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A Review: Design and Fabrication of Manual Seed Sowing Machine with Fertilizer

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Abstract: ***The present review provides brief information about the various types of innovations done in seed sowing equipment. 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. 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. As day by day the labour availability becomes the great concern for the farmers and labour cost is more, this machine reduces the efforts and total cost of sowing the seeds fertilizer placement. Seed sowing devices plays a wide role in agriculture field.***

Keywords: Fertilizer, Planting, Seeds metering device, Seeds sowing, Seeds spacing

I. INTRODUCTION

This Indian economy is based on agriculture. Development in agriculture leads to raise economic status of country. In India farmers are facing problems due to unavailability of labours, traditional way of farming using non efficient farming equipment which takes lot of time and also increases labour cost. This project is all about enhancement in seed sowing and fertilizer like farming operations by using multifunctional seed sowing machine. The main objective of sowing operation is to place seed at proper position respective of other placed seeds in every row at particular depth and provide a cover of soil on it. As per change in shape and size of different seeds the parameters like distance between two seed, depth of seed, planting rate chances. This project is attempt to produce multifunctional and highly efficient seed sowing machine which will reduce time of plantation, cost of labour, and enhances production. Traditional method of seed sowing based on assumptions of seed to seed spacing and depth of placement which is not at all efficient and beside this it requires lot of time and efforts too. As per change in climate farmers are facing one more problem which occurs due to harmful insects and pest. Farmers have to stay alert for fighting to this problem by using different fertilizer. Fertilizer is one of the common operation in agriculture field which requires lots of efforts. This machine contain pesticide fertilizer too which make it multifunctional. [2]

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. This project addresses improvement in agriculture processes like sowing of seeds on ploughed land and distribution of fertilizer combine by using mechanisms. Primarily this system works manually, but with lesser input energy requirement.

II. LITERATURE REVIEW

A. U. Malik and etc. conducted the field experiment to evaluate the effect of different seed rates on different sowing dates to suggest the appropriate seed rate of wheat for different sowing dates and suggested the farmers that wheat should be preerably sown on 15 November with seed rate of 125 kg/ha for better production. [1]

Conclusion: This research paper presents seed sowing machine. In this they present objective of seed sowing machine design, factors affecting seed emergence, some mechanisms. 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. From this we know that mechanical factors effects on seed germination like uniformity of depth of placement of seed, uniformity of distribution of seed along rows. In this power transmission mechanism, seed meter mechanisms, plunger mechanism etc. mechanisms" are used. The working as machine is pushed; power wheel is rotating which transmit power to plunger through chain and sprocket

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mechanism. From this we get idea that if we use the belt having small holes with defined thickness then it is beneficial for or project.

