Agricultural Sprayers - A Review

Albert Francis A[1], Mohana krishnan A[2], Rajaram S[3]
[1] Dept of Mechanical Engineering
[2, 3] Assistant professor, Dept of Mechanical Engineering
[1, 2, 3] K.Ramakrishnan College Of Engineering,Tiruchirappalli,Tamilnadu,India-621112.

Abstract- *The effective paper relates the various types of energy source used for the fertilizer spraying technique.The simplified paper is anyone can easy to understand the agricultural spraying technique and the basic principle involved in the sprayers.The recent advancements are to reduce the effort of human being in the spraying time.These kind of machines has uniform distribution and it is also increase the productivity of the field.The population growth is the main causing demand in food problems.These ancient and advanced machines are increase the overall productivity with the minimum source.In most of the sprayers has rotary motion is to convert into reciprocating movement of the piston and gradually pressure is created and it is deliver through the discharge nozzle.*

Keywords- Agriculture,piston,nozzle,spray,fertilizer.

I. INTRODUCTION

Agriculture is an art.The agricultural products are most important to living species.So it can be concerned that the various technique of cultivation and preparation processes are helpful to attain our aims.Agriculture is mainly depends on the weather condition,water source,quality of seed,soil condition and fertilizer used.The weather condition can not be controlled by the manpower.But the fertilizer spreading is possible for any time.The fertilizers are increase the productivity of the food items and it is fulfills the human and animal needs.The solid fertilizers can be spread only in manpower and the type of solid fertilizer spreading technique is varied depending upon the plant condition.So there is no special machines are available to spread the solid fertilizer.But the liquid fertilizer can be done to spray on various types of methods and it is help to the plant growth.

II. TYPES

2.1. Manual Powered

2.1.1. Backpack sprayer

The hand powered sprayers are also called as Backpack sprayer.The sprayers are work in the source of manpower.The right hand is to control the flow of spray and the left hand is partially rotate the connecting rod.The connecting rod is directly coupled with the reciprocating piston.The handle top to bottom direction has the pressure created in the inside pressure cup with the help of reciprocating piston.The right handle valve is provided for control the velocity of flow at the delivery nozzle.

In the manual operate sprayers are attached with the cycle.The pedal movement is directly connected to the reciprocating piston.The number of nozzles are increased when the flow of fertilizer is maximum when compared to the Backpack sprayer.The cycle operated sprayers are only capable to spray in smooth surface only and not suitable for wet surfaces.

Fig 2.1.1.1 Backpack sprayer

2.1.2. wheel operated

[4]The wheel operated sprayer has the bike rear axle shaft is connected to the sprayer design axle and it is connected to the reciprocating piston.The chain drive provided for transmission purpose of the rotary motion into reciprocating movement.

Fig 2.1.2.1 wheel operated sprayer

2.1.3. Mechanical operated cart

[1]The mechanically operated sprayer has the slider crank mechanism is used for the piston reciprocating purpose.The design of sprayer has the cart is provided for alternative source of manpower.The wheel axle is directly coupled with the reciprocating connecting rod.The movement of the design is only for manpower.

Fig 2.1.3.1 Mechanical operated cart

2.2.Battery operated

2.2.1. Rechargeable sprayers

The rechargeable sprayers are advancement of Backpack sprayer.Because the ancient modern sprayers has need for more human effort and the time consumption is more.The problems can be reduced that batteries are provider for the spraying purpose.The motor and mini air compressor is provided for supply the constant fertilizer flow is possible.

Fig 2.2.1.1 Rechargeable sprayers

2.2.2. Solar powered sprayers

The solar powered sprayers are used to absorb the maximum amount of sunlight by using solar panels and in this power is stored in a battery.The battery will supply the power for the motor and air compressor.The solar energy is non polluted renewable energy source in the world.In the kind of sprayers there is no emission is possible.The range of power supply is directly depends on the area of the solar panel and battery capacity.

2.2.3. solar power in backpack

The normal backpack sprayer is simply modified in the design.In which the solar panels are collect the solar radiation and it is convert into electricity in the principle of photo voltaic effect.The power is stored in a lead acid battery and it is supplied to the motor.The solar panel selection is most important for the constant power supply.

Fig 2.2.2.1 Solar powered sprayers

2.3.Fuel power

2.3.1. Fuel powered sprayers

The fuel power sprayers are the main components of air compressor,petrol engine and the tank.The fuel is supplied to the engine and the power is fully supported to the air compressor.The liquid fertilizer is automatically discharged

without any external sources.Because the tank is placed at the top of the setup.The right side square shape control valve is provided for increase and decrease the discharge of fertilizer.

Fig 2.3.1.1 Fuel powered sprayer

2.3.2. Aerial sprayer

The aerial sprayers will spray the fertilizer in above the certain distance from the ground level.It is one of the type of flying sprayers.The total setup of the cost is maximum and it is not suitable for rural area agricultural farmers.

Fig 2.3.2.1 Aerial sprayer

2.3.3. bike mounted sprayer

In the vehicle is mounted with the tank,air compressor and number of discharge nozzles.The source of air compressor is a vehicle and the vehicle also supply the sufficient power for all the times.

Vehicle mounted mechanical operated

[2]The front and rear axle is provided for the direction control purpose.The spur gear is connected to the front axle and the pit man arm is provided for linkage to reciprocate the piston.The tank is placed intermediate between the two wheels.The rotary movement of the wheel is directly convert into reciprocating motion of the piston.

Fig 2.3.3.1 bike mounted sprayer

2.3.4.cycle operated

[5]The design consist of three wheels and the front wheel for direction control.The rear two wheels are provided for transmitting the rotary motion of the wheel into reciprocating movement of the wheel.

2.3.4.cycle operated sprayer

V. CONCLUSION

The above mentioned type of sprayers are very useful to increase the productivity of the field of agriculture.These kind of sprayers are reduce the human effort for the spraying time and the uniform spreading is possible for every plants.In the manual, renewable and battery operated sprayers are friendly to the environment and not affected by the surrounding.

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