

STUDY OF THE ROTARY PULL PUNCH MULTI-SEED PLANTER: A REVIEW

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Abstract: The method takes more time and resources when cultivating conventionally. Its suitability for small farms, ease of design and installation, and utility for various crop plantations are requirements for tiny seed planting machines. Instead of employing the traditional approach, a manually controlled rotating pulls punch planter machine increases planting efficiency. With adjustable depth and distance, it is also possible to plant seeds of various sizes, which quickens the cultivation process. Unskilled farmers can handle the operating distance adjustment and seed size modification mechanism with ease. This push punch planter uses two moving wheels in this study, which plants seeds in two distinct rows simultaneously. So, it will take less time to plant seeds in small farms.

Keywords - *Planter, Manually Operated Pull Punch Mechanism*

1. INTRODUCTION

It is projected that a developing nation like India will employ hand tools more frequently during harvesting. The hand tool is more common because many Indian farmers do not have easy access to resources like draft animals and tractors. In India, the small landowners find the hand tools to be more practical. Our nation's population is always growing, necessitating the production of more food, which can only be done by employing excellent hand tools. The effectiveness of seed spacing and seed placement is lower when using the manual seed planting method. The farmer also experiences excruciating back pain as a result of it. Due to the high expense of planting equipment, small landowners continue to plant by hand, hence it is important to create a new planting method.

The design and development of sophisticated seed planting mechanisms, such as a rotary push punch multi seed planter, is the subject of this research. This pull-punch planter was used to plant a variety of seeds, including sorghum, wheat, and maize. Typically, seed to seed spacing is not maintained with any particular depth when using the standard approach. When using an advanced seed planter, a farmer can deposit seeds in two rows at once at the right depth and distance while avoiding many of the issues that come with this method. This work can be completed in less time, and it also requires less labor overall. This planter can also be used to plant seeds while being connected to a tractor or bullock wagon.

2. LITERATURE REVIEW

Adisa a.f.,braide f.g et al. [1] development on “design and development of template row planter” machine designed by Adisa is a manually operated planter, which is 94 % efficient in the spacing of seed but not on a rough surface. Also, braide constructs combined jab planter, which is more efficient (73.4 %), and this is three times faster than manual planting. But this template row planter achieves placing on rough and flat seedbed.

Roshan V. Marode et al. [2] work on “Design & Implementation of Multiseed Sowing Machine.” Describes the primary function of sowing operation to reduce manual efforts and for better productivity and



Fig. 1 Multiseed sowing machine

Effectiveness. The seed and nutrients are buried in the soil at the right depth and spacing, and the earth is then covered over the seed to provide optimum compensation.

Dr. Ramesh and H. P. Girishkumar [3] his review on “Agriculture Seed Sowing Equipment’s: A Review” In this given machine mechanism, they are able to active uniformity in distribution of seeds, Inter-row and Intro-row distribution of seeds.



Fig. 2 Agriculture Seed Sowing Equipment

Kalay Khan, Dr. S. C. Moses, and Ashok Kumar et al. [4] This paper discusses "Manually Operated Single Row Multi-Crops Planter." The effort is concentrated on designing and fabricating the seed planter machine mechanism to make it easy to operate, simple to maintain, and inexpensive.

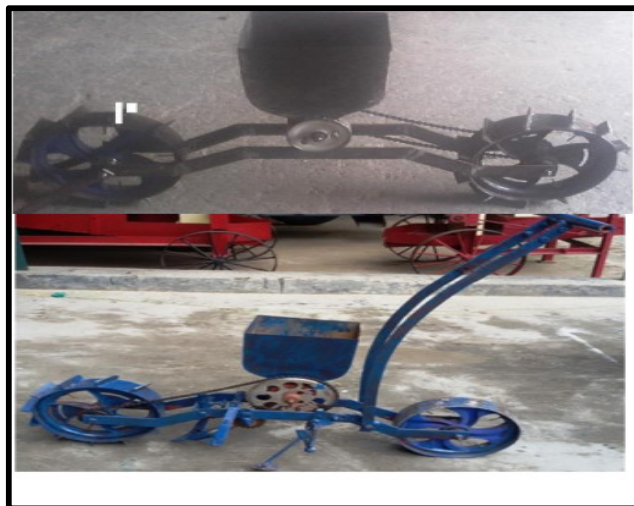


Fig. 3 Manually Operated Single Row Multi - Crops Planter

Atul b. Ekad et al. [5], as his research on "Design and Development of Pneumatically Operated Automatic Seed Sowing Machine" Describes Main objectives are:- Organize for depth control, maintain distance between two seeds. The availability of workers and wastage of grains are eliminated using this machine.

