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# Development of Multi Crop Agricultural Insecticide Sprayer

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**ABSTRACT:** Spraying is one of the agricultural practices that are needed to ensure optimum crop growth and increase in the yields. It refers to the process of applying liquid chemicals to the crops or agricultural field with an aim of supplying essential nutrients, controlling pests and diseases and controlling unwanted weeds in the agricultural field. The demand of agricultural products increases day by day due to the rampant increase in the world's population. The main purpose of the machine is to enable farmers and gardeners to make the process of spraying pesticides and herbicides to their farm lands becomes more effective. It helps the farmers work because they no longer need to carry the tank on their back that can cause their back strain and hurt. This product only has to be push to forward just like how the trolley functions. It also comes with a pair of nozzles on the wing with nozzles on the wing, it can speed up the spraying process as it can spray left and right side at the same time.

**KEYWORDS:** Insecticide Sprayer, Multi Nozzles, Multi Crops.

## I. INTRODUCTION

Today, India ranks second worldwide in farm output. Agriculture and allied sectors like forestry and fisheries, accounted for 13.7% of GDP (Gross domestic product) in 2013 about 50% of the total workforce. The economic contribution of agriculture to India's GDP is steadily declining with the country broad based economic.

India is agriculture country. In India there are many equipments formed for farming. In the farm there are many types of lands available and whether conditions also different. In India there are different types of fruits, vegetables and grains produced and that sold in market.

Spraying of agrochemicals in the field is a tedious and laborious task. The conventional knapsack sprayer available in the market requires manual labour to operator, which is difficult to find due to movement of farm labourers towards cities.

Agriculture sprayer pesticide machine is designed to reduce human effort. It used to agriculture field by spray pesticide in farm to get better crop. Agriculture spray adjacent is used with pesticides order to enhance such as herbicides, insecticide, fungicides and other agents that control for eliminate.

Now a day's traditional spraying pumps we observing following problems: Costly for farmers having small farming lands, the spraying is traditional done by labor carrying backpack type sprayer which require more human effort, traditional spraying method having more time consuming, efficiency of traditional spraying method is less. and in traditional spraying methods require pressure is not produce.

As Above problems we sort out by our project. We decrease the human effort by using cycle sprayer, the area of spraying acquire large area than traditional sprayer. The efficiency of our sprayer is larger and continuous; it covers five rows at time.



### II.LITERATURE REVIEW

The design has been made to provide ergonomic spraying sessions for farming land to make sure they do not have to carry the heavy tank anymore. The handle is design based on range of high of farmers. So, they can hold the handle on their comfort level zone. The product also provided with stand to make sure that can stand the product when they are exhausted

while spraying or stand the tank when they are finish spraying. Animal-powered sprayers many have up to 10 nozzles (spaced about 50cm apart). They can be pulled by one or two animals. They have a larger capacity than hand sprayers, so are suitable for larger areas [3]. Tractor-powered sprayers can be very sophisticated. They are suited for large farms. it may be possible to hire someone to spray your farm with a tractor sprayer, rather than investing in one yourself [1].Hand-pulled herbicide sprayers are like a knapsack sprayer mounted on wheels. When the wheels turn, they pump the herbicide into a boom with four or six Spray nozzles. The height of the boom can be adjusted to deal with plants of different heights. These sprayers are sometimes called “pedestrian-pulled” sprayers. They have more nozzles and a larger tank than a knapsack sprayer, so can cover a lager area more evenly. They are Suitable for treating a whole field; they cannot be used to spot-spray in- dividable patches of weeds. Because the spray is behind the operator (unlike with knapsack sprayers), there is much less risk of breathing in the spray of getting it on your skin other clothing [2].

