

AGRICULTURE THREE IN ONE MECHANISM SYSTEM

Pagar Sagar¹, Patil Gajanan², Ratnaparkhi Saurabh³, Pawar Vikas⁴, Patil Tushar⁵

¹ Student, Mechanical Engineering, Matoshri College Of Engg, Maharashtra, India

² Student, Mechanical Engineering, Matoshri College Of Engg, Maharashtra, India

³ Student, Mechanical Engineering, Matoshri College Of Engg, Maharashtra, India

⁴ Student, Mechanical Engineering, Matoshri College Of Engg, Maharashtra, India

⁵ Asst. Prof Mechanical Engineering, Matoshri College Of Engg, Maharashtra, India

ABSTRACT

Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. Agriculture is a branch of applied science. Agriculture is the science and art of farming including cultivating the soil, producing crops. These systems are bulkier in size and more individual cost and it not possible to buy every system by farmer. For this problem solution we are decided to combine these three main system in one system to reduce cost and the different agriculture equipment's are combined and work together efficiently with reducing the manufacturing cost which will be in affordable budget. We have developed agriculture three in one new mechanical project. This project provides farmer three needs solution cropping, spraying, dust ring. Utilization of solar energy and it is converted into the chemical energy, which is used to drive the different units of the system.

Keyword: - Spray, Duster, Cutter, solar Panel and Battery

1. INTRODUCTION

Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. A man without food for three days will quarrel, for a week will fight and for a month or so will die. Agriculture is a branch of applied science. Agriculture is the science and art of farming including cultivating the soil, producing crops and raising livestock. We have developed agriculture three in one new R&D mechanical project. This project provides farmer three needs solution cropping, spraying, dust ring. Three different mechanisms which are more useful to farmer and they need these mechanisms in daily routine work. For the farmer convenient we developed this three mechanism in one system in compact, less expensive and comfortable used. We have developed agriculture duster which is new R&D mechanical project. It is a common type of duster being used by the farmers. The duster consists of a hopper, fan/blower, rigid/flexible discharge pipe, reduction gearbox, rotating shaft to connect motor, and metering mechanism. The duster has mechanical agitator connected to the gearbox placed in the motor, which chums the chemical and prevent clogging of the outlet. The adjustable orifice plate mounted below the hopper outlet controls the application rate. For operation, the hopper is filled 1/2 to 3/4th of the capacity of the hopper. This is mounted on the frame work with the help of adjustable straps. The discharge pipe fitted with spoon type deflector is directed towards the target continuously rotating the switch on motor. The chemical in dust/powder form drops from the hopper in the discharge pipe having an air stream created by the blower. These dust particles emerging in, the forms of cloud from the discharge pipe are carried to the plant where these settle on the leaves, stems and other parts.

1.1 Problem Statement

The most common difficulties observed in farming that the cost of equipment's likes dusting machine cutting machine, and spraying machine. The convectional equipment's used, required the fuel for their working, this increase the maintenance of the equipment. The spraying machine is the most important due to which the price is increasing, it is operated with the help of diesel machine means it will not be able to operate without the electricity or the diesel machine. The pollution is caused by the convectional equipment's is high. Cutting the grass in the farm field requires numbers of labors which are quite difficult, the charges to be pay are increasing day by day which cannot be affordable for the poor farmer and work are not done in time. The convectional dusting machine is very costly and it works on the tractor machine.

1.2 Objective

1. To reduce machine cost.
2. To be more suitable for material handling system.
3. To be more compact and easy to operate.
4. To reduce fuel cost and pollution.

2. LITERATURE REVIEW

1] **Sanket Zanwar, Qureshi Azmat, Shaikh Aleem, Khan Imran** gave an idea regarding problems like power shortage. In order to avoid or overcome this problem it is planned to make a device which work on solar energy.

2] **Gare N. B., Devkar G. R. Deshmukh M. B., Garud Y. R. Prof. Baviskar A. C, Prof. Bhane A. B** gave knowledge about utilization of solar energy which is used to drive the different units of the system. The different agriculture equipment's are combined and work together efficiently with reducing the manufacturing cost which will be in affordable budget.

3] **P.Amrutesh, B.Sagar, B.Venu** gave an idea about grass cutting which is the machine that uses sliding blade to cut lawn at an even length even more sophisticated device are there in every field. Power consumption becomes essential for further.

3. SYSTEM COMPONENT

This system consist main three components as follows-

1. Duster
2. Sprayer
3. Cutter

Also the other supplementary parts of this system are pump, solar panel, battery, nozzle, hopper, stepper motor, wiper motor and the all parts are assembled on a frame.

