

# Design, Development and Fabrication of Soil Tiller and Weeder

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**Abstract-**The soil tiller and weeder is one of the many farm mechanization in promoting soil tiller and weeders especially considering the fact that the majority of farmers are having small land. It reduces human effort. The implements are mostly self guided. Working of the project is based on engine and chain sprocket mechanism which moves the cutter or tiller. It is a great saver of time and expenses on field operations. Thus it will have very effective uses on the farm field either for tiling as well as for weeding. Development of high capacity energy efficient versatile machines and combination machinery for increased labor productivity, reduced unit cost of operation, improved timeliness of operation and suitable for custom hiring.

## I. INTRODUCTION

The soil tiller and weeder is one of the many farm mechanization. Unlike tractors, soil tiller and weeders are non-conventional so far as the displacement of labours is concerned. In promoting soil tiller and weeders especially considering the fact that the majority of farmers are having small land. So they can hardly afford costlier tractors. therefore, the soil tiller and weeder should become a useful machine in the internal cleaning of crops which having small distance between them like groundnuts, sugarcane, soya bin crops, cultivation of paddy, in particular, and other crops in general for the smaller farmers. Its main objective is to reduce the manpower as in today's scenario labors are very hard to find as well as it reduces the working time. As it could be far better than the conventional using of labors or bull for tilling purpose.

## II. LITERATURE REVIEW

As we were working on the project we got different aspects of literature review and research papers on the work related to our project. Effect of tillage and mulching on yield corn in the sub-mountainous region of Punjab. In this research paper it is said that the effect of conventional tilling is less than the new improved method of tilling and mulching.

Another research paper is based on the various types of methods and machine used as for tilling in present world. in this review we gone through various machines set up in different parts of world for the purpose of tilling.

## III. CONSTRUCTION & WORKING

The main constructional components of the project are below:

1.5 HP 4-stroke petrol starts kerosene running engine, the blade cutter of EN 8 material, Gear assembly, pulley, body frame, wheels. For this soil tiller and weeder we are using the engine with petrol start and kerosene working. By using of hand priming start method, the engine starts and cutter starts to rotate which is situated on driven axle which is drive by engine shaft with the help of pulleys and gears. Because of two wheels, an operator generally has to walk behind the soil tiller and weeder to guide the direction of travel for various operations.

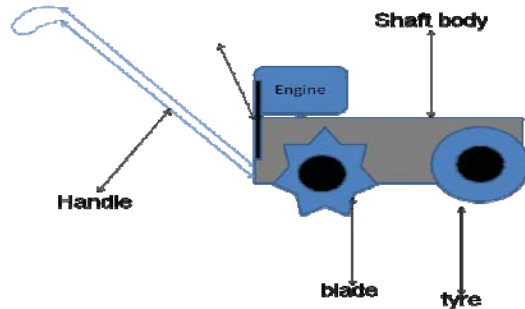


fig. 1. Block diagram of proposed model



**Cutter**



**Body frame**

fig. 2. Body Frame & cutter

#### IV. NEED OF THIS PROJECT

Soil tiller and weeder reduce human effort as compared to operation by bullocks. The bullock implements require the hand and body pressure to achieve depth and alignment of the implement in use, whereas in soil tiller and weeder, the implements are mostly self guided. This reduces human drudgery to a great extent. The comparative higher output of operation by the soil tiller and weeders as compared to bullocks reduces the operational time and achieves timeliness in operation. The maintenance of the soil tiller and weeder is easy. It is ideally suited for mechanizing small farm holdings which account for 80 % of the farm holdings of the country. Cost wise the soil tiller and weeder should be an obvious choice of smaller farmers, if they are intending to have a mechanical power source for farm- operation. Soil tiller and weeder reduce the drudgery of collecting the waste grass between crops in the field during operations as compared to operations by bullocks. The soil tiller and weeder makes the manual of that wastage grass by cutting it in small piece and thoroughly mixed with soil during operation.



## V. SPECIAL FEATURES

From the word "soil tiller and weeder", one can make out that there is a tiller which is powered. In this case the tiller is powered by an internal combustion engine and so is the name derived. The soil tiller and weeder appear to be replacing the animal power more effectively and help in increasing demand for human labor. The small and marginal farmers form major clientele for custom hiring of soil tiller and weeder. In highly fragmented and small holdings, soil tiller and weeder is preferred for arduous farm operations like paddling and preparatory tillage. Soil tiller and weeder is preferred by small farmers and is being used primarily for earning cash income through custom hiring. Thus, this machine provides opportunities for self-employment in rural areas. Even marginal farmers and landless laborers effectively and profitably use the soil tiller and weeder for self-employment.

## VI. TYPES OF OPERATION

Depending upon the mode of operation, three types of soil tiller and weeders are there –

***Pull type*** - the soil tiller and weeder in which pull to the tiller is required to perform the work like internal cleaning of crops, cultivation in paddy when helical cutter is used.

***push type*** - the soil tiller and weeder in which push to the tiller is required to perform the work like grass cutting when ripper is used as a cutter uses an engine power driven tilling device, such as rotary and crank or screw blades.

***General purpose type*** - the soil tiller and weeder which can be used for a number of farm operations, including the types defined under pull type and push types.

## VII. ADVANTAGES & APPLICATION

- In other words, it is a great saver of time and expenses on field operations.
- Because of smaller size, two wheels and limited constructional arrangements, the soil tiller and weeder becomes one of the lightest yet most effective farm power sources.
- Its operations are controlled by an operator through its extended handles by walking behind it.
- One of the special features of a soil tiller and weeder is that it's both the wheels can do two jobs at the same time.
- It makes the soil tiller and weeder move forward through traction of its wheel with the ground and at the same time change the direction as operator desires.

internal cleaning of crops having minimum distance between them like wheat crops, soya bin crops, groundnuts, etc. in paddy cultivation, cutting of grass of height 3-4 feet's weeding of crops. Remove useless plants growing in cultivated field. Therefore, it can be appreciated that there exists a continuing need for new and improved equipment with incorporated mechanical system which can be used as agricultural equipment that normally accumulates to be instantly consumed. In this regard, the present invention substantially fulfills this need.

## VIII. RESULT &amp; CONCLUSION

The result from this above project outcomes are assurance of much efficiency, less time consuming, worker friendly machine respective to the conventional method of tilling. It assures you of maximum work done with minimum work effort.

Conclusion of the project work is that it helps the students to their extended imagination, engineering skills and fundamental knowledge. This semi automatic machine is developed to reduce the time and effort required for production up to the great extent .also this machine manufacturing cost is less as compared to other.

by selecting above topic we are understand , familiar and know the details of agricultural technology, with the help of this semi automatic machine we are trying to reduce labor cost, time of a middle class and small sector farmers.

this is our little effort to make comfort to our farmers also this machine is manufactured in less cost as compared to other. the project also teaches the way of working as a unity proper co ordination is to be established with student in the project group. it enhance the thinking or filling of mutual co operation in the project

Also the projectees learn to fabricate any model according to its requirements. All the manufacturing processes are carried out with a great concentration; any wrong calculation may have result in the failure of project model.

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