

Design And Fabrication of Agricultural Vehicle – Pesticide Sprayer And Ploughing

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Abstract- Day by day the population of India is increasing and to fulfill the need of food modernization of agricultural sectors are important. Due to chemical fertilizers the fertility of soil is decreasing. Hence farmers are attracted towards organic farming. By mechanization in spraying devices fertilizers and pesticides are distributed equally on the farm and reduce the quantity of waste, which results in prevention of losses and wastage of input applied to farm. It will reduce the cost of production. It will reduce the cost of production. Mechanization gives higher productivity in minimum input. Farmers are using same traditional methods for spraying fertilizers and pesticides. As India is a agriculture based country and 70% people do forming and related work. Agriculture is required to be boomed to enhance the Gross Domestic Product (GDP) of the country by improving the productivity. The productivity of the crops can be increased with the help of pest control. The present idea deals with the designing and fabrication a pesticide sprayer which will be useful and affordable to the farmers which will increase the productivity of crops. So we have designed a pesticide spraying machine which will not only increase productivity but also reduce the efforts of the farmers. The machine will save the farmer time and as well as efficiency in spraying. This model used lots of time and affects human health adversely.

I. INTRODUCTION

Insects are largely responsible for the crop destruction. Insecticides or pesticides, a man made or natural preparation are used to kill insects or otherwise control their reproduction. 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. There are many advantage of using sprayers such as easy to operate, maintain and handle, it facilitates uniform spread of the chemicals, capable of throwing chemicals at the desired level, precision made nozzle

tip for adjustable stream and doing capable of throwing foggy spray, light or heavy spray, depending on requirement.

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 formers are desperately seeking different ways to improve the equipment quality while reducing the direct overhead cost(labour) and capital. Thus, a significant opportunity rests with understanding the impact of a pesticides prayer in an agriculture field. A pesticide sprayer has to 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 sprayer introduced in the market but these devices do not meet the above problems or demands of the farmers.

The conventional sprayer having the difficulties such as it needs lot of effort to push the liver up and down in order to create the pressure to spray. Another difficulty of petrol sprayers to need to purchase the fuel which increases the running cost of the sprayer. In order to overcome these difficulties. We 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. The mechanism involved in this sprayer is reciprocating pump, and nozzles which were connected at the front end of the spraying equipment accomplished by forcing the spray mixture through as pray nozzle under pressure.

PESTICIDE SPRAYING MACHINE Spraying techniques are commonly divided as high volume (HV), low volume (LV), and ultra low volume (UVL), according to total volume of liquid mixture applied per unit of ground area. And according to spraying techniques pesticide spraying machines are developed to get required output.

Hand Operated Back-pack Sprayer Hand operated back-pack sprayer applicators are generally used to apply small quantities of pesticides both inside structures such as greenhouses or for small jobs outdoors such as on small farms or spot treatment on larger farms. This sprayer consist a nozzle

to spray out the pesticide. Hand operated back-pack sprayers usually have an air pump which compresses air into the tanks and pressurizes the spray mixture.

Air blast Sprayer

Air blast sprayers direct the spray mixture from the nozzles into an air stream which transports the spray droplets to the target. Air blast sprayers have a powered fan which forces air through an opening to generate high air speeds. Often the opening or manifold can be adjusted to ensure that the air stream is directed at the target. These sprayers are also used in other commodities such as grapes, blueberries and nursery crops among others.



Fig. 1 Air blast sprayer

PLOUGHING: A plough or plow is an agricultural implement which is used to cut the soil and make it suitable for the process is called seed sowing.

Before sowing the seeds into the field, it is paramount to make the field suitable to accomplish this, different types of ploughs are used nowadays.

A plough inside out today when I was 14 years old, I went with my father to the field and saw many types of new tools. We will today discuss about an important agriculture equipment which cannot be ignored.

Types of ploughs There are different types of ploughs available to match various types of soil structures. These different types are listed below:

1. Mould board plough
2. Disc type plough
3. Rotary plough
4. Chisel or sub surface plough
5. Sub soiler plough

II. LITERATURE REVIEW

Pavan B. Wayzode et.al (2016): In this work an equipment that is wheel and pedal operated 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 and also peddling the equipment. In this equipment using reciprocating pump and there is an accumulator provided for the continuous flows of liquid to create necessary pressure for the spraying action. This wheel operated pesticide spray equipment consumes less time and avoids the pesticide from coming from front of the nozzles which will be in contact of the person who sprays pesticides. Weed management is one of the tedious operations in crop production. Because of labor costs, time and fully manual weeding is unfavorable. Hence effort is made to design and develop efficient farm equipment to perform weeding without using electric power.

Dr. S K Chaudary et.al (2015): Day by day the population of India is increasing and to fulfill the need of food modernization of agricultural sectors are important. Due to chemical fertilizers the fertility of soil is decreasing. Hence farmers are attracted towards organic farming. By mechanization in spraying devices fertilizers and pesticides are distributed equally on the farm and reduce the quantity of waste, which results in prevention of losses and wastage of input applied to farm. It will reduce the cost of production. It will reduce the cost of production. Mechanization gives higher productivity in minimum input. Farmers are using same traditional methods for spraying fertilizers and pesticides. Equipment is also the same for ages. In India there is a large development in industrial sectors compared to agricultural sectors. Conventionally the spraying is done by labors carrying backpack sprayer and fertilizers are sprayed manually. The efforts required are more and beneficial by farmers having small farming land.

R.D. Gorle et.al (2016): With the help of this machine farmer spray pesticides in their farm, but it requires lot of time and thus high operational cost. Also, the farmer which is spraying pesticides is affected by it as it is harmful to human health and human also affect by the lumbar pain due to weight of equipment. This method used lots of time and affects human health adversely. This paper suggests machines which will save time and operational cost. Also saves human from affecting adversely.

III. METHODOLOGY

Detailed Description of the model It consists of the following parts 1. Handle for controlling 2. Reciprocating pump These types of pump operate by using a reciprocating

piston. The liquid enters a pumping chamber via an inlet valve and is pushed out via an outlet valve by the action of the piston or diaphragm. Reciprocating pumps are generally very efficient and are suitable for very high heads at low flows. This type of pump is self priming as it can draw liquid from a level below the suction flange even if the suction pipe is not evacuated. The pump delivers reliable discharge flows.

3.Nozzle The nozzle is a critical part of any sprayer. Nozzles perform three functions: 1. Regulate flow. 2. Atomize the mixture into droplets. 3. Disperse the spray in a desirable pattern.

Weed cutter plate Weeding is the process of eliminating the competition of unwanted plants to the regular crops so that crops can be grown profitably. Management of weeds is an important component of production techniques as elimination of weeds is expensive and hard to achieve. Weeds are uprooted by the teeth of the weeder and buried in the mud by push and pull operations of the weeder.

COMPLETE PROPOSED MODEL



Fig 2: complete proposed model

IV. CONCLUSIONS

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.

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