

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES DESIGN AND MANUFACTURING OF MANUAL SEED PLANTING MACHINE

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ABSTRACT

The manual seed planting machine is operated manually but reduces the efforts of farmers thus increasing the efficiency of planting also reduces the problem encountered in manual planting. For this machine we can plant different types and different sizes of seeds also we can vary the space between two seeds while planting. The recommended row to row spacing, seed rate, seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climatic conditions to achieve optimum yields. The comparison between the traditional sowing method and the new proposed machine which can perform a number of simultaneous operations and has a number of advantages. This also increased the planting efficiency and accuracy. We made it from raw materials thus it was so cheap and very usable for small scale farmers. Here in this study efforts are taken to design and develop a seed planting machine which is suitable for ridge and furrow method and also plant the seed at specific distance with specific quantity and reduce the requirement of seed per unit area.

Key words: Seed Mechanization, Seed Sowing, Fertilizer Spraying, Chain drive system, Variable speeds.

I. INTRODUCTION

The agriculture is the backbone of India and for sustainable growth of India development of agriculture plays vital role. Seed sowing machine is a device which helps in the sowing of seeds in the desired position hence assisting the farmers in saving the time and money. As per change in shape and size of different seeds the parameters like distance between two seed, depth of seed and planting rate changes. This project is attempt to produce multifunctional and highly efficient seed sowing machine which will reduce time of plantation, cost of labour and enhance production. Seed sowing machine is a device which helps in the sowing of seeds in the desired 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 different aspects of seed sowing machine which will be helpful for the agriculture industry to move towards mechanization. The agricultural industry has always been the backbone of India's sustained growth. As the population of India continues to grow, the demand for produce grows as well. Hence, there is a greater need for multiple cropping on the farms and this, in turn, requires efficient and high-capacity machines. Mechanization of the Agricultural industry in India is still in a stage of infancy due to the lack of knowledge and the unavailability of advanced tools and machinery. In traditional methods seed sowing is done by broadcasting manually, opening furrows by a plough and dropping seeds by hand. The agricultural has always been the backbone of India's sustained growth. As the population of India continues to grow, the demand for produce grows as well. Hence, there is a greater need for multiple cropping in the farms and this, in turn, requires efficient and time-saving machines. The paper discusses different types of seed sowing machine which will be helpful for the agriculture industry to move towards mechanization. Traditional Sowing Methods: Traditional methods include broadcasting manually, opening furrows by a country plough and dropping seeds by hand and dropping seeds in the furrow through a bamboo/metal funnel attached to a country plough. For sowing in small areas dibbling i.e., making holes or slits by a stick or tool and dropping seeds by hand, is practiced. Multi row traditional seeding devices 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.

II. LITERATURE REVIEW

- Kyada, A. R, Patel, D. B.[2014] focused on the basic requirements for small scale cropping machines are, they should be suitable for small farms, simple in design and technology and versatile for use in different farm operations.
- D.Ramesh, H.P. Girishkuma [2014] mainly focused on the basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and seed to seed spacing, cover the seeds with soil and provide proper compaction over the seed
- A. P. Rathod, A. V. Gorde, R. K. Gondane [2015] focused on seed sowing and fertilizer placement is the main activity in farming. This paper deals with the various methods of seed sowing and fertilizer placement in India. Here is a comparison between traditional methods of seed sowing and newly designed machine which can perform simultaneous operations in less time and has several advantages.
- Roshan V Marode, Gajanan P Tayade[2013]focused on the seed feed rate is more but the time required for the total operation is more and the total cost is increased due to labour, hiring of equipment. The conventional seed sowing machine is less efficient, time consuming. Today's era is marching towards the rapid growth of all sectors including the agricultural sector.

III. COMPONENT

Seed and fertilizer storage tank

This storage device is one of the important device of the system. And is designed according to weight sustained by the robot as well as the required capacity for planting. This component is stationary. To the bottom of this tank seed sowing disc is arranged. This disc serves the function of distribution of the seeds, as for each complete rotation of the rotating wheel, only one seed falls from the tank. Also number of seeds falling from tank is varied according to requirements. This disc evenly opens the way to seed hence planting is done smoothly and accurately.



Fig:-Seed And Fertilizer Storage Tank

Bevel gear

The function of bevel is to transfer the motion from shaft to seed plate.the bevel gear arrangement is mounted at rear end. The rotating speed of bevel gear is depend on driving wheel which is front wheel.

*Fig:-Bevel Gear*

IV. WORKING

When the equipment is pushed forward by using handles, the front wheel rotates and the gear is mounted on the axle of the wheel is start to rotate and its rotation is then transferred to the pinion through the chain drive. The rotary motion of the pinion is converted into the reciprocating motion by the single slider crank mechanism, due to this arrangement the connecting rod moves upward and downward which then reciprocate the piston of the single acting reciprocating pump mounted at the top of the storage tank. During the upward motion of the connecting rod the pesticide is drawn into the pump and during the downward motion of connecting rod the pesticide is forced to the delivery valve, the delivery is connected to the pipe carrying the number of nozzles. Improved seed-cum-seed drills are provided with seed and seed boxes, metering mechanism, furrow openers, covering devices, frame, ground drive system and controls for variation of seed and seed rates. Power transmission is done by the gear sprocket transmission system. There are total three sprockets is used to transmit the motion to plunger and speed variation to get variable distance between the two seed. Total three types of variable distance like 5 cm, 20cm, 30 cm, are achieved by changing speed of sprocket. Speed of sprocket is changed by shifting chain from one sprocket to another sprocket through mechanism which is available in geared bicycle. Main power of machine is available from front wheel. Once person push machine, power wheel rotates according to speed of machine. So sprocket which is mounted on shaft of power wheel transmit power through gear and chain. Shaft1 is used for rotating seed plate and shaft2 used for rotating fertilizer plate. Power is transmitted from front wheel to shaft1 and shaft2 is rotated by shaft1 through chain drive. The function of spring is to control depth of seed.

*Fig:- Manual Seed Planting Machine*

V. CONCLUSION

This seed plantation machine has great potential for increasing the productivity of the planting. Till now tractor was the main traction unit for nourishment in farming. With the adaptation of this seed planting machine its purpose will be done. Hence there is need to promote this technology and made available to even small scale farmers with

affordable prices. This machine can be made by raw materials also which saves the cost of whole project and is easily manufactured in available workshops. The only cost is of metering device and sensors. Hence by using this machine we can achieve flexibility of distance and control depth variation for different seeds.hence usable to all seeds.

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