4. WORKING OF DIFFERENT SYSTEMS

4.1 Dusting System

This duster is fabricated at our state-of-the-art enterprise using high grade components under the guidance of skilled technocrats as per the international standards. Hand Rotary Duster is widely used in the agriculture sector due to its high performance, reliability, sturdy construction, less maintenance, corrosion resistance and longer service life. It is available in different capacities at market leading prices as per the needs of the clients. Function: For control of pests and diseases by use of chemicals in the dust forms in nursery, vegetable gardens, field crops, tea and coffee plantations, green houses, glasshouses. The duster consists of a hopper, fan/blower, rigid/flexible discharge pipe, reduction gearbox, rotating handle, shoulder straps, and metering mechanism. The duster has mechanical agitator connected to the gearbox placed in the hopper, which chums the chemical and prevent clogging of the outlet. The adjustable orifice plate mounted below the hopper outlet controls the application rate. For operation, the hopper is filled 1/2 to 3/4th of the capacity of the hopper. The chemical in dust/powder form drops from the hopper in the discharge pipe having an air stream created by the blower. These dust particles emerging in,

the forms of cloud from the discharge pipe are carried to the plant where these settle on the leaves, stems and other parts.



Fig-1: Duster

4.2 Spraying System

This small, high volume, 12v fluid circulation pump is very well suited for circulating water. A spray nozzle is a precision device that facilitates dispersion of liquid into a spray. Nozzles are used for three purposes: to distribute a liquid over an area, to increase liquid surface area, and create impact force on a solid surface. A wide variety of spray nozzle applications use a number of spray characteristics to describe the spray. Spray nozzles can be categorized based on the energy input used to cause atomization, the breakup of the fluid into drops. Spray nozzles can have one or more outlets; a multiple outlet nozzle is known as a compound nozzle.

The solar energy is trapped with the help of solar plate this energy is stored in the battery. When the on off switch is on at that time the power is given to the centrifugal pump the pump get operated it pumps the fluid from the fluid tank this fluid is passed through the tube towards the nozzle where the nozzle will spray the fluid uniformly over the plant. We can use this machine as a drenching machine by removing the nozzle, as per requirement in the farm field. The 12-volt dc motor is used to adjust the angle of spraying machine as per operation to be performed.

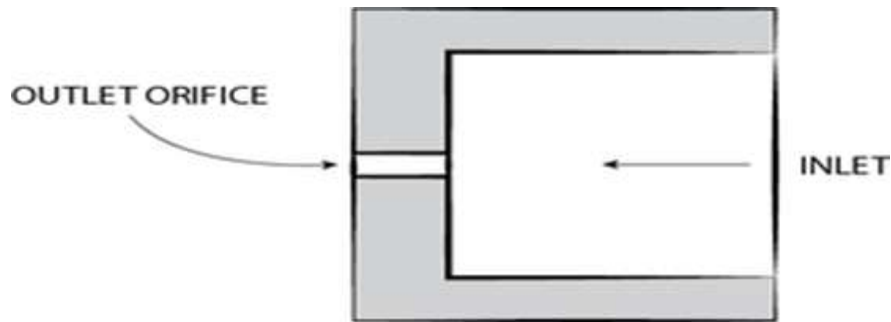


Fig-2: Orifice Spray Nozzle

4.3 Cutting System

A grass cutter (also called a brush saw or clearing saw) is a powered garden or agricultural tool used to trim weeds, small trees, and other foliage not accessible by a lawn mower or rotary mower. Various blades or trimmer heads can be attached to the machine for specific applications.

It consists of:

1. A power unit held close to the body.
2. A pole through which the power is transmitted.
3. A rotary cutting head at the opposite end of the pole to the power unit.

If you live in a home with a yard, you probably use at least one kind of grass cutter to keep your yard looking tidy. Grass cutters have different intended uses and come in many types and sizes, but they all have roughly the same use: to keep the grass trimmed. Whatever your grass-cutting needs, a tool stands ready to help you do it. Choosing the right grass cutter for the task makes the work easier and leads to satisfying results. The cutting machine is attached to the motor, when the supply is given to motor, motor start running due to which the cutting machine starts. The grass is trapped in the cutting blades because of this the grass is being cut.



Fig-3: Cutter

4.4 Agriculture Three in One Setup



Fig-4: Agriculture Three in One Setup

5. ADVANTAGES

1. The machine has very low error.
2. The size of project made by is more suitable for material handling system.
3. The cost of machine is less.
4. It is easy to make.
5. It has low maintenance.
6. The system has worked fully solar battery operated.
7. Size of machine is small therefore it is easy to transport.
8. Weight of machine is less.

6. DISADVANTAGES

1. Being semiautomatic we cannot neglect at least one operator.
2. Battery is most important for duster and water pump operated

7. FUTURE SCOPE

By increasing the equipment strength and quality to its peak, we can have multipurpose agricultural equipment for life time usage. In future we can use robotics application due to which less effort will required and human intervention wills completely eliminated productivity will increase.

8. APPLICATION

1. It is used in agriculture.
2. It is used in gardening purpose.
3. Used in farming in small areas.

9. CONCLUSION

In this way we conclude that, the different operation can be performed at a time without polluting the environment and by using the non-convectional power source, we had tried to reducing the manufacturing cost which will be in affordable budget, due to its multipurpose task, this cutter is totally Eco -friendly and is so useful

to the people for multipurpose also. The cost of the system is reduced because the use of solar energy in the replacement of the conventional fuel energy.

10. REFERENCES

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