### III.METHODOLOGY OF PROPOSED SURVEY

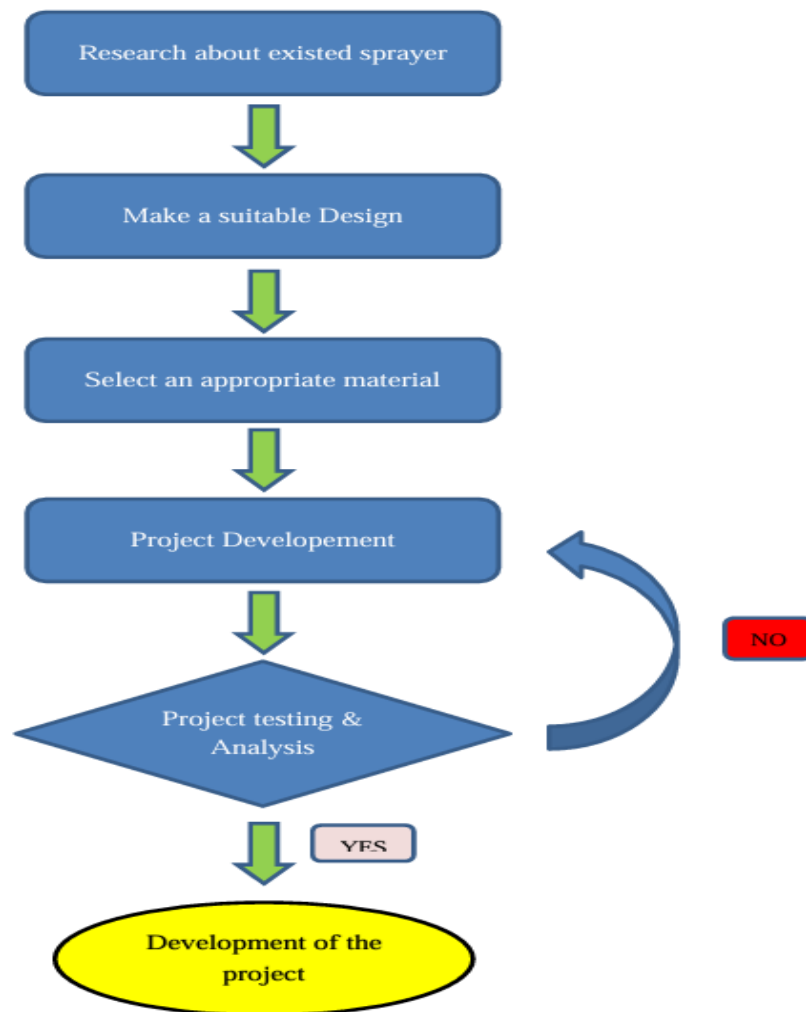


Figure 1: Methodology





The above Fig. 1 shows the detailed methodology.

- **Research and Analysis:** This involves studying the market, evaluating the needs and requirements of the target audience, and understanding the technical requirements of the product.
- **Concept Development:** This step involves brainstorming and creating initial concepts, sketches, and prototypes to identify the best design solution.
- **Engineering and Design:** This stage involves creating detailed engineering drawing, specifications, and a bill of materials (BOM) for the e-bike attachment. It also involves evaluating the structural and mechanical design to ensure it is safe, reliable, and meets the needs of the target audience.
- **Prototyping:** This step involves creating a working prototype of the e-bike attachment, which is then tested and refined to ensure it meets the specifications and requirements.
- **Testing and Validation:** This involves conducting comprehensive testing to validate the performance, reliability, and safety of the e-bike attachment. The testing should also evaluate the ease of installation, operation, and maintenance of the product.

#### IV EXPERIMENTAL RESULTS

Testing on crop like Tomato, Cabbage, Chilli and Banana is shown in fig. 2, which crop having their height, should be minimum 4ft. Firstly we get a farm land and selecting the crop. We use our project for spraying the pesticide.



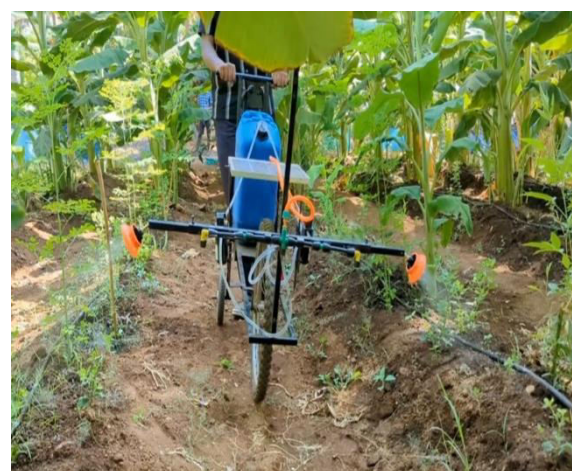
(a) Testing for cabbage



(d) Testing for Tomato



(c) Testing for Banana



(d) Testing for Chilli

**Figure 2: Testing for multi crops**

Fig. 2. Testing for multi crops (a) Testing for cabbage (b) Testing for Tomato (c) Testing for Banana (d) Testing for Chilli.



Bicycle sprayer is used for spraying, it is easy to handle. when starting spraying that time easy to hold the mechanism. At a time 5 rows covers the spray for spraying system. Both directions in V shape spray pesticide on crop. Pump creates same pressure in both mechanisms but in Bicycle sprayer this pressure equally distributes in 5 nozzles. And comparatively 2.5 times efficiency is greater than hand operated pump.

The bicycle mechanism takes low load, because load of the tank distributes on the whole frame in equally. When spraying the pesticide on the crop at different height is possible and at a time it takes 5 row and crop five sides covers and takes less time it gets result. Pesticides equally distributed by the nozzle and continue flow is possible.

#### **IV.CONCLUSION AND FUTURE WORK**

Water sprayer and chemical sprayer is very important in farm or garden and it is very well known by all people especially by farmers. These sprayers are used to spray pesticide or liquid to plants. Without these sprayers it will burden farmers and people to make sure their plants stay fresh because not get a water and stay in protection from bugs and pests because not been spray with pesticide or poison. This new innovation will give many benefits to people who use it. Hoping that this new innovation will contribute a good results and productivities in farming industries. The pesticide sprayer a proven the time of spraying is faster and it more efficient compare to the normal type hand sprayer. The farmers will be more efficient when to do the work and to produce better crops for sale. After than that, pesticide sprayer can comfortable spraying action because farmers just need to pull and push based on their comfort level and don't need to bend their back. Developed agricultural need to find new ways to improve efficiency. One approach is to utilize available information technology in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Precision farming has shown benefits of this approach but we can now move towards a new generation of equipments. The advent of autonomous system architectures gives the generation of equipments based on small smart machines that can do the right thing in the right place and in right time.

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