

DESIGN AND MANUFACTURING OF MOBILE SHREDDER MACHINE

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Abstract: This paper addresses the development of shredder machine operated by tractor. India is mainly known as agricultural country. Presently Indian Farmer Used conventional method for crop cutting. Labours are majorly used for cutting purpose in conventional method. There are two methods of crop cutting i.e Conventional and Mechanical. But for farmers having large scale land, the conventional method is quite lengthy and time consuming. The Crop Shredding Plays an important role in Agricultural. The Paper presents the idea of design and analysis of Shredding Multicrops in farm.

Index Terms - Crop cutting, Shredder Machine, Bevel gear, Cutting Mechanism, Manual method.

I. INTRODUCTION

In this paper we develop the instrument called multi crop Shredding cutting Machine is to help farmer those having small scale land to fulfill their demand, it cut the crop by more ease. Our main target is ease of cutting operation to the small land holders for cutting varieties of crop in less time and at low cost by considering different factors as power requirement, cost of equipment, ease of operation, field condition, time of operation and in various weather conditions. This is very cheap in cost but used mainly for shredding purpose. So therefore we design and fabricate the multi crop cutter. For multi crop cutter no need for electricity, because it is manually operated it is operated on the basis of gear mechanism. Crop Shredding machine is a mechanical device which is used for cutting various crops. Thus by adjusting its cutting blade, speed, tension it can easily change cutting force from one crop to another. This can be applicable for cutting of the crop such as Jawar, tuar, & bajar, etc.

II. LITERATURE REVIEW

To Reduce Labours required for Shredding of crops in agriculture. Dr. U.V. Kongre.

The Multi crop cutter is designed, fabricated and tested. This machine does not employ any use of power equipments such as DC motors and it is fully human operated. The use of this machine makes the harvesting process faster hence reduce most of the cutting time and labour required to operate the machine is also less. This machine is helpful for small as well as big farms. This human powered machine will help to improve an economical condition. This is new type of machine which is different to the other cutting machine which are used for harvesting purpose till now. [1]

To Complete the same work to be done by less no of workers by mechanical method, instead of more no of workers by conventional method. Roshan Ghodkhande.

It can be concluded that the machine is comparatively compact and easy to handle. This machine is able to run of field effortlessly and the efforts of farmers are reduced. The cost of harvesting using this machine is considerably less as compare to manual harvesting. The harvesters available in market are suitable for large farms, so this can be the best machine for the farmers with small land. The success of this machine depends on how the farmers receive this machine as their manually. [2]

III. PROBLEM STATEMENT

Recently observed that there is shortage of skilled labor available for agriculture. But the small holding farm owners generally do not require the full-featured combine harvesters. Also, these combine cutters (Shredders) are not available in all parts of rural due to financial or transportation reasons. Thus, there is a need for a smaller and effective combine shredder which would be more accessible and also considerably cheaper. The mission is to create a portable, user-friendly and low cost small shredder machine. These Conditions gave the basic idea about what was required in the current scenario. The idea was to create a machine which is cheap and will reduce the labour required to harvest crops. This machine has the ability and the economic value for fulfilling the needs of farmers having small land holdings (less than 2 acres). This machine is cost effective and easy to maintain and repair for the farmers.

Drawbacks of the Present Manual Crop Cutter:

1. The speed of the blade used for cutting is slow and thus resulting into unwanted jamming in the machine.
2. The motion of reel is derived from front wheel; this is restricting the crop passing towards cutter.
3. The present design of the machine is specifically designed for AC motor. The speed and forces required to drive the machine are estimated as per ac motor.
4. The present design can cut the crops and can store it but there is no mechanism to separately collect the unwanted crops.

IV.METHODOLOGY:

With the demand for the grains on rise, the aim was to fabricate inexpensive reaper collector for increasing the economy of small scale farmers.

