International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 04 | Apr-2018 www.irjet.net p-ISSN: 2395-0072

# Hand driven four wheel automatic spraying machine

**Dhiraj Aher[1], Gufran Sayyad[2], Suyash Shimpi[3], Darshan Sonawane[4]**

[1,2,3,4] *Student, Guru Gobind Singh College of Engineering Nashik*

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**Abstract -** *India is agriculture based country and 70% population do farming and related work. Agriculture is required to be boomed to enhance the Gross Domestic Product (GDP) of the country by improving the productivity of farmers an production of crops. The productivity of the crops can be increased with the help of pest control and productivity of farmers will be increased by mechanization. Pesticide spraying is the necessary procedure in cultivation of the farmers. The present idea deals with the designing and fabricating a pesticide sprayer which will be useful and affordable to the farmers which will assist to increase the productivity of crops. Throughthis project an attempt has been made to improve the method of spraying the pesticide that will enhance the productivity and increase the farmer's income. So, we have designed a pesticide spraying machine which will not only increase productivity but also will reduce the effort of the farmers. The machine will save the time of the farmer as well as efficiency in spraying. This model carries multi nozzle pesticides sprayer pump which will performspraying at maximum rate in minimum time. Constant flow valves can be applied at nozzle to have uniform nozzlepressure.*

***Key Words***: **Pesticide, Farmers, Spraying, Time.**

## 1. INTRODUCTION

In order to reduce the harm to the environment and people the research and development of plant protecting machine focus on improving the mechanical work efficiency and the effective availability of pesticide. This option has agreed among people all over the world, especially in the developed country. Agriculture is an important sector of the Indian economy, accounting for 14 % of the nation's GDP. India is set to be an agricultural based country approximately 70 % of population of India is dependent on agriculture directly or indirectly. Our farmers are using the same methods and equipment for the ages. Indian agriculture is a diverse and extensive sector involving a large number of actors. It has been one of the remarkable success stories of the post-independence era through the association of Green Revolution technologies.

## 2. LITERATURE REVIEW

Shailesh Malonde, et al ,development of multipurpose pesticides spraying machine The driving unit of the machine is permanent magnet DC motor it is connected to the rear wheel through roller chain drive. The motor provides the requisite torque to the machine to run on uneven terrains of fields. The power given to the motor through battery is controlled by the controller and throttle (resistance controller).for spraying it consists of solar panel, buck and boost converter, battery charging kit, limit switches, battery, DC motor, pesticide tank, spray nozzles, etc. Sun radiations are incident on the solar panel.

Pavan B.Wayzode, et al ,describes Design and Fabrication of Agricultural Sprayer, Weeder with Cutter 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.

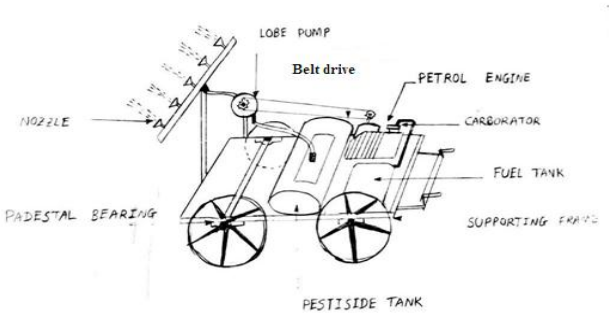
J. V. Bhanutej, et al ,describes the scope of the project is to develop a newmechanism for spraying of pesticides. The mechanism is designed such that the potential energy of the pesticide stored in the tank and additional spring force is used for generating the required velocity during spraying. The design includes stress analysis of the tank, study of spray pattern of jet and determination of minimum torque on the lever to operate the spring

## 3. METHODOLOGY

In this project the methadology we opted was first to do project selection then the development of the concept was carried out. After that data collection was done and the required specifications of design were obtained and the data analysis will be furher carried out and finally the concept drawing.

## 4. WORKING

The sprayer operator pushes the handle of machine to moves it in forward direction d. When the engine rotates then the chain sprocket mounted on wheel is also rotate at same speed. The chain drive transfers the motion of sprocket to pinion sprocket. The pinion sprocket and lobe pump is mounted on either side of same shaft, the rotary motion of pump shaft is converted into the rotary motion with the help of chain speed. Due to the rotation of pump it produces displacement of lobe to create the required pressure for spraying the chemical by using nozzle . The pesticide from tank sucks in by pump forced .Then pesticide is transferred to nozzle through the pipe; the numbers of nozzles are connected to spray the pesticide. We can adjust the pressure, which is required for spraying with the help of pump discharge & engine speed. Using some adjustments height, position and angle of the nozzle can be adjusted.




## 5. 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 profitablemachinefor spraying chemicals.
5. Cost of machine is very cheap one.
6. Maintenances costof machine is low.

## 6. LIMITATIONS

1. Spraying machine Speed is not constant.
2. Machine required more space.
3. The pump used in this project not self-prime.

## 7. APPLICATIONS

- For spraying a water on crops.
- For spraying chemicals on plants & trees
- For spraying chemicals on crops for protecting them from harmful pesticides & fungicides.

## 8. CONCLUSION

The concept of group project was included in our engineering syllabus with the view to inculcate within us the application ability of the theoretical concept of design and production engineering to practical problems. So also to help us to learn to work more as a team rather than an individual. In completing our project titled "agriculture sprayer" as per our time estimate gives us immense pleasure and a feeling of achievement. During the course of project we encountered numerous problems which we overcame with the able guidance of our project guide. This project report presents a brief mention of our efforts. Project work has given us good exposure to the practical field in the future of agricultural machineries.

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