

# DESIGN AND FABRICATION OF MECHANICAL PESTICIDE SPRAYER

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**Abstract:** In order to fulfil the hunger of growing population the modernization in the field of agriculture is necessary and important. Actually Indian farmer use to conventional backpack sprayer. Which increases time consuming and labour cost, and to overcome those problems we are using multi nozzle pesticides sprayer. For better yield of crop multi nozzle spraying is must this papers attends to design such a flexible sprayer. This work gives continuously flow of liquid at required pressure, height and gives freedom of easy engaging. This project helps you to give optimum results in less time and cost. Pushing mechanism required less effort and three wheel mechanisms gives proper balancing of machine.

**Keywords:** Multi nozzle sprayer, time, cost, pushing mechanism.

## 1. INTRODUCTION:

As India is well known as Agricultural based country. Most of the population is depending on farming. India has a problem of high population and low level of land productivity, low level of farm mechanization, insufficient power availability as compared to the developed nations. Even average land holders in Japan uses proper mechanization for agricultural which led to great achievement for increasing crop productivity. But in India for small farmer's mechanization is difficult even though steps were taken to increase availability of power operated machines, combine harvesters, power tillers, irrigation pumps, solar pumps, dripping system etc. In Agricultural sector use of cheap and beneficial equipment for effective weeding and spraying for increase productivity which is very important for better contribution for India's GDP. The principles of motion in which rotary motion from chain and sprocket is converted to reciprocating motion by connecting it to reciprocating pump. Which is used to the manually operated organic pesticides sprayer.

## 2. MATERIALS:

- \*Reciprocating pump.
- \*Iron bars.
- \*Tubeless Tyres.
- \*Connecting Rod.
- \*Cotter pin.
- \*Chain Drive kit.
- \*Multi nozzle sprayer.

## 3. METHODOLOGY:

Indian farmers use conventional method, there is large scope for development in agricultural sector. The spraying is traditionally done by backpack sprayer with labour which requires more human effort, it cover small area, time consuming and low storage capacity. Therefore to overcome above problems, we have design and develop the flexible equipment which will be beneficial to the medium and small scale farmer for spraying operations.

## 4. DISCUSSION:

In the upcoming years modern agriculture, the usage of chemical pesticides is still increasing. Moreover 90% of these pesticides are being applied in the form of spraying which maintains an environment friendly approach. The argument for using existing conventional equipment is that farmers will face economic difficulties in case of chemical and electrical powered pumps and will also face health issues in case of hand operated pumps. One way to overcome this problem is the use of equipment developed for application of the pesticides through the use of mechanical power. In selecting a pump for furnishing a supply of pesticides for farm use, or for spraying insecticides, herbicides or

fungicides, one may be sure that it was designed for the job to be done. The unit should have sufficient capacity to supply the needed amount of water and spray material in the allowable time.

## 5. ANALYSIS:

**Tank Capacity:** five litres (15 liters)

**Tyres Used:** tubeless tyres

**Weight with stand :** It can with stand a load of 65kg.

**Pressure :** 0.2-0.5mpa

**Net Weight :** 3.5kg

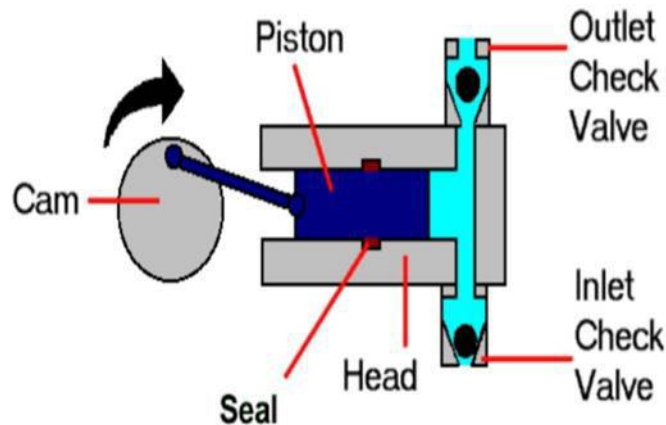
**6. FINDINGS :** The machine is tested on the farming land and got the satisfactory results and then it is compared with traditional method The results are as shown below.

For 1 acre of land = 75 liter of water + 250 ml of pesticide Cost of 1 litre pesticide = RS 7000/-

## 7. RESULT:

- It is very useful in farming in village
- Time Saving
- Pesticides fully utilised
- Labor cost totally reduced





1.1. Reciprocating Mechanism



1.2. Nozzle

## CONCLUSION:

- It is suitable design for current circumstances. It consumes less time and saves money as compared with conventional spraying.
- It covers twice area of spraying than manually spraying.
- It does spraying in less amount of time than that of conventional method does. So this requires less time.
- This machine does not require any fuel or power so maintenance is less. This model removes problem of back pain. As per our requirement we can separately use sprayer.

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