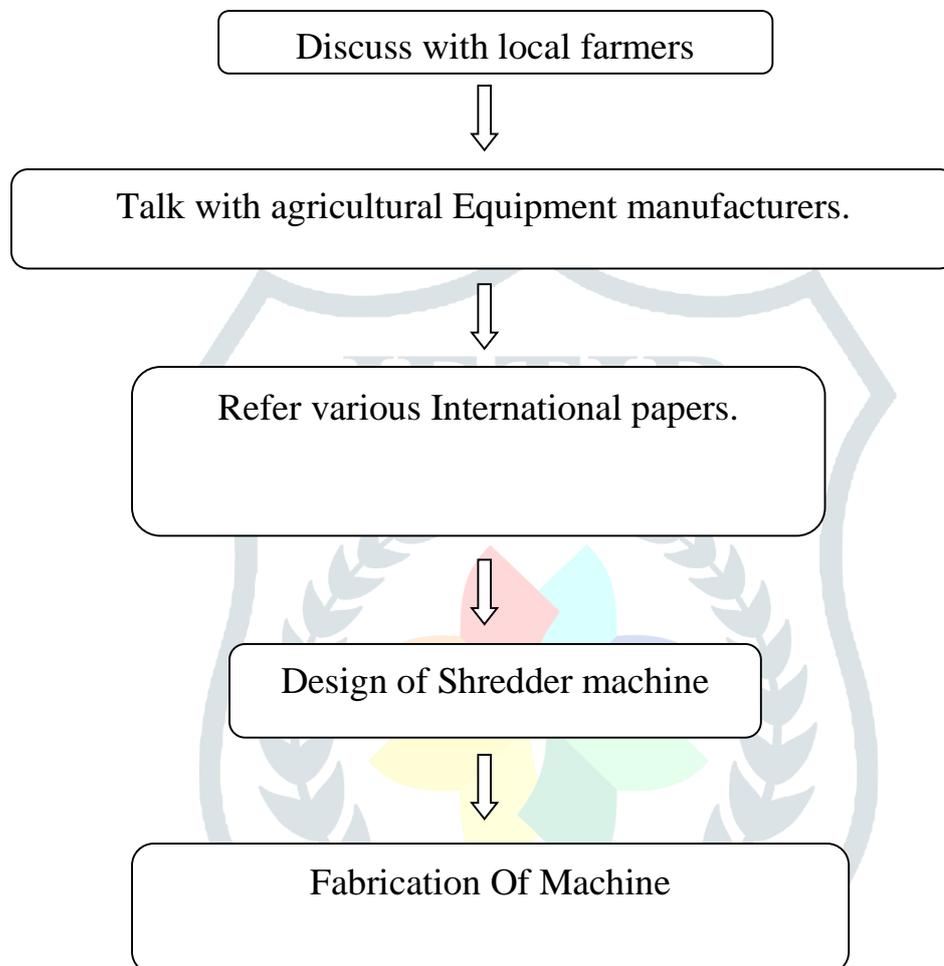


Fig. no.4.1 methodology

A. Conducting Interviews with Farmers: The design of this device was to be based on the demand for a compact and affordable harvester. This demand could have been seen only with personal interaction with small scale farmers. Most of the farms are small scale farms.

The following queries were asked to the farmers:

- [1] What are the machines available for cutting crops?
- [2] What do these machines cost?
- [3] What are the traditional techniques used for cutting?
- [4] Can a small harvester collector be able to satisfy the increasing prices of labour?
- [5] What is the labour cost for shredding, as it is the most labour intensive work? These questions gave the basic thinking about the situation of small scale farmers. We came to know the needs and the requirements of the farmers.

B. Consulting Agricultural Machines Manufacturer: We Visited the Agro shop about the manufacturability for the harvester. Jay kisan Agro industries have been providing agricultural equipments. We interacted with them about to get the basic thinking about the manufacturing Instruments that are available. The following questions were asked to get a generalised idea about the various types of manufacturing equipment.

- [1] What are the Instruments manufactured for the farmers today?
- [2] How many No. of these manufactured equipments are available for small scale farmers?
- [3] Why are there no small scale shredder machine manufactured for farmers?
- [4] Why does the company ask local farmers while designing a new product?
- [5] What difficulties are faced while designing a machine based on the needs of the farmers? All these questions were noted and notes were collected for further study.

