

# Design And Fabrication of Solar Powered Weeder Machine

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## ABSTRACT

This in all world Agriculture is the main source. But in India, where farming is often of a higher level. so that for farming man power is very important and the technology is advanced to farming the agriculture. In that technology many machines are invented, like tractor. But the machines are running through the diesel engine, so it will affect by the global warming through the pollution. Then the machines are changed into electric vehicles. But in electric machines can occur many problems then the battery system efficiency is less. So we approach the new assistance of using solar energy. We designed our kit in the method to utilize the solar power and to reduce the power usage. Our project "SOLAR POWERED WEEDER MACHINE" will be used to digging canals for the vineyard plantings, Tree basins and vegetable gardens. In addition it will also help to reduce the man power, global pollution provided.

**Keywords :** Solar Energy, Removing Canal, Weed.

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## I. INTRODUCTION

Because of the labor crisis in agriculture, it is necessary or increasingly necessary to automate the numerous field tasks. In light of this, a straightforward machine has been created and manufactured to remove weeds and other undesirable plants from in between the rows of paddy plants. The weed eater pulls weeds from in between the plants as the machine advances. Effective use of this machine is possible in agricultural fields like paddy fields. On order to use this machine for agricultural purposes, the seeds must be sown in the field at a distance that is at least as great as its breadth. The power tiller is a versatile hand tractor that is typically used on small farms for rotary tilling and other tasks. When in use, an operator follows behind

to control it. It is sometimes referred to as a two-wheel tractor, garden tractor, hand tractor, or walking tractor. Agriculture has always served as the foundation of the Indian economy and will do so for a very long time. Small-holder farmers have always worked their 2 to 3 hectare plots with human effort and traditional implements like the wooden plough, yoke, leveller, harrow, mallet, spade, and large hoe. These implements are used to clear land, plant seeds, weed gardens, and harvest crops. Utilizing hand tools to cultivate land is due to the fact that many Indian farmers do not have easy access to the materials that tractors need.

## II. COMPONENTS

- 1) Square Tube
- 2) Solar Panel
- 3) Wheel
- 4) Wiper motor
- 5) Bearing
- 6) Eccentric

## III. SPECIFICATION AND DESIGN CALCULATION

Component	- Solar panel
Type	- Monocrystalline
Company	- Loom
Panel technology	- Mono perc
Max power	- 125W
Space requirement	- 8 sq. feet
Current at max power	- 6.13 Amps
Max power voltage	- 20V
Open circuit voltage	- 22.5 Volts
Short circuit current	- 6.45 Amps
Operating voltage	- 12 volt
Efficiency	- 82 %
Dimension	- 1020*665 mm
No of cells	-36
Total weight	-2kg(approx.)

### CALCULATION

Weight of the weeder machine	=10Kg
Weight of the battery (1no)	=1.3Kg
Weight of the motor	=1Kg
Additional weight assumed to be carried	=1Kg

### CALCULATION OF THE MOTOR

RATING:

Velocity	=0.2
Max speed required	55RPM
Horse power = $W \cdot (V/234)/3$	
W=Weight	
V=Velocity	

Horse power	=0.23N-m
Torque	=0.014
	=5252*HP/Speed
	=5252*0.0025/55
	=0.23N-m

### CALCULATION FOR BATTERY

BACKUP REQUIRED:

Power of the motor (P)	=12V=150W
Battery backup time	=0.5 Hrs
Total output voltage of battery	=12V
Calculation of required storage	(P*t)*V
P=Power, t=time ,V=Voltage	
	=(150*0.5)*12
	=6.25 AH
	(Ampere hours)

## IV. FABRICATION



**Fig. 1** Fabricated Model

It is guaranteed that the idea will satisfy the needs of small-scale farmers who cannot afford to purchase expensive agricultural machinery based on the machine's overall performance. The machine's price

drops significantly if we make it on a large scale, and we anticipate that this will partially meet the needs of Indian agriculture. Compared to the conventional ways, the machine needed less time and labour. So, in this manner, we may address the labour issue that is currently a necessity for Indian agriculture. 62% of the population in India owns land that is smaller than 1 hectare, which makes up 18% of the total area under cultivation. 44% of the total land area is made up of parcels of 1 to 4 hectares. Only 1% of people possess properties bigger than 10 hectares, and 13% of that space is covered. Power tillers are therefore inappropriate given the circumstances in India. Power tillers are widely used by farmers with medium-sized farms. Farmers with little acreage prefer manual weeding methods to mechanical ones. None of the equipment now on the market make advantage of additional cutting-edge innovations like GPS or image analysis. By implementing these technologies, crop damage can be reduced and crop efficiency, yield, and weed removal rate can all be increased.

## V. BENEFITS

- ✓ The mechanism is really basic.
- ✓ No engine is necessary.
- ✓ For operation, one labour is sufficient.
- ✓ Work is much simpler today than it was in the past.
- ✓ Initial and ongoing costs are lower.
- ✓ Weeding requires less time.

## VI. RESULTS AND DISCUSSION

Prior to the construction or manufacture of any equipment, the product must first be designed. Various designs were produced in accordance with the specifications. Out of all the designs, the best one was chosen. Later, we created this with the aid of AutoCAD and 3Ds Max software.

The specifications were used to determine the dimensions of each component. Following the design of each component, a 3D drawing was produced and used in the manufacturing process. References to the drawing were also made while putting the machine together. The Front view, Side view, Top view, Isometric view, and Rendered view are all included below for your convenience.

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