

## “FABRICATION OF POWER WEEDER”

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**Abstract** - A weeder is a machine used in agricultural fields to remove the weeds, which are unnecessary crops that hinder the growth of crops. The weeder which is operated with the gasoline engine is called a power weeder. The power weeder has the problem of pollution and excess vibration. To overcome these issues the power weeder is to be converted to an electrically operated system. So here the existing 2 stroke gasoline engine is used for power source. For doing fieldwork maximum human power is used, but some present year's needs of workers are necessary but availability of workers is less for field work. The weeder driven by man to move in forward direction and the weeder tool is attached at front end is placed at the roots of weeds, once the tool get pushed then it starts cutting the weed, like this the complete land of cultivation is made as weed free.

**Key Words:** Weeder Machine, Agriculture, Weed Cutter, Petrol Engine, 2 stroke engine.

### 1. 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. Weeds are the most rigid and excessive biological constraint to crop production, and it cause viewless damage till the crop is harvested.

The compositions of weeds are dependent on soil, climate, cropping and management factors. Due to migration of labors from village to cities, the labors to work at field is varying unlikely and at the same time not much of the technology advancement is present in farming. To overcome these challenges, this project deals with development of a weeder.

India is set to be an agricultural based country; approximately 75% of population of India is dependent on farming directly or indirectly. Our farmers are using the same methods and equipment for the ages for example seed sowing, spraying, weeding etc. As per demand by consumers is high quality food products and pay special attention to food safety. More specifically, in crops like

soyabean, maize, gram there is no any power operated mechanical weed control method is available. Therefore, there is a need to have a low cost weeder for small and medium farmers. In view of above, the present study is proposed to design and develop a power-operated rotary weeder for crops.

### 1.1 PROBLEM IDENTIFICATION

Weed removal is one of the major activities in agriculture. Chemical method of weed control is more prominent than manual and mechanical methods. However, its adverse effects on the environment are making farmers to consider and accept mechanical methods of weed control. Chemical weeding is the most extensively used method of weed removal but these chemicals used for weeding are harmful to living organisms and toxic in nature. Hence there is need of innovative physical weed control strategies. Mechanical and thermal means were used to control weeds and removal by mechanical method is one the methods frequently used these to remove weeds from the agricultural fields.

This research has been carried out to use some combination of various methods of weeding. Research has been conducted on economical methods for weed removal without damaging the crops.

### 1.2 EXISTING METHOD

A weed may be defined as any plant or vegetation that interferes with the objectives of farming or forestry, such as growing crops, grazing animals or cultivating forest plantations. A weed may also be defined as any plant growing where it is not wanted. 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. As we know controlling weed is most important in agriculture for better yield.

There are different types of methods available for the weeding such as preventive method of weed control, Biological method of weed control, Chemical method of weed control, Cultural method etc. All these methods are time consuming and costly in nature. So, we invented a Petrol engine operated Power Weeder which is very easy to use and it also work faster as compare to other methods.

**2. OBJECTIVE**

The objective of the project is to design, construct and test the weeder, to provide the best opportunity to farmer’s to easily control and removing the weed from farm. Weeding with the use of tools like cutlass and hoe requires high labor force in a commercial farming system hence mechanical weeder is necessary to reduce the labor force.

Presently in India, weeding with simple tools such as cutlass, hoe etc. is labor intensive and time consuming. Thus, there is a need for the design of manually operated weeder for intensive and commercial farming system in India. For this study we have developed a power weeder.

**3. CONSTRUCTION OF WEEDER MACHINE**

Assembly of machine consist the mounting of engine on the frame & chassis is mounted on wheel. Then the engine is assembled on chassis by using nut, bolt & somewhere by weld as required. Manufacturing of motor includes following procedure. Weeding tool is cut by grinding cutter & bending of the tool is done manually. This tool is attached with the frame by adjusting setting.

A single wheel is fitted below the chassis with the help of nut & bolt. Round pipe is used for the handles with required dimensions & switch is fitted on handle & directly connected to the engine by using wire. Switch & other connections are made for on/off the engine & Switch is mounted on handle of machine.

**3.1 Components Used**

For construction of the weeder machine there are various components are used which are as listed below:

**A. Two Stroke Petrol Engine**

In fabrication of power weeder, engine is the most important component. For this project we used a 2 stroke petrol engine. The figure of the engine is shown below:



Fig.1: Two Stroke Petrol Engine

Petrol engines takes in a mixture of air and petrol and compress to less than 1275kpa and use a spark plug to ignite the mixture when it is compressed by the piston head in each cylinder.