V. CAD Model

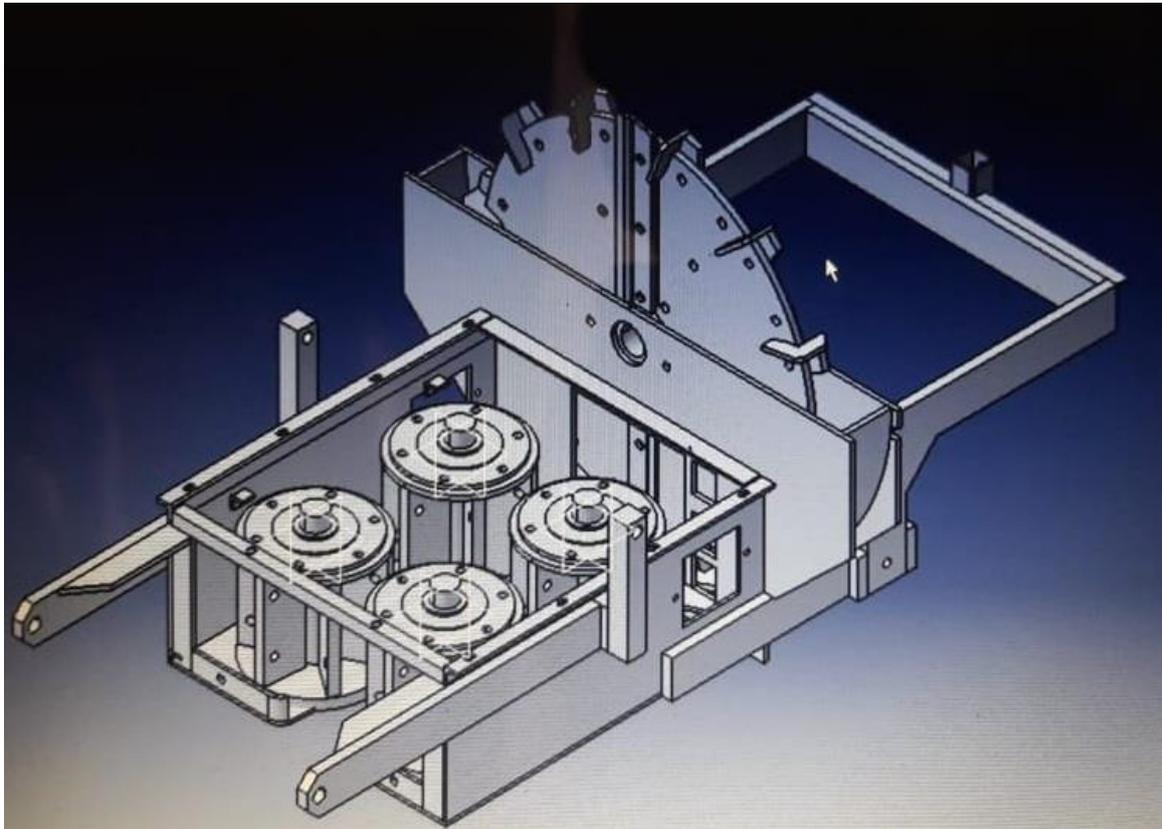


fig. no.5.1 cad model of shredder machine

VI. ADVANTAGES OF SHREDDER MACHINE:

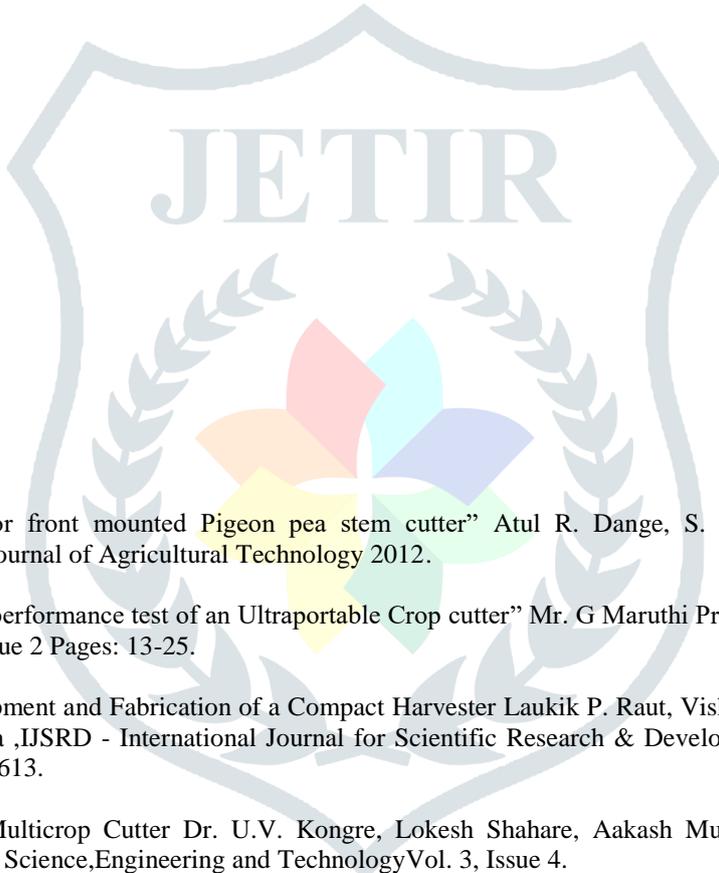
- Fastest, easiest and efficient way of removal of sticks
- Improve soil fertility
- Retain soil moisture for longer period
- Keep soil spongy & loose
- Increase aeration
- Enhance microbial activity
- Increase production
- Environment friendly
- Safe for operations
- High productivity –One acre/hour
- Machine can be used for hiring purposes and adds to farm income
- Reduce the human effort
- Reduce the cost
- Reduce the time
- Easy to handle
- Unskilled worker can operate
- Safety to use

VII. Conclusion:

From this work the result were drawn for the work to be done in 1 acre area without a multi crop cutter or manually, whereas by using a multi crop cutter we can complete the same work in the same area (1acre) by using only one labor. Therefore, time can also be saved by using the multi crop cutter. It is concluded that the device is most economical.

It can be concluded that the Shredder machine is comparatively compact and easy to handle. This machine is able to run of field effortlessly and the efforts of farmers are reduced by this machine. The cost of Shredder machine using this conventional method is less as compare to manual shredding. The Shredders available in market are suitable for large farms, so this can be the best machine for the farmers with small land.

VIII. References :

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