



Design of Solar Based Innovative Agricare Machine

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Abstract India is an agriculture-based country where 70% of the population is dependent on agriculture. As we know that in every farming, insecticide sprayer, sowing seeds and removing weeds are necessary. There are many machines which can isolate all those features but there is no machine which can do all these three features by itself and also machines which can isolate these features. Hand operated machines are mainly used for insecticides which are heavy in weight. The machine used for sowing seeds mainly depends on the type of crops. And there are not so many machines available for weed removal, so it is usually done manually which is time consuming. Our project aims to have all these three facilities in a single machine at an economical cost, in which pesticide is sprayed with the help of battery sprayer mechanism which is solar based. Seed feeding is done with the help of liver mechanism. Two adjustable blades have been used for weed removal.

Keywords Weed removing, Pesticide sprayer, Seed feeding

Introduction

Agriculture has great importance in the economy of India. About 70% of India's population is dependent on agriculture. Small scale farmers are interested in manually controlled due to its versatility, price and design. India is a land of farmers, including small, marginal, medium, and wealthy farmers. We have designed such a machine which can be used for multipurpose. such as removing weeds, sowing seeds, spraying. We have designed such a solar based spraying system which can spray at maximum rate in minimum time. Seed feeding is done with the help of liver mechanism. Two adjustable blades have been used for weed removal. We have



prepared solar based innovative Agri Care machine at very low cost. According to our study, which is more focused on helping gardeners in India and other countries, gardens do their best in spraying activities.

Scope of Research

1. Can be use in vegetable gardens.
2. Can be use in fruit gardens.
3. can be used in small scale of farming.

Literature Review

R. Joshua, V. Vasu [1] discussed Solar Sprayer -An Agriculture Implement. This Technology on solar energy can be extended for spraying pesticides, Fungicides and Fertilizers etc., using Solar Sprayers. Olathe, Kan. (March 3, 2022) [2] John Deere has introduced See & Spray™ Ultimate, a factory-installed system available for model year 2023 John Deere 410R, 412R, and 612R Sprayers that enables targeted spraying of non-residual herbicide on weeds among corn, soybean, and cotton plants. Fiaz Ahmad, Aftab Khaliq, Baijing Qiu, Muhammad Sultan and Jing Ma (June 8, 2021) [3] Advancements of Spraying Technology in Agriculture. R.D. Dhete [4] has worked on insecticide and agricultural fertiliser sprayers. He concentrates on various spraying equipment and strategies in his work. India's population is rapidly increasing, necessitating the modernization of agricultural sectors in order to fulfil the country's expanding food need. As a result of chemical fertilisers, soil fertility is declining. One of the most time-consuming components of crop production is weed management. R A Bulavintsev, S I Golovin, A L Sevostyanov, A V Volzhentsev, V A Stebakov and A V Kozlov (2021) [5] Research of seeding fulfilled with the help of stud-roller feed. Usage of seeding machine roller with studs incurved along the way of its rotation ensures more precise distribution of seeds along the length of the row. Mayya Sukhanova, Salavat Mudarisov, Victor Zabrodin, Andrey Bondarev & Faile Gallyamov (2022) [6] Analysis of the interaction of seeds with a centrifugal disk working body of a chamber-type treater. reduce the impact force of seeds by 100 or more times, compared with the impact force on other surfaces. Abhilash Kumar Chandel, V. K. Tewari, Satya Prakash Kumar, Brajesh Nare and Aditya Agarwal (May 2, 2018) [7] Research On-the-go position sensing and controller predicated contact-type weed eradicator. Steven A. Fennimore, David C. Slaughter, Mark C. Siemens, Ramon G. Leon, and Mazin N. Saber (2016) [8] Technology for Automation of Weed Control in Specialty Crop. Shivaraja kumar [9] 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. Prof. S.V. Deshpande, Damre Mayur, and Diwanale Swapnil [11] created the "Agricultural Reciprocating Multi Sprayer." Farmers in the agricultural sector frequently use the traditional way of spraying crops using a backpack-mounted sprayer.

