

Design and Manufacturing of Solar and Iot Based Seed Sowing Machine Robot

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ABSTRACT

The real power required for machine equipment depends on the resistance to the movement of it. Even now, in our country 98% of the contemporary machines use the power by burning of fossil fuels to run IC engines or external combustion engines. This evident has led to widespread air, water and noise pollution and most importantly has led to a realistic energy crisis in the near future. Now the approach of this project is to develop the machine to minimize the working cost and to reduce the time for digging and seed sowing operation by utilizing solar energy to run the robotic machine. In this machine, solar panel is used to capture solar energy and then it is converted into electrical energy which in turn is used to charge 12V battery, which then gives the necessary power to a shunt wound DC motor. This power is then transmitted to the DC motor to drive the wheels.

Keywords: Seed Sowing, Robot, Battery, Motor.

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I. INTRODUCTION

Today the environmental impact of agricultural production is very much in focus and the demands to the industry is increasing. In the present scenario most of the countries do not have sufficient skilled man power in agricultural sector and that affects the growth of developing countries. Therefore farmers have to use upgraded technology for cultivation activity (digging, seed sowing, fertilizing, spraying etc.). So it's a time to automate the sector to overcome this problem. In India there are 70% people dependent on agriculture. So we need to study on improving agricultural equipment. Innovative idea of our project is to automate the process of digging and seed sowing crops such as sunflower, baby corn, groundnut and vegetables like beans, lady's finger, pumpkin and pulses like black gram, green gram etc. and to reduce the human effort. Since we have lack of man power in our country, it is very difficult to do digging and sowing operation on time, Automation saves a lot of manual work and speed up the cultivation activity. The energy required for this robotic machine is less as

compared with other machines like tractors or any agriculture instrument, also this energy is generated from the solar energy which is found abundantly in nature. Pollution is also a big problem which is eliminated by using solar plate Seed sowing machine is a device which helps in the sowing of seeds in a desired position hence assisting the farmers in saving time and money. 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 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 manually, opening furrows by a plough and dropping seeds by hand. The agriculture 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.

II. LITERATURE REVIEW

Mahesh R. Pundkar and A. K. Mahalle are 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. Depth of seeding has shown to be an important factor affecting seeding vigor and crop yield. Seed metering device is a heart of seed sowing machine which is evaluated for seed distance, seed size between seed varieties. High precision pneumatic planters have been developed for many varieties of crops, for a wide range of seed sizes, resulting to uniform seeds distribution along the travel path, in seed spacing.

Laukik P. Raut and et. 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 unit cost of production through higher productivity and input conservation. Farmers are using the same methods and equipment for the ages. In our country farming is done by traditional way, besides that there is large development of industrial and service sector as compared to that of agriculture. The spraying is traditionally done by labor carrying backpack type sprayer which requires more human effort. The weeding is the generally done with the help of Bulls which becomes costly for farmers having small farming land. So to overcome these above two problems a machine is developed which will be beneficial to the farmer for the spraying and weeding operations.

D. Ramesh and H. P. Girishkumar presented review provides brief information about the various types of innovations done in seed sowing equipments. 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. Seed sowing devices play a wide role in agriculture field.

Pranil V. Sawalakhe and et. al., 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 fertilizer placement. The comparison between the traditional sowing methods and the new proposed machine which can perform a number of simultaneous operations and has number of advantages. As day by day the labor availability becomes the great concern for the farmers and labor cost is more, this machine reduces the efforts and total cost of sowing the seeds and fertilizer placement.

Sridhar H, studied the every year in INDIA, an average of 1980 Cr of rupees is wasted due to weeds. Our country faces the total loss of 33% of its economy from Weeds. The Losses are due to some of the following reasons, total loss of 26% from Crop Diseases, total loss of 20% from Insects and Worms, total loss of 6% from Rats has been surveyed. Shrinking farm lands, acute labour shortage, decreasing income per acre of cultivation, and economic frustration are some of the key factors hurting a farmer's confidence in continuing farming. Weeding control is done by: mechanical weeding, thermal weeding: flaming, biological control, chemical control, and by farming pattern. It has always been a problem to successfully and completely remove weeds and other innocuous plants. Invariably, weeds always grow where they are not wanted. This work involved the design and construction of mechanical weeder, after discovering that tools such as cutlass and hoes require high drudgery, time consuming and high labour force.

D. Ramesh and H .P. Girishkumar discussed the 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 seedsowing device. Depth of seeding has shown to be an important factor affecting seeding vigor and crop yield. Seed metering device is a heart of seed sowing machine which is evaluated for seed distance, seed size between seed varieties. for a wide range of seed sizes, resulting to uniform seeds distribution along the travel path, in seed.

III. FUTURE SCOPE

Seed sowing machine is a device which helps in the sowing of seeds in a desired position hence assisting the farmers in saving time and money. So considering these points related to spraying and seed sowing an attempt is made to design and fabricate such equipment which will be able to perform both the operations more efficiently and also will result in low cost.

- Decrease the operational cost by using new mechanism.
- Work reliably under different working conditions.
- Decrease the cost of machine.
- Decrease labor cost by advancing the spraying method.
- Machine can be operated in small farming land (1 acre).
- Making such a machine which can be able to perform both the operation

IV. ADVANTAGES

- It maintains the proper row spacing.
- The seeds can be placed at proper depth.
- Seed rate can be controlled.
- Many seeds can be sown by this machine.
- Mixed cropping can be easily done.
- Due to small size machine is portable. In addition, can be used in small area.
- Cost efficient.
- Less Man Power will be used.
- Decrease the disturbance of the agricultural soil by 98%
- Improve agricultural soil carbon sequestration
- Save energy, money and time of a farmer.

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VI. CONCLUSION

In India about 70% of the population lives in rural areas and their main source of income is dependent on agriculture sector. So, it is important to have special focus on agriculture sector and to apply

latest technologies and methods which are more advanced and efficient. This will lead to better growth rate of the

country. Our machine which operates on solar power when compared to different traditional seed sowing methods, it can be concluded that:

- 1) Sowing rate can be controlled
- 2) Seed spacing can be achieved
- 3) Less manual power is required
- 4) No pollution is caused
- 5) Economical
- 6) Variety of seeds can be sowed

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