

# Design and Manufacturing of Onion Plantation Machine

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**Abstract** - The basic needs for small scale cropping machines are, they should be suitable for small farming fields, easy in design and technology and versatile for use in various farm operations. A manually operated template row planter was designed and implemented to improve planting efficiency and decrease drudgery involved in manual planting method. Seed planting is also possible for various size of seed at variable depth and space between two seed. Also it increases seed planting, seed/fertilizer placement accuracies and it is made of durable and cheap material affordable for the small scale peasant farmers. The usability, adjusting and maintaining principles are made simple for effective handling by unskilled operators (farmers).

**Key Words:** Manufacturing machine, Seed Sowing, Onion Plantation

## 1. INTRODUCTION

The sowing of seeds in the desirable position hence assisting the farmers in saving time and money. The basic objective of sowing operation is to put the seed and seed in rows at desired depth and seed to seed spacing, cover the seeds with soil and provide proper compaction over the seed. The paper discusses various aspects of seed sowing machine which will be helpful in the agriculture industry to tend towards mechanization. The agricultural industry has always been the backbone of India's growth. As the population of India continues to increase. Hence, there is a greater desire for Multiple cropping on the farms and this, in turn, needs efficient and high-capacity machines. Mechanization of the Agricultural industry in India is still in a stage of infancy because of that the lack of knowledge and the unavailability of advanced tools and machinery. In traditional process seed sowing is done by broadcasting manually, opening furrows by a plough and dropping seeds by human hand. For sowing in small areas dibbling i.e., making holes or slits by a stick or tool and dropping seeds by machine hand, is practiced. Multi row traditional seeding instruments with manual metering of seeds are quite popular with experienced farmers. In manual seeding, it is not possible to achieve uniformity in distribution of seeds. A farmer may sow at desired seed rate but inter-row and intra-row distribution of seeds are likely to be uneven resulting in bunching and gaps in the field. Traditional sowing methods have following limitations: In manual seeding, it is not possible to achieve uniformity in distribution of seeds. A farmer tries to sow at desired seed rate but inter-row and intra-row distribution of seeds are likely to be uneven resulting in bunching and gaps in field Poor control over depth of seed placement. Labor need is high because two persons are required for dropping seed

and seed. The effect of inaccuracies in seed placement on plant stand is greater in the case of crops India is set to be an agricultural based country approximately 78% of the population of India is dependent on farming directly or indirectly. Farmers are using the same methods and machines for the ages. E.g. seed sowing, spraying, weeding etc. There is a need for the development of effective spraying and weeding machine for increasing the productivity. Most of the developing countries of Asia have the problem of high population and low level of land productivity as compared to the developed nations. One of the main reasons for less productivity is insufficient power availability on the farms and low level of farm mechanization.

## 2. LITERATURE REVIEW

WAKCHAURE PRASHANT ET AL [1] He studied and investigate that a potato seed grower incorporates one or more planting units with an perpetual transport. A majority of glasses is joined to the transport and each container gets a potato seed as the conveyer voyages upwardly between upper and lower sprockets. As the mugs pass around the upper sprocket, any additional seeds in mugs are evacuated by centrifugal drive, differential speed and/or a vibration unit. These additional potato seeds are reused and returned to the seed bowl. The glasses at that point travel through a by and large even recreation area and around a third sprocket. The mugs are rearranged as they pass around the third sprocket and the seeds drop onto the back surface of the next forwardly adjoining glass. A direct structure holds the seeds within the wanted position until they reach a release zone where the person seeds are released into the wrinkle. The working of potato grower is based on transport and arrangement of the seed potatoes by a cup-belt. The capacity of this handle is or may be moos when planting exactness should remain at worthy levels. The most confinements are set by the speed of the cup-belt and the number and situating of the cups. It was hypothesized that the mistake in planting remove, that deviation from uniform planting separations, primarily is made by the development of the cup-belt grower. To decide the beginning of the deviations in consistency of situation of the potatoes a hypothetical show was built. The show calculates the time interim between each progressive potato touching the ground. Alluding to the comes about of the mode.

G. A. SANTHOSHKUMAR [2]: He studied the concept that In India transplanting of vegetable seedling is done manually all over the nation, as no machine is however accessible commercially for this work. Tall work requirement and deficiency of work amid top transplanting season causes

delay in transplanting and influences timely operation. The essential necessities for little scale editing machines are, they ought to be reasonable for small ranches, straightforward in plan and innovation and flexible for utilize in numerous cultivate operations. A manually worked format push grower was outlined and created to make strides planting proficiency and reduce drudgery included in manual planting strategy. Vegetable planting machine is a device which helps in planting of vegetable plants in a desired position hence assisting the farmers in saving time and money. The basic objective of planting operation is to plant the vegetable plants in rows at desired depth and plant to plant spacing cover the plants with soil and provide proper compaction over the plant.

