reasons attributed to low productivity in India include small land holding, use of local variety seeds, poor irrigation facilities and poor economic background of farmers, lower use of chemical fertilizers and pesticide, higher postharvest losses, lack of use of improved method of cultivation. In India, total area under cultivation of onion crop is

1.15 million ha with total production of 18.74 million tonnes. Maharashtra is the leading state for onion cultivation with the total production of 5.86 million tonnes from 0.47 million ha (NHRDF, 2014). Trend of onion production and leading onion producing states in India. In India, onion is mainly grown in the western, northern and southern parts both in rabi and kharif seasons. Its supply is available throughout the year although with different volumes.

ONION GROWING METHODS

There are two methods of growing rice. They are

1. Direct seeding
2. Transplanting

DIRECT SEEDING

In direct seeding method the seeds are broadcasted directly onto the leveled and puddled field. It is of two types,

1. Dry seeding
2. Wet seeding

1) DRY SEEDING

Ungerminated dry seeds are directly sown to dry soil either in rows or in random according to the requirement. Seed rate generally vary with the severity of the environment and the type of physical damages of the seeds. The seed rate varies from 150Kg/ha to 300Kg/ha depending on the level of weed infestation in dry seeded rice.

2) WET SEEDING

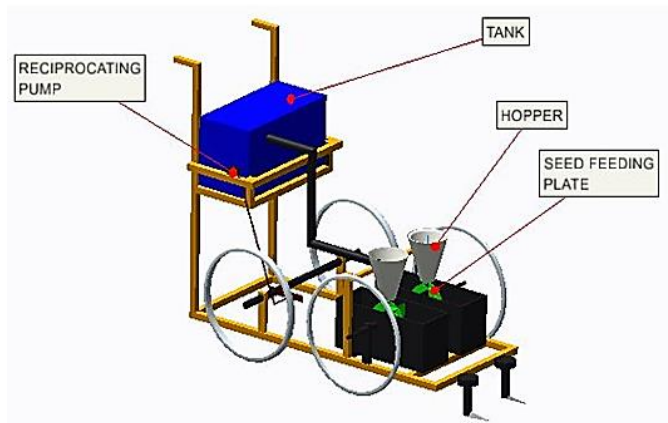
Pre germinated seeds are broadcasted into puddled and leveled fields which are free from standing water. At the time of puddling basal fertilizer should be mixed. Irrigation should be done when seedlings are of about 5cm tall. The stand establishment by this method varies with the quality of land preparation, weed competition, water management and rainfall during the initial period after sowing.

WORKING PRINCIPLE

Main objective of machine is drilling, fertilizer spraying, seed sowing & cultivating. For solving this purpose we have designed this type of machine. When engine is started the auger bit drill tool will be activated to drill hole for seed sowing after that operator presses lever for drop a seed from hopper then the digging and sowing operation will be completed. The sowing operation can be done by semi manual. Cultivating tool is easily assemble and disassemble. This operation is done by the manual force.

For spraying operation motor, battery and switch is given. When switch is on, fertilizer pump from the motor and enters to the sprayer nozzle then it sprays with high velocity to the crops. In above 3d model of machine we can see in front of machine we have used 24 cc petrol engine from bottom of that engine we will place auger bit for drilling purpose on bottom side of engine we can see sprayer which is having 4 nozzles and we can adjust height of that nozzles. These nozzles are connected through pipe with pump and water tank, water tank is shown at end of machine. We have used hopper for seed sowing and that hopper is connected to lever at handle so handler can press lever to drop seed. Cultivating tool is detachable component of machine which can be attached at the end part of machine when cultivating has to be done. Machine has 2 wheels as to move machine in y direction for drilling purpose.

DESIGN DIAGRAM



SPECIFICATION

COMPONENTS	DIMENSION S
Bearing diameter	15mm
Diameter of wheels	90mm
Thickness of frame	5mm
Width of frame	20mm
Sheet metal thickness	2mm
Diameter of shaft	25mm
Length of machines	130mm
Width of machine	70mm
Sprayer tank	12 liters
Sprocket	15 teeth



II. CONCLUSION

This manual onion seed planter machine has considerable potential to greatly increase productivity. Other countries of the world where the two wheel tractor is the main traction unit in farming. The main task now is to promote this technology and have available to farmers at an affordable price. The manual Seed Planter machine can be readily made from local components in workshops. The only specialized items required are the seed meters plunger which can be sourced at an inexpensive price from local promoter and plunger is easily manufactured. By using of this machine, achievement of flexibility of distance and depth variation for different seed plantation is possible. Onion crop is perishable and delicate to handle, also being most labor intensive transplanting operation due to its close spacing as compared to other vegetables such as tomato and brinjal; a research work was taken to design and evaluate the onion seedling transplanter.

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