

# FABRICATION OF RECIPROCATING MULTISPRAYER- A Review

Dr. S. M. Mowade<sup>1</sup>, Karishma Tarekar<sup>2</sup>, Mahendra Dakhare<sup>3</sup>, Prof. Naz Ansari<sup>4</sup>,

Head of Department<sup>1</sup>, Final Year Students<sup>2,3</sup>, Department Of Mechanical Engineering,

(Department of Mechanical Engineering, R.T.M.N.U. Smt. Radhikatai Pandav College Of Engineering, Nagpur

## Abstract:

Chemicals are generally utilized for controlling disease, insect and weeds in the crop. They can spare a yield from bug assault just when connected in time. The chemicals are expensive. Hence, equipment for uniform and powerful application is fundamental. Dusters and sprayers are for the most part utilized for applying chemicals. The less complex technique for applying chemical is most appropriate to compact apparatus and it for the most part requires straightforward equipment. Be that as it may, it is less productive than sparing, in view of the low maintenance of the tidy. It is versatile equipment and no need of any fuel to work, which is anything but easy to move and spraying the pesticide by moving the wheel and handle the equipment. The spraying is customarily done by work conveying backpack sprayer resulting more human exertion. The weeding is done by large finished with the assistance of Bulls progresses toward becoming for little land agriculturists. Agriculture has been the foundation of Indian economy. To satisfy the need of sustenance modernization of rural segment is critical. There are numerous zones in farming part where speed of modernization is slow. One of the fundamental areas is Agricultural multi sprayer. By modernization in this division water can be uniformly circulated on ranches which will reduce wastage of water. Presently day's a few advances are created and a few innovations are there in this field yet they are very little reasonable for Indian farming conditions.

**Key words:** - Usability, Functionality, Ergonomics, Wheel Driven, Multi Nozzle.

## INTRODUCTION

For an Indian economy the agriculture is basic structure. India being creating country farming and industries in view of agriculture product has prime significance in the national economy. Lion's share of the Indian population relies upon farming and agro-based ventures and organizations. The equipment is intended to play out the three activities to be specific Spraying. The outlet of the pump is associated with the sparying nozzle through adaptable pipe. A cutting plate is connected just underneath the store tank for the weeding reason. By utilizing a responding pump the fluid enters a pumping chamber by means of a gulf valve and is pushed out through an outlet valve by the activity of the cylinder or piston. The water powered spraying nozzle utilized as a part of the utilization of pesticides has a few capacities. One of its fundamental objects is to change over the spray arrangement into droplet for proficient target scope. A wheel is a circular segment that is planned to turn on a axial bearing. A crank is an arm appended at right edges to a rotating shaft by which responding movement is conferred to or gotten from the shaft. The belts are utilized to transmit control starting with one shaft then onto the next by methods for pulleys which turn at a similar speed or distinctive rates. To convert fluids by transforming the rotational kinetic energy with hydrodynamic fluid energy, the alternative pump is used.

## LITERATURE SURVEY

**1. Sandeep H. Poratkar, Dhanraj R. Raut (2013)**, the author presents a summary on the development of the multi-nozzle. Pesticides spray pump. The agricultural land in India is made up of small marginal, medium and rich farmers. The small-scale farmer of about 30% is used manually. Use of this sprayer cannot maintain the required uniform pressure. This leads to the problem of back pain. The suggested model has eliminated the problem of back pain, since it is not necessary to bring the tank (pesticide tank) in the back.

**2. Varikuti Vasantha Rao, et al(2013)**, the authors studies on the fertilizer sprayer given by different feeders. The layout and execution of multi-nozzle pesticide sprayers and the proposed structure is the two-sort out sprayer balanced with a gas engine that constrains the present inconveniences of the sprayer, for instance, working costs, fuel change, etc. replaced by an electric DC motor set away in the battery related with the unit, which is the authentic source of imperativeness to restrict regular degradation and agribusiness enhancement. Reasonable power source and cultivating are a triumphant blend. Wind, sun controlled and biomass imperativeness can be used continually, giving agriculturists a whole deal wellspring of pay. Inexhaustible power source can be used as

a piece of the association to supplant distinctive fills or can be sold as cash crops. It is among the most promising and basic open entryways for regard included things in agribusiness.

**3. Alaa Kamel Subr, et al(2015)**, the authors were examined on the practical deviation in the process of sustainable application of pesticides. The use of agrochemicals becomes an important practice for modern agriculture, but at the same time endangers human health, animals and the environment. Initial actions to create a balance between this negative impact and the need to use pesticides in relation to the environment, people's living conditions and the economy, these factors are defined as sustainable development. In this article, the calculation for obtaining the ability to sustain the pesticide.

**4. Shivaraja kumar, et al(2014)**, the authors were examined on the design and development of the wheel and pedal sprinkler. The equipment, which is a wheel and foot sprinkler, is a portable device and does not require any fuel to operate, which is easy to move and spray the pesticide by moving the wheel and also selling the equipment. In this equipment an alternative pump is used and an accumulator is provided for the continuous flow of liquid to create the pressure necessary for the spray action. This pesticide spraying equipment consumes less time and prevents the pesticide from reaching the front of the nozzles that come into contact with the person spraying the pesticides.