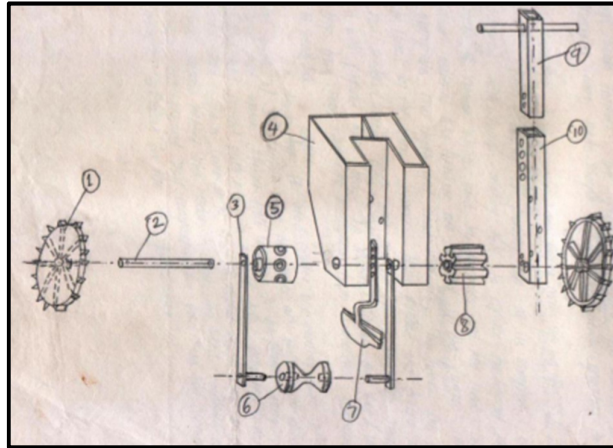


Fig. 4 Pneumatically Operated Automatic Seed Sowing Machine

Mr.Thange R.B., Mr.Ubale A.G. et al. [6] his study on” Design and Fabrication of Multipurpose Agriculture Equipment.” This equipment can perform a number of operations like sowing, weeding, tillage, etc. It works on Minimum cost and Easy handling and also, minimum weight.

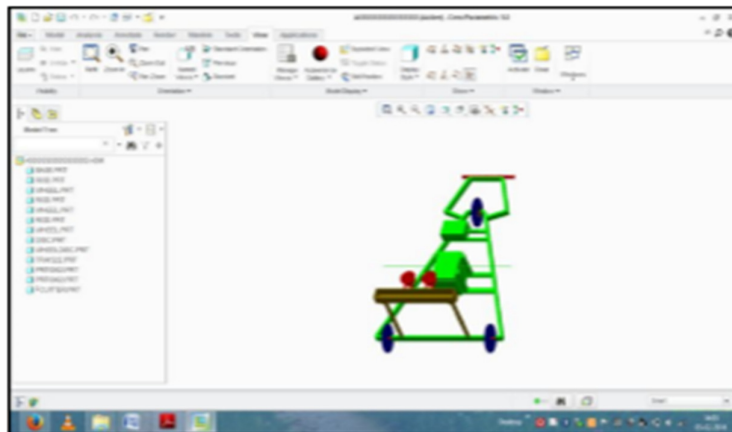


Fig. 5 Multipurpose Agricultural Equipment

Raut Madhuri, Prof. P. S. Gorane et al. [7] his research on “Multipurpose Seed Sowing Machine” Through this machine mechanism tried to solve the problem of farmers by using multi-purpose seed planter machine mechanism. The purpose is seed planting and placing the fertilizers also.

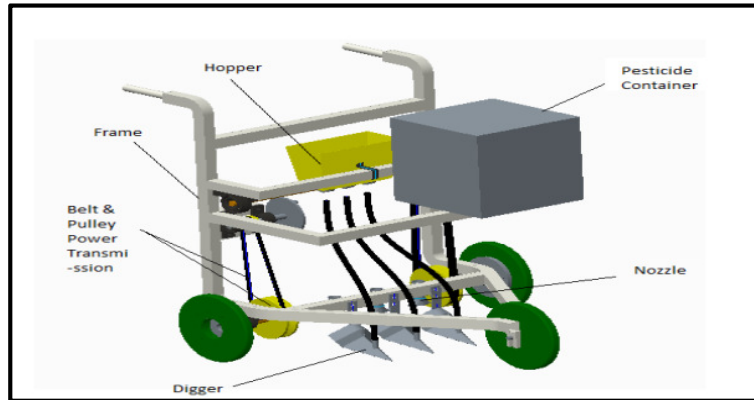


Fig. 6 Multipurpose Seed Sowing Machine

Ms. Trupti A. Shinde et al. [8] She carries out the "Design and Development of Automatic Seed Sowing Machine" experiment. Their system's mechanism was built by including an ultrasonic sensor, which detects any obstacles in front of the seed-planting machine and activates a buzzer.