D. Ramesh and H. P. Girish Kumar presented review provide brief information about the various types of innovations done in seed sowing equipment. 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 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. Seed sowing devices play a wide role in the agriculture field. [2]Conclusion: 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. In this multipurpose seeding machine equipment consists of cylindrical shape container in which the seeds can fill. The container is attached on the four wheeled carrier assembly. It consists of metering plate bevel gear mechanism and two holes at the bottom depending on seed size. The working as plate will rotate in container when the bottom holes of container and meter plate hole coincide seeds will flow through pipe to soil. Here the metering plate gets rotating motion by bevel gear assembly and the bevel gears get the motion by rear wheels with the help chain and sprocket assembly.Laukik P. Raut and etc. al., studied to meet the food requirements of the growing population and rapid industrialization, modernization of agriculture is inescapable. Mechanization enables the conservation of inputs through precision in metering ensuring better distribution, reducing quantity needed for better response and prevention of losses or wastage of inputs applied. Mechanization reduces the unit cost of production through higher productivity and input conservation. [4]Conclusion: This paper represents the method used and the design of the machine. In this paper main objective is to make seed sowing simple and easy for the farmers. The design is simple and the machine is locally manufactured with light materials. The main objective is to make it affordable to the farmers so that they can manually do their own work without depending on labor. The above mentioned machine increases the efficiency of seed sowing so there by reducing the wastage of seeds and thus improving overall yield. Mahesh R. Pundkar and A. K. Mahalle is presented review provides brief information about the various types of innovations done in seed sowing machine available for plantation. The seed sowing machine is a key component of agriculture field. The performance of seed sowing device has a remarkable influence on the cost and yield of agriculture products. Presently there are many approaches to detect the performance of seed-sowing device. [5 Conclusions: The seed sowing cum fertilizer drilling machine completes the task of soil drilling, seed sowing, fertilizer spreading and soil marinating as it proves itself for a multipurpose usage. The machine comes with its biggest advantage that it is a non-electrical, manual or mechanically operated machine. It is also a comparatively less time consuming machine than the previous methods used for farming and crops cultivation.Pranil V. Sawalakhe and etc. all are investigated the today's era is marching towards the rapid growth of all sectors including the agricultural sector. To meet the future food demands, the farmers have to implement the new techniques which will not affect the soil texture but will increase the overall crop production. This Paper deals with the various sowing methods used in India for seed sowing and seed placement. [8]Conclusion: This paper represents the method used and the design of the machine. In this paper main objective is to make seed sowing simple and easy for the farmers. The design is simple and the machine is locally manufactured with light materials. The main objective is to make it affordable to the farmers so that they can manually do their own work without depending on labor. The above mentioned machine increases the efficiency of seed sowing so there by reducing the wastage of seeds and thus improving overall yield. Umed Ali Soomro and etc in Pakistan has evaluated three sowing methods and seed rate in a four replicated RCBD method and concluded that drilling method of sowing at seed rate 125 kg/ha is optimal for yield and quality of wheat grains, because the said sowing method and seed rate distribute seed uniformly and desired depth which provide appropriate depth for seed germination and crop establishment. [13]Conclusion: The paper is to compare conventional sowing methods and modern methods. The required row to rowspacing, seed rate, seed to seed spacing can be achieved by proposed machine. The machine reduces the human efforts.

III. METHODOLOGY

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. The recommended seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climate conditions to achieve optimum yields

A] Design of shaft:

The shaft is subjected to 15 kg of load.

W = 15 Kg F = 150 N

Bending Moment is given by,

$M = WL/4$ M

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Twisting Moment is given by
T = FR
Permissible stress is given by Applying A.S.M.E code
Ultimate tensile stress = Sut = 770 N/mm2
τper = 0.18 × 0.75 × Sut
τper= 103.95 N/mm2
A.S.M.E. code for Shaft design is given by,
$(\pi /16) \times d3 \times \tau per = \sqrt{(KbM)2 + (KtT)2}$
B] Checking Safety of Shaft:
Bending Stresses is given by
Bending moment = Moment of resistance
$(M/ I) = (Binduced /y)$
Where, Polar Moment of Inertia = π/ 32 × d4

IV. WORKING



Fig.3: Seed Sowing Machine

Length(mm) 5.0 Fluted	12 inches
Width(mm)	5 inches
Height(mm)	5 inches
Power Transmission	Through chain and pinion
Weight (kg)	8
Seeding mechanism	roller with narrow flutes
Hooper capacity(kg)	2
No. of roller	3

Table 1: Details of Project

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In our country farming is done by the traditional way, besides that there is the large development of industrial and service sector as compared to that of agriculture. The spraying is traditionally done by labour carrying backpack type which requires more human effort. The weeding is generally done with

1) *Specification:* The help of Bulls which becomes costly for farmers having small farming land. So to overcome these above two problems, we tried to eliminate these problems and designed the equipment which will be beneficial to the farmer for the spraying and weeding operations. When the equipment is pull forward by using handles, the driving wheel rotates and the pinion 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 chain drive another pinion mounted in seeding mechanism axle and seeding wheel is mounted for axel then rotating seeding wheel. The delivery is connected to the pipe carrying the 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.

