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Design And Development Wheel Fertilizer Spray Wheel Pump

Erande Priyanka Radhakisan[1], Erande Sakshi Sampat[2], Mandale Kajal Kailas[3]

[1,2,3]Department of Mechanical Engineering Jaihind College of Engineering, Kuran Pune, India
priyankaerande25@gmail.com[1], sakshierande2003@gmail.com[2], kajalmandale3@gmail.com[3]

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Abstract

The project applied the use of observation based on the manual method currently used using poisoning of various pests. The objective of this project is to design a device that is capable of producing a more effective pesticide sprayer for use in small or rural industries in the agricultural sector. Additionally, there are several research scopes that have been defined in this project, producing and developing ergonomic wheel sprayers. To reduce spraying time in vegetable gardens or orchards and to increase spraying efficiency as it contains more than one nozzle during spraying. All these are set to solve some of the problems that arise with the use of existing methods among which, the existing sprays cannot be effective and require additional time for spraying. The material for this project also requires special properties that do not rust and do not affect plants, based on the literature review conducted stainless steel is the most suitable for this project. While for the component formation process, the research methodology is used for the project production process by using flow charts as a guide to plan the production and testing of the project. As a result, the whole project was successfully produced with the additional rate of time saving of traditional methods. Based on these results, the results of analysis and discussions conducted, it can be concluded that this sprayer wheel has achieved the objectives discussed. In addition, this tool is also proven to be able to save time differently the traditional way.

INTRODUCTION

Farmers use the same methods and equipment to plant seeds, spraying pesticides. The method used by gardeners perform the process of spraying pesticides and herbicides. Gardeners need to cover their gardens with pesticides and pesticides to ensure that no shrubs grow and are used free of insects, caterpillars, and other pests. While gardeners will use a Knapsack manual sprayer to spray their garden, this may take a long time to finish spraying their garden. In addition, this manual Knapsack sprayer uses only one nozzle. There is a need for the development of effective spraying and weeding machines to increase productivity. Small farmers are particularly interested in manually operated backpack sprayers because of their flexibility, cost, and design. With a wheel spray pump combined with wheels and easier to move makes the working system very easy. This one trolley system by using this we can

reduce the maximum effort required to spray pesticides as well as we can spray pesticides in any direction or around the plant at crop height. This paper shows a model of a wheeled spray pump that will perform spraying at the maximum rate in the minimum time.

RELATED WORK

The principle behind the backpack sprayer is the pressure difference created by hand operated lever. It generally has a single nozzle through which liquid pesticides is forced out in fine droplet form. The Capacity of backpack sprayer is less than 20 liters. The components of backpack sprayer are the tank, piston pump, hose, spraying handle and a nozzle.

The wheel sprayer can be used on a small scale in the gardens and vegetable farms. Target small scale gardeners to get the best yields for plants to become more fertile and not easily damaged. This can be used in large industries, but larger industries should put more pressure on spraying because of the large field size and usually use machine tools to make the spraying session faster. So, the target consumer is for smaller industries and small gardens. Why choose a smaller industry because usually gardeners will use a heavy manual backpack sprayer and have to lift on their back to do the spraying session, but with this product they only need to push back and forth. In addition, this product can be spray both parts of the border, so the time taken is less than that required by a regular backpack sprayer. Wheel sprayer can make it more ergonomic than a manual backpack sprayer which reduces pain after spraying pesticide on crop.

Wheel sprayer is a machine that can spray poison widely but on a small scale. The design made is to design and develop the ergonomic machine. The size is made based on the diagram, which is 168cm long, 110 cm high and 50cm wide. This reciprocating pump uses a single sliding crank mechanism, in which the wheel gears act as a crank. There are two sprockets mounted on two different axles where one sprocket is mounted directly to the wheel axle. The connecting rod is attached to the other sprocket axle via a disc. In this power is given to the reciprocating pump piston through the rotation of the wheel. The connection link is engaged to the piston of the sprayer pump which moves forward and backward to give pump action and increase pressure inside the pump which is further used to spray the pesticide when the valve is opened on the sprayer pipe.

Literature Based Findings

Table1: Literature Based Findings

SR.NO.	AUTHOR	YEAR	TITLE
1	R.D. Dhete	2015	Agricultural fertilizer & pesticides sprayers
2	Pavan B. Wayzode	2014	Design Fabrication of Agricultural sprayers
3	Prof. S.V. Deshpande, Damre Mayur & Diwanale Swapnil	1987	Agricultural Reciprocating Multi Sprayer

DISCUSSION

A wheel fertilizer spray pump is a type of agricultural equipment used for spraying fertilizers, pesticides, and other chemicals on crops. The design and development of such a pump require careful consideration of several factors to ensure By addressing these areas, the design and development of wheel fertilizer spray pumps can continue to evolve, providing farmers and agricultural professionals with efficient, effective, and sustainable solutions for crop management.

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CONCLUSION

The design and development of a wheel fertilizer spray pump require careful consideration of various factors, including portability, spray coverage, flow rate, pressure, and durability. By incorporating innovative features, such as GPS and automation, solar power, advanced spray nozzle designs, and real-time monitoring, the pump can be optimized for efficient and effective operation.

References

R.D. Dhete has worked on “Agricultural fertilizer & pesticides sprayers”. In his work he emphasizes on different method of spraying devices

Pavan B. Wayzode, Sagar R. Umale, Rajat R.Nikam, Amol D. Khadke, Hemant carried out their work in “Design Fabrication of Agricultural sprayers, weed with cutter

S.C Gupta Covers fundamentals and application of spray wheel pump”