Sheikh Mohd, Shahid Mohd Sadik, H.A. Hussain et al. [9] as part of his "Design and Fabrication of Multipurpose Farming Machine" project. It is highly likely that this versatile farming tool will increase crop productivity. So they created a multipurpose farming tool that could carry out several tasks concurrently, including sowing, irrigating, hauling, and transporting commodities. This equipment requires fewer personnel resources to run. As a result, growing crops is less expensive.

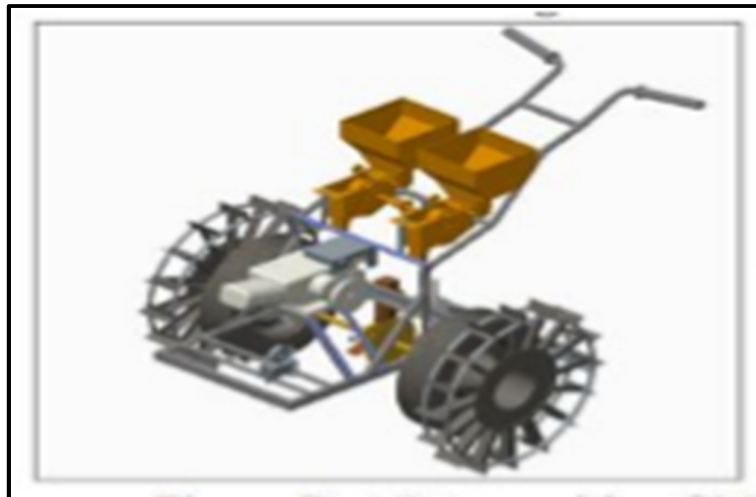


Fig. 7 Multi-purpose farming Machine

Aneeq Pathan, Aksh Sutaria, Sahil Yadav et al. [10] study on "Design & Development of Multipurpose Agriculture Equipment" In this paper he has studied the four types of mechanisms which are used in the machine to sowing to different kinds of seed and

also maintain the spacing between two grains. Also, in this research, he keeps the depth of seed at the same level.

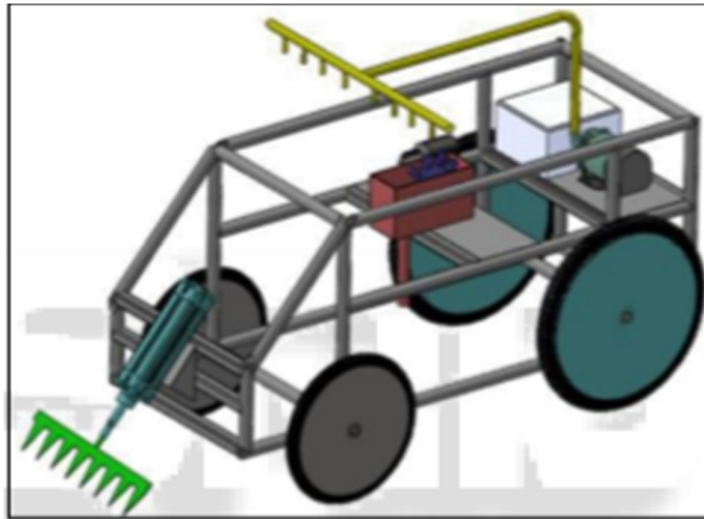


Fig. 8 Multipurpose Agriculture Equipment

Kiran Bhoite [11], as his review on "Schatz Mechanism with 3D-Motion Mixer-A Review," gives an idea on the drive mechanism of seed planter. The researcher uses a three-dimensional device for mixer, and the linkage used in the research is Schatz linkage.

