

# Overhead Pesticide Sprayer For Grapes Farm

**Gaurav Kotwal<sup>1</sup>, Rushikesh Jadhav<sup>2</sup>, Ram Kapure<sup>3</sup>, Vikash kumar Parit<sup>4</sup>, Prof. G. D. Wagh<sup>5</sup>**

1,2,3,4( Third Year Mechanical Engineering Student, Guru Gobind Singh Polytechnic,MSBTE  
Mumbai, India)

5( Professor, Department of Mechanical Engineering, Guru Gobind Singh Polytechnic, MSBTE  
Mumbai, India)

## ABSTRACT

*The present idea deals with the designing and fabricating a overhead pesticide sprayer which will be useful and affordable to the grapes farmers which will assist to increase the productivity of grapes crops. Though this project an attempt has been done to improve the method of spraying the pesticide that will enhance the productivity and increase the grapes farmer's income. So, we have designed a Overhead Pesticide Sprayer which will not only increase productivity but also will reduce the effort of the grapes farmers. The machine will save the time of the farmer as well as efficiency in spraying. This model carries movable overhead nozzle pesticides sprayer which will perform spraying at maximum rate in minimum time.*

**Keywords:** Overhead, Nozzle, Pesticide Spraying, Productivity, grapes farm.

## 1. Introduction:

One of the most common forms of pesticides application, especially in conventional agriculture, is the use of mechanical sprayers. Hydraulic sprayers consist of a tank, pump, a nozzle (with multiple nozzles). Sprayers convert a pesticide formulation, of one containing a mixture of water (or another liquid chemical carrier, such as fertilizer) and chemical, into droplets, which can be large rain-type drops or tiny almost-invisible particles. The size of droplets can be control through the use of different types of nozzle, or by altering the pressure under which it is forced, or a combination of both. The project aim is to improve spraying techniques & eliminate the human efforts, to decrease labor cost by advancing the spraying method and constant flow of spraying droplets. In Grapes Farm Blower sprayer on tractor is used. This method is very popular in Grapes farming. In this method one blower sprayer is mounted on the back side of small tractor. In blower there are 2-3 nozzles are used it pressured and mixed chemical, then it sprinkle on grapes cops with sprayer. This method have some disadvantage like in rainy season due to mud tractor faces so many problem to drive, And in this method pesticide come in direct contact with the farmer which drives tractor it's harmful for human and it has many more disadvantage. So from our project we make a innovative technique from which farmer can easily spray pesticide in minimum effort and in minimum working cost.

### 1.1 Need Of Project:

The objective of building this overhead sprayer machine is to eliminate the physical fatigue and the health hazards caused by pesticides working in grapes farm. Following drawbacks of various spraying techniques shows the need of our project.

1. Harmful pesticides and chemical are comes in directly contact with human body
2. In rainy season due to heavy rain there are difficulty (mud) for tractor for spraying pesticides
3. More man power required for spraying pesticides And fuel cost is also high from economical point of view
4. Labour cost is high

### 1.2 Statement of Problem:

Now a day for spraying pesticide in grapes farm small tractor is used. Small tractor which contain a sprayer with number of nozzles from which the pesticide is given to grapes. Pump is gives the high pressure

pesticide. At the time of spraying pesticide tractor faces many problem due to mud in rainy season, And the initial cost, operating cost, labour cost is very high and maintenance is also required time to time. And the chemical may have direct contact with farmer this is harmful for health.

The statement of project is “Design & Development of overhead pesticide spraying machine for grapes



farm.” which done the spraying work for agricultural field as per requirements of an Indian farmer

**Figure.** problem statement - 1



**Figure.** problem statement – 2

### 1.3. Objectives:

- 1) In rainy season tractor faces many problem to spray pesticide in farm due to mud.
- 2) more economical than tractor.
- 3) To avoid direct contact of chemical with farmer.
- 4) To reduce the pollution by electrical energy either using diesel.
- 5) To make spraying operation automatically.
- 6) To reduce human effort at the time of spraying pesticide.
- 7) To reduce operation time to spray pesticides.

