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# Battery drive motorized agriculture weeder

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# ABSTRACT

Motorized agriculture weeding machine not only uproots the weeds between the crops rows but also keeps the soil surface loose, ensuring better soil aeration and water intake capacity. Weed management is an ever-present challenge to crop production. Weeding by motorized Weeder reduces the cost of labour and also saves time. In human operated Weeder, muscle power is required and so it cannot be operated for long time. The traditional method of hand weeding is time consuming. In this Battery drive motorized weeder we use motorized system, which is powered by battery. India is an agricultural country. But traditional farming techniques are being replaced by modern techniques which use advanced machines in very simple manner. Weeding machine (weeder) is also one of them. The weeder is used for removing weeds in vegetable gardens, basins of orchard trees and Vineyard plantations. In this work our team make agricultural equipment which is useful for farmer, this equipment is known as Battery Drive Motorized Agriculture Weeder.

Keywords: Weeder machine, Modern techniques, DC Motor & Battery.

# **INTRODUCTION**

Agriculture is the backbone of India, and weed removal being one of the primary processes in the field, there is a necessity for weed to be removed in all the fields to increase the quality of crops and to decrease the effect of weeds on crops. A weed may also be defined as any plant growing where it is not wanted. . The weeder is agricultural equipment which is employed in the removal of weed.

A weeder is any of several types of farm implement used for secondary tillage. For example, a plant may be valuable or useful in a garden, or on a farm or plantation – but if the same plant is growing where it reduces the value of agricultural produce or spoils aesthetic or environmental values, then it is considered a weed. Common ways for controlling weeds include mechanical, chemical, biological and agronomical ones. Presently, there are many types of weeders available from simple to complex and motorized weeders. Several innovative and cost effective designs were developed and experimented according to the requirements of the farmers and soil conditions. Efforts are still on to reduce the drudgery in weeding operation Mechanical control, which is performed by hand and mechanical weeder have specific importance from agronomical and conformity with environmental condition points of view. Depending on weed density and species in the field, labour requirement for weeding varied between 10 to 15 persons per hectare in paddy fields.

The drawbacks include-The engine causes high vibrations, noise this could result in number of health problems. Due to heavy weight back pain causes. The tractor mounted sprayers are very expensive, not useful for small space and all type of crop. It is suitable for heighted crop in large amounts.

# LITERATURE REVIEW

In recent year the study about this battery drive motorized weeder has recognized to be more

useful and efficient for farmers. [1] Studied about the efficiency of weeder should be satisfactory and it is easy to operate. It was faster than the traditional method of removing weed. Less labour needed and it is more economical than hand weeding. Here do not use any fuel and power, Hence maintenance cost is very less.

Studied the gearbox has a 2forwardand 1reverse gear arrangement. The battery source is given to the motor for drive. A lead-acid battery setup with 4numbers each of 12v capacity is used. The operating life of the battery is around 200-300 recharge cycles. But it can't work for long time [2]. Studied the previous design of machines consumes maximum amount of fuel. It can be reduced that various innovators are designing the solar powered machines [3]. The climatic condition also affects the performance. [4] In agriculture sector33 percent cost of cultivation is spent on weeding alone when carried out with the manual labour. Complicated operation of weeding is usually performed manually with the use of traditional hand tools in upright bending posture, inducing back pain for majority of labours.

Presently, there are many types of weeders available from simple to complex and motorized

weeders [5]. Several innovative and cost effective designs were developed and experimented according to the requirements of the farmers and soil conditions. Efforts are still on to reduce the drudgery in weeding operation.

# **PROBLEM IDENTIFICATION**

Weeds are mostly removed from the field in a manual process as they are seen more as a negative factor for crop growth due to the unskilled workers. Usage Fuel engine cause high vibrations, noise this could result in number of health problems. Due to heavy weight back pain causes. The tractor mounted not useful for small space and all type of crop [6].

Mechanical weeding is preferred to chemical weeding because weed application is generally expensive, hazardous and selective. Besides, mechanical weeding keeps the soil surface loose by producing soil mulch which results in better aeration and moisture conservation Uses of fuel engine may leads to pollution and fuel consumption is high. So, we can use this "Battery Drive Motorized Weeder" to solve the problems discussed above [7].