Methodology Adopted

The Project Design of Solar based Innovative Agricare Machine is built by using Solar based technology. The proposed system in which three applications proposed together for usefulness for agriculture purpose. In this project owing, single row active weeding and spraying process taken together. After surveying finding problem then making such a machine in which combined effect matched.

Components of Solar based Innovative Agricare Machine

1. Main Frame
2. Handle
3. Nozzles
4. Polymer Tank
5. Pump
6. Y Joint
7. Battery
8. Solar Panel
9. Nylon Wheels



10. Hopper
11. Weed remover
12. Seeder

Design Implementation

2D & 3D Design of Solar Based Innovative Agricare Machine

- With the help of Solid Works and AutoCAD complete the design part of agricare machine.
- 19.05 mm diameter mild steel pipe is used for the frame of the structure. Polymer tank is mounted on the tank base plate of the main frame. 457.2 mm diameter wheels are used. Two nozzles are used for spraying purpose.



Figure 1: ISO view of the model



Figure 2: Side view of the model





Figure 3: Front view of the model

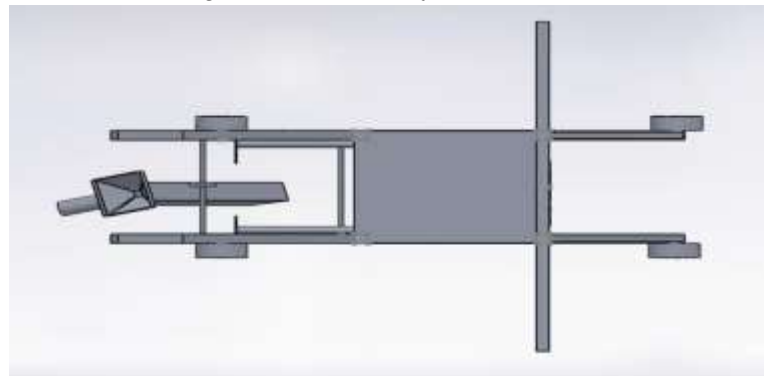


Figure 4: Top view of the model

- Dimensions of the innovation agricare machine in 2d view.

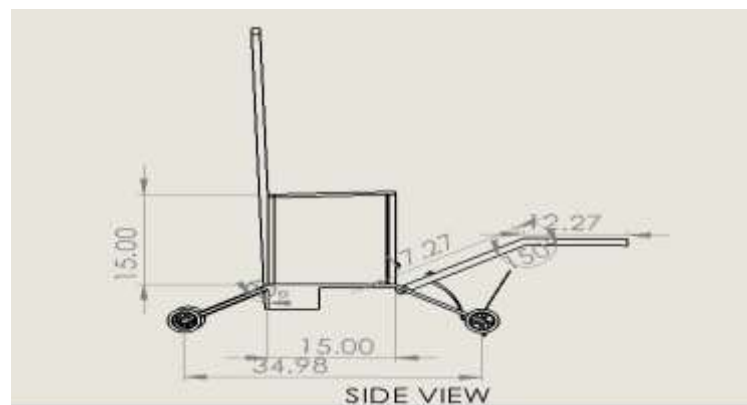


Figure 5: Side view dimensions (inch)

Conclusion & Future Scope

Following the manufacturing and testing of the "DESIGN OF INNOVATION AGRICARE MACHINE," the following conclusions were reached: - Based on the overall performance of the machine, we can confidently say that the project will meet the needs of small-scale farmers who are unable to afford expensive agricultural



equipment. In comparison to previous methods, the machine required less manpower and time. Our versatile agricultural equipment may effectively be utilised for fertilising, seeding, and weed eradication. All of the elements are linked in such a manner that the equipment may be rearranged or readily constructed with fasteners to the needed length and requirements for field operation at any stage of the farming process.

Scope for future work

- The researchers are now aiming towards different types of farming parameters to style autonomous multipurpose agricultural equipment because of traditional farm machineries and topological dependent.
- By increasing the equipment strength and quality to its peak, we can have multipurpose agricultural equipment for life time usage.
- By providing hydraulics, gear arrangements and some minor adjustments the equipment can also be made as tractor powered equipment.
- We can interface sensors to this Machine so that it can monitor some parameters.
- We can add Wireless Technology to Control Machine.

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