**5. Sumit D. Raut, et al(2014)**, The authors examined the design and construction of a reciprocal pump driven by a pedal that is used in a large irrigation project such as a garden and a drainage line. They drove different types of pumps and alternative devices were built and tested on different suction heads in the laboratory to evaluate their performance. The alternative foot pump can be available in local markets and simple skills are required to produce it. But this would be suitable for irrigating large fields and orchards, in particular for pumping water from a reservoir (capacity up to 15 liters) to irrigate small plots, such as vegetables and seedbeds, with less physical effort.

**6. Abhilash Gurjar, et al(2015)**, the authors were reviews on the solar sprinkler. The solar pulveriser is a suitable technology for its application in the agricultural sector. unity of India. The solar energy sprayer can be used as an alternative fuel device. It works according to the principle of photovoltaic solar energy (PV), with some modifications in the existing sprayer in the market. The annual cost of sprinkler maintenance should be around Rs.500 with an initial investment of Rs.5000 for the cost of the sprinkler. "Solar sprinklers" as "Alternative energy devices".

**7. Bibhu Santosh Behera, et al(2015)**, The authors were the comments on the application of solar energy for the application of agriculture in India. The Sun application has been established to highlight some points where the sprinkler

operator has to make subjective decisions about the correct procedure.

**8. Sanjay.S, et al(2015)**, the authors reviewed the design and manufacture of a mechanical pest sprayer. They designed an easy-to-use and fuel-free model for a user. In this model, we find that we simply use a pinion mounted on the rear axle that will operate the piston inside the cylinder in the tank. The group also consists of 4 wheels, 2 of which are mounted on the front axle and 2 mounted as a guide wheel on the rear. A pinion is mounted on the front side exactly at the end of the shaft. When pushing the carriage, the pinion rotates in its direction to activate the piston inside the cylinder, because this compression occurs inside the tank. Therefore, it sprays pesticides (or) water into the tank. Through our project, the spraying is done using the pinion mechanism. This project requires less work in sprinklers.

**9. Shailesh Malonde, et al(2016)**, the authors examined the design and development of the machine to spray multipurpose pesticides. Fumigation with pesticides is the necessary procedure in growing crops. The current idea is about the design and production of a pesticide sprayer that will be useful and convenient for farmers, which will help increase crop productivity. The authors concluded that the cost of sprayer was reduced compared to the existing sprayer, so this can be managed by small farmers. The flow rate is increased by 2.5 times the manual sprayer. The region sprayed per hour has been expanded by 2.6 times manually.

**10. Akhilesh K.Bhatkar, et al (2016)**, the authors surveys on the advancement of pesticide spraying machine agriculture is the foundation of indian economy. Agriculture is the backbone of Indian economy. This has to support 17 % of world population with only 2.3% percent of world's geographical area, 4.2 % of world's water resource, with 2 % total consumption of world's total pesticide. The need of nourishment modernization of rural part is critical and one of the primary segments is pesticide spraying machine. By appropriate utilization of pesticide to diminish wastage of yield preparations.

## CONCLUSION

It is an improved sprayer and bushcutter design that will be useful for small farmers. Consume less time and save money compared to conventional spraying and weeding. This machine does not require fuel or energy, so maintenance is lower. This model removes problem of back pain, vibrations and noise. This project can be used for the multiple crops. The model has provided multiple nozzles, which has continuous spray over crop and this process takes less time than other sprayers for spaying.

**REFERENCE**

[1] Sandeep H. Poratkar, Dhanraj R. Raut “Development of Multinozzle Pesticides Sprayer Pump” *International Journal of Modern Engineering Research (IJMER)* [www.ijmer.com](http://www.ijmer.com) Vol.3, Issue.2, March-April. 2013 pp-864-868 ISSN: 2249-664.

[2] Varikuti Vasantha Rao, Sharanakumar Mathapati , Dr. Basavaraj Amarapur, “ Multiple Power supplied Fertilizer sprayer” , *International Journal of Scientific and Research Publications, Volume 3, Issue 8, August 2013 1* ISSN 2250-3153.

[3] Shivaraja kumar, Parameswaramurthy. D “Design and Development Of Wheel and pedal Operated Sprayer” *International Journal of Mechanical Engineering (IJME)* Volume 2, Issue 6, June 2014 ISSN 2321-6441.

[4] Sumit D. Raut, Kamlesh R. Banarse,Roshan R. More, “Fabrication of Pedal Operated Reciprocating Pesticide Sprayer for Agricultural and Drainage Line Use” *International journal of pure and applied research in engineering and technology*, 2014, Volume 2 (9), 67-74 ISSN: 2319-507X.

[5] Abhilash Gurjar, Riyaz Mansuri, Sanjay Baghel, Kaustubh Kawale, “ Solar Powered Sprayer” *international journal for engineering applications and technology*, volume 2015, Issn: 2321-8134.

[6] Bibhu Santosh Behera, Rudra Ashish Behera and Anama Charan Behera, “ Solar Energy Applications for Agriculture in India” *International Journal of Energy, Sustainability and Environmental Engineering Vol. 1 (3), January 2015*, pp.107-110.

[7] Shailesh Malonde , Shubham Kathwate ,Pratik Kolhe Roadney Jacob ,Nishat Ingole ,Rupesh D. Khorgade “Design and Development of Multipurpose Pesticides Spraying Machine” *Journal of Advanced Engineering and Global Technology* ISSN No: 2309-4893 Vol-04, Issue-03, May 2016.

[8] Akhilesh K.Bhatkar, P. B. Khope, P. S. Chaudhari, “Development Of Pesticide Spraying Machine” *International Journal of Research inEngineering and Technology* ICESMART-2016 May-2016,eISSN: 2319-1163 pISSN:2321-7308 .