MAREY S.A. [3]: This paper contained about plan parameters of the ridger wrinkle opener specifically influencing the wrinkle profile characteristics and the sum of applied water. Furrow-bed water system procedure is ordinarily utilized for water preservation, proficient fertilizer utilize and numerous other benefits. This consider is to assess the affect of plan parameters of the ridger wrinkle opener and planting strategies on sugar beet abdicate and water utilize effectiveness. Hence, field tests are conducted to (i) examine the impacts of share rake angles (20o, 25o and 30o), opener wing points (35o and 45o) and wing shape setups (straight and bended) on the wrinkle profile characteristics, transverse diffusing, draft drive, and (ii) assess planting strategies (i.e. edges with 50 cm lines dividing and pair of columns on bed with 30, 35 and 40 cm lines dividing), the wing shape and points on the development, sugar rate, root and sugar surrender, connected water and water utilize effectiveness.

MIR M. SEYEDBAGHERI [4]: This paper portrayed that Onion grower execution and seed assessments play exceptionally vital and energetic parts in onion abdicate and quality. Onion plants tend to quickly fill within the clear spots, veiling the impacts and underneath ground behavior of destitute stand that result in undersize tubers and lower the in general surrenders.

KYADA, A. R. ET AL[5]: This paper depicts that beneath seriously editing, opportuneness of operations. Manual strategy of seed planting comes about in moo seed situation, dispersing efficiencies and genuine back hurt for the rancher which limits the measure of field that can be planted. To realize the finest execution from a vegetables grower, the over limits are to be optimized by legitimate design and choice of the components required on the machine to suit wants of crops. Hand-pushed and Transnational Diary of Science Braide and Njidda (1989) created a combined poke grower which was found to be 73.4% productive and was three times quicker than manual planting with diggers and cutlass. Abu-Bakr (1987) made utilize of the rule of hit grower in applying fertilizers.

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### 3. MANUFATURING PROCESS USED

1. Welding (Electical and gas welding)
2. Cutting
3. Grinding
4. Drilling
5. Assembly

#### 3.1 FUNCTIONAL COMPONENTS OF MACHINE

By eliminating limitation of component of conventional plant sowing machine we design new component and provide special arrangement for sowing of small seed such as onion plant. There are eleven functional components of seed sowing machine.

- Sara Machine
- Frame Making
- Spoke Machine
- Spoon Attachment To Chain
- Ground Wheel
- Bearing Attachment To Chain
- Furrow Opener
- Sweep
- Plant Rotor Shaft
- Ground Wheel Shaft And Intermediate Shaft
- Chain And Sprocket Arrangement
- Plant Tube
- Plant Covering Unit
- Plant Box
- Plant Rotor
- Assembly

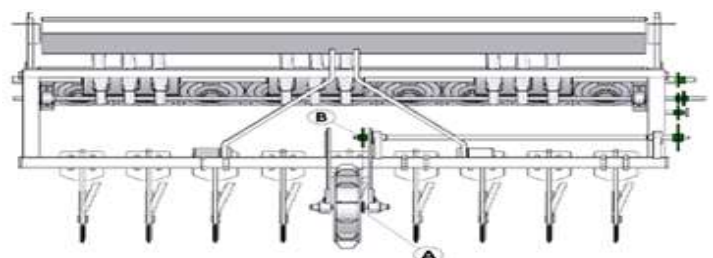


Fig. view of backside of planter

### 3.2 ADVANTAGES OF MACHINE

Following are the advantages of manual seed planter machine:

- Improvement in planting performance.
- Improvement in crop yield and cropping reliability. Increase in cropping yield.
- It increases onion planting. Seed/fertilizer placement accuracies.
- It is made of durable and low cost material affordable for the small scale peasant farmers. Lower maintenance cost.
- The plant can be planted at any required depth. The plant germination is be improved.
- Requirement of labor farmer also decreased. It takes less time for sowing.
- Plants can be placed uniformly in a row with required distance between plants. Provide proper compaction over the seed.

### 4. CONCLUSION

This manual onion plant planter machine has considerable potential to greatly increase productivity. Other countries of the world where the two wheel tractors are the main traction unit in farming. The main task now is to promote this technology and have available to farmers at a considerable cost. The manual onion plant Planter machine can be readily made from local components in workshops. The only specialized items required are the plants of onion. plunger which can be sourced at a less price from local promoter and plunger is easily manufactured. By using of this machine, achievement of flexibility of distance and depth variation for different plants plantation is possible.

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