**B. Weeder Tool**

The figure of the weeder tool used in fabrication of the power weeder is shown below:



Fig. 2: Weeder Tool

The weeder tool which is used for the fabrication of the power weeder is made from mild steel having standard size length 203.2 mm of and width of 25.4 mm is assembled on chassis by using lock nut and bolts and somewhere by welding as per requirement. Lock nuts and bolts having size equal to 10 mm diameter of hexagonal head are used for assembling the blade on disc. The main purpose of using lock nuts is to avoid slippage during working of machine.

### C. Chassis Frame

Chassis is constructed from angles made up of mild steel which are cut as required length and are then welded together with the help of welding torch (Arc welding). Chassis act as a load carrying part and mounting for all the parts of machine including engine, wheels, transmission system, tools, etc. It keeps all the part assembled together.

### D. Shaft & Chain

Shaft is made up of cast steel. It is used to support wheels and provide motion to them with the help of proper transmission system. One sprocket is attached to the shaft which receives motion from engine with the help of chain. Figure 3 shows the view of shaft used in fabrication of weeder.



Fig. 3: Shaft used in fabrication of weeder

Chain is used to provide transmission of power as well as motion from engine shaft to the shaft carrying wheels. Chain is mounted on sprockets attached and properly aligned. Chain ensures smooth transmission without much loss. Chain used is of single strand type.

Figure 4 shows the chain use in fabrication of Power weeder.



Fig. 4: Chain used in weeder

### E. Handel & Wheel

Handle is used to guide the vehicle in desired direction. Also it is used to vary the speed of machine as desired as accelerator is provided on handle. Handle is designed according to human comfort in height and handling of machine.

There is a single wheel attached to the machine. This front wheel is attached below the chassis.

### 4. WORKING

The working of power weeder machine is as explain in following steps given below:

- i. Initially we have to start the engine by starter button which is mounted on handle.
- ii. As we used two stroke petrol engines it provides rotational energy to the shaft connected to it.
- iii. It results in the rotation of chain and wheel connected to the chain get rotated.
- iv. The weeder tool gets pushed in forward direction.
- v. Due to the motion of tool when it touches the soil the process of weeding gets started.
- vi. Hence weeding is done with less effort and less cost.





Fig. 5: Designed model of Power Weeder

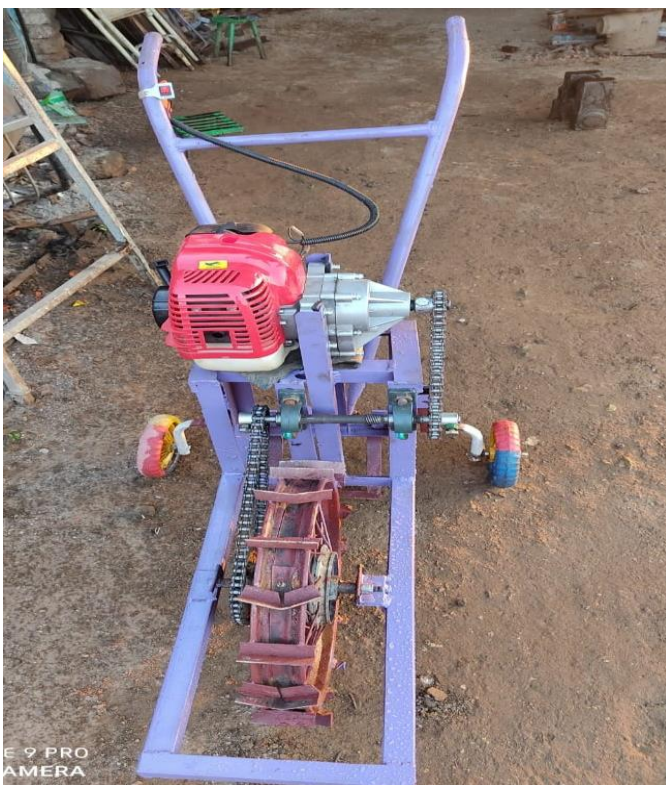


Fig. 6: Front view of Designed Power Weeder

## 5. ADVANTAGES

1. Helps to reduce manpower.
2. Replace traditional method of weeding by using bulls.
3. Remove unwanted grass as well as provide rotary cultivation for crops like soybean, maize and gram etc.
4. Help to reduce process times.
5. Provide low cost and compact design.
6. Reduce use of harmful pesticide for weed control.

## 6. DISADVANTAGES

1. Use of petrol engine requires fuels which is non-renewable.
2. It can be only used for limited crops.

## 7. CONCLUSIONS

It is observed that the depth of tool totally depends on the molecular structure, condition of soil as well as moisture content into the soil. This work is about integrating of mechanical system to the agriculture fields for the agriculture operations. Many operations including ploughing, weed removal, ground softening etc can be performed. Different agriculture tools are often adopted by applying different mechanisms to the machine. Hence it's a multi operational device that can be effectively used in fields.

The fabrication of Low cost Weeder is done with locally available material. The overall performance of the weeder was satisfactory.

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