# **METHODOLOGY**



#### **Fig.1 Flowchart**

Indian farmers use traditional method, there is large scope for development in agricultural sector. In traditional method weeding process are done by the bull which become costly for farmers having small farming land its time consuming and requires separate setup. The weeder is used to reduce the human efforts. It is very useful device for farming. It helps the famer to reduce their efforts and get efficient work done. The weeder is operated by battery hence it become portable & handy. The hands of weeder are attached to the motor using nut-bolts& metal plates. When motor runs it rotates its arm which can dig purpose. In Battery drive motorized weeder we use motorized system, which is powered by battery in a particular arrangement to automate this task [8].

power motor, couplings, mounts and joints, screws, wheels and rods, battery, handles.

# DESIGN

It consists of connector arms to stimulate digging motion. This system is made up of high-



**Fig.2 Front View** 



Fig.3 Side view



**Fig.4** Top View

# **DESIGN REQUIREMENTS**

#### **Battery**

The battery used is lead acid battery. It provides the necessary power to drive the motor,

and the battery acts as the power source for the machine. Lead acid batteries are more affordable and have a better efficiency of about 80-85%.



**Fig.5 Battery** 

The motor provides the drive necessary for the displacement of the machine. Motor is mounted on the front of the machine along with a controller for motion and control. They rated maximum speed of motor at no load condition.

electrical power is converted into mechanical power. Most often, this type of motor relies on forces that magnetic fields produce. DC motors have some kind of internal mechanism, which is electronic or electromechanical [9].

### **D.C Motor**

A 12V DC motor is any motor within a class of electrical machines whereby direct current



Fig.6 Dc Motor

In both cases, the direction of current flow in part of the motor is changed periodically. This

motor provides necessary power required to drive the battery drive motorized weeder.

## Frame



Fig.7 Frame

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Main frame is the skeletal structure of the machine. It acts as the chassis for the system. All the loads applied are frame. Components and attachments are affixed and give support main frame for support and balance. This frame is made up of Mild Steel for the better strength and to carry the overall weight of the weeder [10].

#### **PWM Controller**

Pulse Width Modulation (PWM) is a nifty current control technique that enables you to

control the speed of motors, heat output of heaters, and much more in an energy-efficient. Pulse width modulation speed control works by driving the motor with a series of "ON-OFF" pulses and varying the duty cycle, the fraction of time that the output voltage is "ON" compared to when it is "OFF", of the pulses while keeping the frequency constant.



Fig.8 PWM Controller

Pulse Width Modulation (PWM) Signal is a method for generating an analog signal using a digital source. PWM signals are used for a wide variety of control applications. Their main use is for controlling DC motors.

### Solar Panel

The renewable energy in the form of sunlight was absorbed by the solar panel which converts that light into electricity to provide power for electrical loads. This panel is mounted on the frame with help of supporting structures shown.



**Fig.9 Solar Panel** 

A solar module or PV module is packaged; series connected many individual solar cells. A

single solar cell cannot produce required power output so multiple solar cells are installed in a module to get required output. A PV module is an assembly of photo-voltaic cells mounted in a frame work for installation. Photo-voltaic cells use sunlight as a source of energy and generate direct current electricity. A collection of PV modules is called a PV Panel.

# RESULT

Based on the overall performance of the machine we can also project will satisfy the need of small scale farmer, because they are not able to purchase costly agricultural equipment. The machine required less man power and less time compare methods, so if we manufacture it on a large scale its cost gets a hope this will satisfy the partial thrust of Indian agriculture. So in this way we can solve the labour problem that is the need of today.

Most of the machines are large in size not affordable for medium and small scale farmers. Weed removal by mechanical method is one the methods frequently used these to remove weeds from the agricultural fields. Research has been conducted on economical methods for weed removal without damaging the crops.

In this larger area can be covered in shorter time. Deep rooted weeds can be controlled effectively. Weeding with the use of tools like cutlass and hoe requires high labour force in a commercial farming system hence motorized battery weeder is necessary to reduce the labour force. It is pollution free when compare to the engine operated weeder.

### CONCLUSION

Battery power weeder has been successfully implemented for the removal of weeds in crops and can definitely say that the project will satisfy the need of small scale farmer, because they are not able to purchase costly agricultural equipment.

Agricultural development plays important role as a driver of rural poverty reduction. The effort require to develop a weeder will meet the demand of farmers. The efficiency of weeder should be satisfactory and it is easy to operate. It was faster than the traditional method of removing weed. Less labor needed and it is more economical than hand weeding. Here we do not use any fuel This Project will help people to understand the relevance of mechanized weeding, which is not a huge time consuming and significantly improves weeding efficiency as well as the quality of weeding.

This work is executed with an idea to achieve an effective solution to the weed control. The designed equipment is safe to use and ecofriendly. Single operator can operate this machine to weed out the plants. Labour requirement and fuel charges are greatly reduced by this weeder.

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