

## R & D Project Summary

<b>Name of Project:</b>	Agriculture Pesticide Spray
<b>Start Date of Project:</b>	10/04/2021
<b>End Date of Project:</b>	29/05/2022
<b>Faculty/Students Involved in project:</b>	Er. Rajan Sahai (Faculty)  Students (ME): Mr. Jatin Kumar Mr. Istiak Ahmed Sohil Mr. Tarun Kumar

### **Summary of Project:**

Farming is the backbone of Indian economy. In this agriculture sector there is a lot of field work, such as weeding, reaping, sowing etc. Apart from these operations, spraying is also an important operation to be performed by the farmer to protect the cultivated crops from insects, pests, funguses and diseases for which various insecticides, pesticides, fungicides and nutrients are sprayed on crops for protection. Farming has undergone a great evolution in last 50 years. Out of the various reasons involved for this evolution is control of various diseases on crops.

In the modern agriculture, the usage of pesticides is still increasing moreover the 90% of these pesticides are being applied in the form of spraying which will maintain environment friendly approach.

The argument for using existing conventional equipment is that farmers will face economic difficulties in case of chemical and electrically powered pumps as well as they will face health issues in case of hand operated pumps. One way to overcome this problem is to use the equipment developed for application of the pesticides using mechanical power. Insects are largely responsible for the crop destruction. These herbicides, pesticides, and fertilizers are applied to agricultural crops with the help of a special device known as a "Sprayer," sprayer provides optimum performance with minimum efforts.

The invention of a sprayer, pesticides, fertilizers, bring revolution in the agriculture or horticulture sector especially by the invention of sprayers, enable farmers to obtain maximum agricultural output. They are used for garden spraying, weed and pest control, liquid fertilizing and plant leaf polishing.

### **Scientific and Technological Uncertainties:**

Agriculture sector is facing problems with capacity issues, shrinking revenues, and labour shortages and increasing consumer demands. The prevalence of traditional agriculture

equipment intensifies these issues. In addition, most farmers are desperately seeking different ways to improve the equipment quality while reducing the direct overhead costs (labour) and capital. Thus, a significant opportunity rests with understanding the impact of a pesticide sprayer in an agriculture field. A pesticide sprayer must be portable and with an increased tank capacity as well as should result in cost reduction, labour and spraying time. In order to reduce these problems, there are number of sprayers introduced in the market but these devices do not meet the above problems or demands of the farmer

### **Overcoming Uncertainties:**

The conventional sprayer having the difficulties such as it needs lot of effort to push the lever up and down in order to create the pressure to spray. Another difficulty of petrol sprayer is to need to purchase the fuel which increases the running cost of the sprayer. In order to overcome these difficulties, I have proposed a wheel driven sprayer, it is a portable device and no need of any fuel to operate, which is easy to move and sprays the pesticide by moving the wheel.

### **Advancement of Knowledge:**

- The suggested model has removed the problem of back pain, since there is no need to carry the tank on the back.
- More no .of nozzle which cover maximum area of spray in minimum time at maximum rate.
- Proper adjustment facility in the model with respect to crop helps to avoid excessive use of pesticides which result into less pollution.
- Imported hollow cone nozzle should be used in the field for the better performance.
- Muscular problem are remove and there is no need to operate lever.
- This alone pump can use for multiple crops.
- After having a trial we have found that one finds it easy to operate push type machine. The pump can deliver the liquid at sufficient pressure where output of the nozzle in 1min is 0.3 and spray width 0.4m from calculation so that it reaches all the foliage and spreads entirely over the spray surface.
- It is little heavy but efficiently working in rough conditions of farm. It is economical therefore affordable for all kind of farmers.
- It requires comparatively less time for spraying so we can get more fields spraying per day. It is cost effective than the existing spraying pumps available in the market as no direct fuel cost or cost for maintenance is needed for this.
- Also it can be used for any crop as its maximum width is not more than one foot. Its nozzles can be adjusted to any height.
- The equipment is purposely design for the farmers having small farming land say 5-6 acre. It is suitable for spraying as well as weeding at minimum cost for the farmer so that he can afford it.
- The equipment will results more beneficial when it is subjected to moist soil for weeding purpose, due to moist soil the weed cutter can easily penetrate and dig out the soil and hence will easily accomplished the weeding process.
- The performance of the equipment will increase when it is operates on the smooth surface or less uneven surface and also it will be more effective when it is used on the crops having nearly similar height and having the less space between two crops

## **Project Outcome:**

- As this project is simple to make and cheaper in construction, spray machine has vast future scope.
- Highly efficient reciprocating pump could be attached to get best output.
- Various processes along with spraying could be done such as seeding and ploughing by adding more attachments.