In this, our project objective is to design and development of effective and efficient seed planter machine mechanism (hand tool). The fundamental project objective is to design a planting mechanism which should place the seed in rows at proper depth with effective distance adjustment between seed placing and it should cover the seeds with an appropriate layer of soil.

This demonstrates how mechanical elements like row regularity have an impact on seed sowing. We employ a power transmission mechanism, a seed meter mechanism, a plunger mechanism, etc. to advance this goal. The way this machine operates is that it pulls the wheel while transferring power to the plunger via a chain and sprocket arrangement.

PROBLEM STATEMENT:

The current seed planting process faces several challenges that hinder agricultural efficiency and farmer well-being. Firstly, the distance between planting seeds is fixed, limiting adaptability to varying crop requirements. Additionally, the lack of alternative methods prevents the cultivation of diverse seed types. This not only leads to a dependency on specific

planting techniques but also demands significant human resources and time, contributing to inefficiencies in the agricultural workflow. Moreover, the conventional seed planting method imposes a serious health concern, as farmers frequently experience backaches due to prolonged manual labor. Addressing these issues is crucial for enhancing agricultural productivity, reducing labor intensity, and promoting the overall well-being of farmers.

2.3 OBJECTIVES OF RESEARCH:

This study aims to achieve several specific objectives in the development and assessment of a novel crop planter. Firstly, the research aims to design and manufacture a versatile crop planter capable of accommodating a variety of seeds. The performance of the farmer using this planter will be meticulously evaluated by assessing factors such as the depth of grain in the soil along the row, precision in placing one seed in each hole with proper depth through seed metering, effective covering of the seed with soil, and the overall accuracy and speed of the planter. Additionally, the study seeks to determine the overall efficiency of the planter, with a particular emphasis on reducing the labor requirement and associated costs. Furthermore, the research aims to minimize the wastage of fertilizer, contributing to resource optimization. Ultimately, the objective is to develop a planter that not only enhances planting efficiency but also addresses critical issues such as labor intensity and time consumption in traditional agricultural practices.

3. METHODOLOGY:

In order to properly compact the soil above the seed, it is important to plant seeds and fertilizers at the right depth, spaced at a faster rate. For the best results, different crops require varying distances between seed placements and depths, which are also influenced by environmental factors. But there are different factors that also affect seed germination. The following are the factors, such as

- i) Proper depth.
- ii) Proper spacing of seed in the farm.
- iii) Avoid the loose soil for a high intensity of the grain.
- iv) Seed should cover adequately by soil.
- v) Proper distance between two seeds and multiple types of seed.

4. CONCLUSION

A multi-crop seed planter is a farming tool made to effectively sow various types of seeds in a single pass, enabling farmers to plant several crops at once or in succession without having

to manually lay the seeds. The manually controlled rotary push punch multi-crop seed planter has a great deal of potential to boost food production output in order to meet the demands of a developing country's expanding population. The machine mechanism has flexibility in various harvesting (planting) purposes. The primary purpose of developing this machine is to reduce the time required for planting, efficient planting with higher productivity.

It has various benefits, including:

Enhanced Efficiency: Compared to manual planting techniques, multi-crop seed planters automate the procedure, saving time and labor.

Planting a Variety of Crops: These planters are adaptable and can hold a variety of seed types, enabling farmers to grow a variety of crops in a single field.

Precision Planting: A lot of multi-crop seed planters are outfitted with tools that guarantee exact seed placement and spacing, enhancing crop growth and yield.

Cost Savings: Multi-crop seed planters can help farmers save money by lowering the requirement for manual labor and enhancing planting precision.

Enhanced Crop Rotation: To enhance soil health and lower the danger of pests and diseases, farmers can easily apply crop rotation systems.

Time management: By effectively controlling planting schedules, multi-crop seed planters assist farmers in maximizing planting seasons.

In conclusion, multi-crop seed planters are important instruments for modern agriculture because they provide accuracy, efficiency, and diversity in seed planting, all of which can result in higher crop yields and more economical farming methods.

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