### 2. Construction and working:

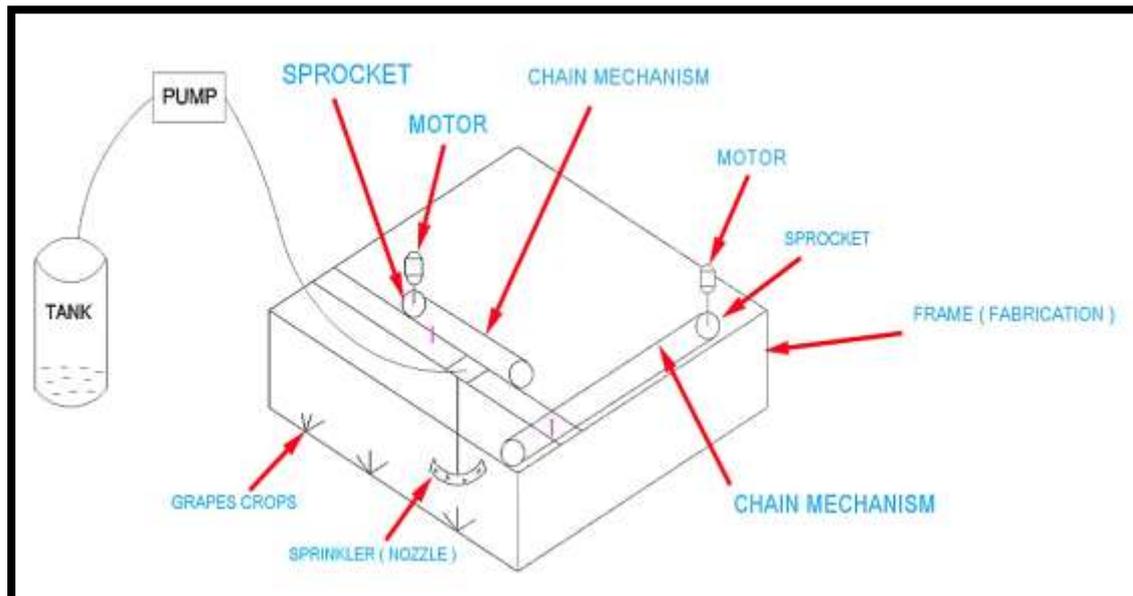
#### Components required :-

- 1) Frame (Fabrication)
- 2) PVC Tank
- 3) DC Pump
- 4) Nozzle Pipe
- 5) DC Motor
- 6) Shafts
- 7) Fasteners
- 8) Control Unit (DPDT Switch)
- 9) AC/DC Adapter

## 10) Chain, pinion &amp; sprocket wheel

**Working :-**

Figure Shows the concept assembly of the overhead pesticide sprayer for grapes farm. The sprayer operates overhead by means crane type arrangements which move forward, reverse, left & right as nozzle to moves as per motorized control. As a pump produces rotational motion to compress the liquid to the required pressure is achieved for spraying the chemical by using overhead nozzle to the angrified. The pesticide from tank sucks in pump forced the pesticide to overhead nozzle through the pipe; the numbers of nozzles are connected to spray the pesticide. We can adjust the pressure & location, which is required for spraying with the help of pump discharge & battery operated pump control unit. Using some adjustments height, position and angle of the nozzle can be adjusted. A pesticide is supply through tank using DC pump from tank & spread with the application of overhead motion operation.



**Figure.** Concept Drawing Of Overhead Pesticide Sprayer For Grapes Farm



**Figure.** Actual model of overhead pesticide sprayer

### 3. Literature Survey:

[1] Sagar S B, Punith G, Rakesh C N, Prakash M H, Lakshminarasimha N., done the work on , Design and Development of Trolley type Agrochemical Sprayer, According to his work, Majority of the Indian population is solely depends on agriculture, where 60% to 70 % of total population's family income depends on agriculture, in this majority of them are small scale producers.

[2] Anupam Moon, Amar Wairagade, Chaitanya Kakade, Nikhil Pathak, Rahul Moreshiya, Vijay Giradkar & Prof. S.N.Gandhare, done the work on , Design & Fabrication Of Paddle Operated Multi-Point Pesticide Spraying Machine, According to his work, We all know that in today's scenario the poor farmers are facing many problems in farming.

[3] Siddharth Kshirsagar, Vaibhav Dadmal, Prashant Umak, Govind Munde and P. R. Mahale, done the work on , Design and Development of Agriculture Sprayer Vehicle, According to his work, The population of the world is increasing rapidly. In order to fulfill their diet needs the production of food must be increased, but this must come at a cost affordable to everyone.

[4] Shailesh Malonde, Shubham Kathwate ,Pratik Kolhe, Roadney Jacob ,Nishat Ingole ,Rupesh D. Khorgade, done the work on , Design and Development of Multipurpose Pesticides Spraying Machine, According to his work, As India is agriculture based country and 70% people do farming and related work.

### 4. Advantages:

1. It is multipurpose machine for spraying chemicals as well as water.
2. Machine is easy to fabrication & assemble.
3. Machine is easy to operate.
4. It is profitable machine for spraying chemicals.
5. Cost of machine is very cheap one.
6. Maintenances cost of machine is low.
7. No direct contact of pesticide and Farmers.

### 5. Conclusion:

After applying such project spraying of pesticide can be done more efficiently as compared to other types of Spraying Techniques. The contact of highly toxic pesticide to humans can be prevented. Amount of Labours required is less for spraying pesticides. It gives more productivity in less input. Since this device of spraying pesticides also has less causes on environmental pollution. By making use of our method we can reduce the efforts of labors and also uniformly spray the fertilizers and pesticides all over the farm within less time as compared to other methods.

### 6. References:

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- [3] Siddharth Kshirsagar\*, Vaibhav Dadmal, Prashant Umak, Govind Munde and P. R. Mahale, Design and Development of Agriculture Sprayer Vehicle, International Journal of Current Engineering and Technology, AMET 2016, INPRESSCO IJCET Special Issue-4 (March 2016), pp.405-408.
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