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Design and Fabrication of Multipurpose Solar Operated Seed Sowing Machine

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Abstract – *In this current era farmers needs a new techniques of seed sowing so as to achieve there goals. The current machinery used in our era is consuming so much amount of fossil fuels and emitting high amount of pollutants , and considering availability of fossil fuels, we need to develop an machines which can run on renewable energy sources . This research paper is based on development of a such seed sowing machine which can be used for multiple things and which can help to reduce cost of the sowing and can be used multi purposely. Sowing machine should be suitable to all farms, all types of crops, robust construction, also is should be reliable, this is basic requirement of sowing machine. Thus we made sowing machine which 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. 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. For effective handling of the machine by any farmer or by any untrained worker we simplified its design. Also its adjusting and maintenance method also simplified*

Key Words: Solar panel

1. 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.

2. Literature review

2.1 MANUAL BROADCASTING SYSTEM

A field is initially prepared with a plough to a series of linear cuts known as furrows. The field is then seeded by throwing the seeds over the field. The result is a field planted roughly in rows but having a large number of plants [2]. Many projects are undertaken to overcome the drawbacks of broadcasting system. Some of those projects are given below. Drawbacks of manual broadcasting system are no control over the depth of seed placement. No uniformity in the distribution of seed placement. Loss of seeds & Time required for sowing is more.

2.2 CONVENTIONAL SEED SOWING MACHINE

Another method of sowing the seeds is with the help of a simple device consisting of bamboo tube. This bamboo tube with a funnel on it is attached to a plough. When the plough moves over the field, the tube attached to it leaves the seeds and kept in the funnel at proper depth as well as spacing. The plough keeps making furrows in the soil in which the seeds are dropped by the seed drill [2]. Drawbacks of this system are no proper germination of seeds. Wastage of seeds. No control over the depth of seed placement.

2.3 SOLAR POWERED SEED SOWING MACHINE:

In this system the basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and spacing, cover the seeds with soil and provide proper compaction over the seed [1]. This system uses solar panel which is made up of photovoltaic (PV) cells, which turns sunlight into electricity. The main disadvantage of this project was this system is not automatic.

3. Construction

Hollow square pipe are welded together to construct a rectangular frame of (750x250x350) mm. On the back side of the frame motor of 30 rpm (2.4 Amp), leveller of soil and a fertilizer sprayer of 250 rpm (1.3 Amp) is mounted

At the centre , solar panel of 0.3 Amp (10.7 v) , seed sprayer of 15 rpm (1.2 Amp) and a battery of 10 Amp (12 v) are fitted.

On front of the frame, adjustable digger is mounted to dig at required depth .

4. Working

This solar powered seed sowing machine & As per name indicate this machine is used for sowing seed. Which includes:-

- Dig the ground
- Sow seed inside the drilled hole
- Cover that hole with the help of adjuster.

First of all it dig the area upto required depth . after that , seed spreader motor start to rotate at 12 rpm , the gear tooth mechanism which is attached to spreader is started to collect the seed grains and it throws the grains into digged portion . At the end of the process , adjuster covers the digged portion with soil .

fig. 1 actual demonstrating model

5. Conclusion

As we know that in our country about 70% of population lives in villages & their mainly income depend on the agricultural source. Hence my prominent aim of this project Solar operated automatic seed sowing machine is to fulfill the tasks like digging, seed sowing, water pouring and fertilizing by using non-conventional energy sources. Thus solar operated automatic seed sowing machine will help the farmers of those remote areas of country where fuel is not available easily. And also they can perform their regular cultivation activity as well as saves fuel up to larger extent. At the same time by using solar energy environment pollution can also be reduced. Thus aiming to save the revenue of government & also most demanded fossil fuel.

6. Advantages

a. It saves labor cost .
b. It saves operating time and saving on cost of operation as compared – to conventional method of behind country plough.
c. It is light in weight as compared to present devices.
d. It reduced the use of man power up to 50 % .
e. It is cheaper so poorer farmer can also afford this modern devices
f. The plough enter in to the soil and automatic dropping of seeds takes place

7. Future Scope

- Introduction of Cutter in place of drill can be used as grass cutter equipment.

- Using remote control, Seed Sowing Machine can be made automatic.

- Addition of multi-hopper can be attached side by side for sowing of large farm.

- Water dripping unit could be included in seed sowing machine.

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