V. CONCLUSION

A. A Seed sowing machine is designed for small farmers to improve their productivity. In this machine a common seed storage place is introduced to reduce the cost of the machine.

B. 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.

C. 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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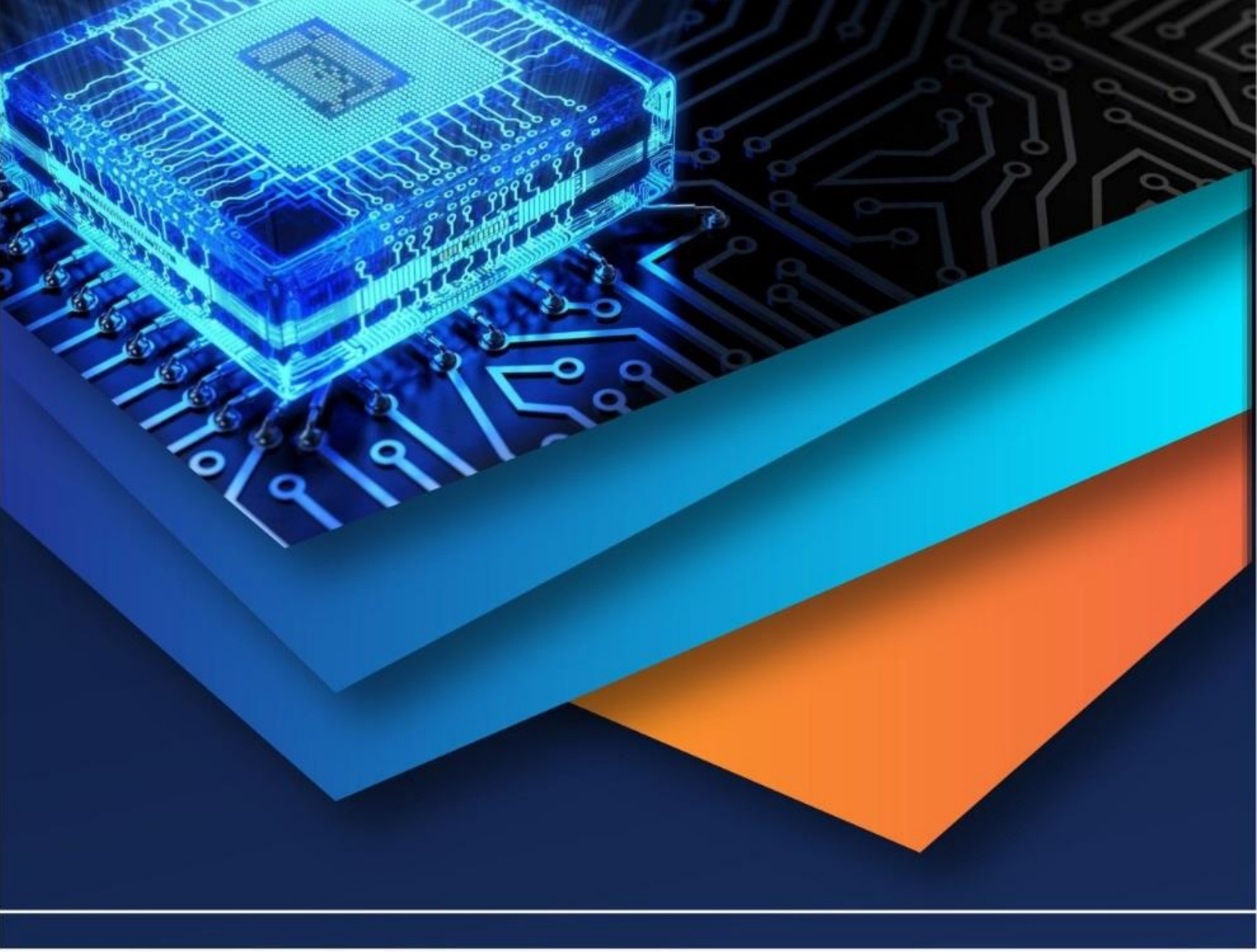
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