

## Multi Crop Cutter: A Review

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**Abstract-** Today, agriculture especially in India need to concentrate in some situation such as how to increase the productivity and profit, how to reduce the cost and labor efforts. To overcome these, a new manually operated cutter is fabricated specially for cutting various crop varieties and named as an “MULTI CROP CUTTER”. It is easy to fabricate, low cost and light weight. With this Multi Crop Cutter, the entire problem can be solved easily. There are some steps involved in fabricating this machine such as fabricating the small model using suitable material and test the functioning of this machine. So the aim is to fabricate and test the performance of the small model of a manually operated crop cutter for cutting the crop. Time require for cutting crop is main importance. During cutting of crop season, often rains and storm cause considerable damage of standing crops. Rapid cutting of crop gives more time for preparation of land for next crop planting. The use of machines can help for cutting at proper stage of crop maturity and reduce operation time. Considering these improved cutting tools equipment, combine being accepted by the farmer.

*Index Terms-* Productivity, Crop Cutter, Fabricate, Harvesting.

### 1. INTRODUCTION

The history of agriculture in India dates back to the *Rugveda*, written about 1100 BC. In world the use of agriculture equipment is increasing. India uses only 10% agricultural equipment's as Conducted survey in year2012. Nowadays India has second rank worldwide in farm output. Agriculture like forestry and fisheries accounted for 13.7% of the GDP (Gross Domestic Product) in 2013, about 50% of the total manpower. The economic contribution of agriculture in India's GDP is continuously decreasing with the country's broad-based economic growth. Still. As per the 2010 FAO world agriculture record, of wheat and rice, this is the world major food. India has ranked between five largest producers over 80% of agricultural produce items. All countries used wide range of technology for production of crops including soil cultivation, and cutting of crops, and the activities of proper processing and marketing. Many different factors influence the kind of agriculture practiced in a particular area. It differs from climate, soil fertility, availability for near market place. The first agricultural products consist of crop plants for human food and animal feed and waste products from crops. Crop cutting machine is an essential tool. They are different in size, way of operation, and power. The power source for such machine is usually gasoline engine and can ride by skilled operator. Modern gas powered and electric powered lawn grass cutters cut grass with a single blade revolving at a high speed parallel to the ground. This blade is slightly raised from its rear edge to create draft that lifts the cutting blades before its cutting operation. Reduce the cost on the harvesting method. In this paper we develop the instrument called multi crop cutter is to help small-scale farmers to fulfill demand and supply for market,

it cut the crop more easily. Our aim is on focus easy 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 climatologically conditions. This is very cheap in cost but used the electricity is not profit getting factor. 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.

### 2. IMPORTANCE OF PROJECT:

This project is to help small-scale farmers to fulfill demand and supply for market, by designing a multi crop cutter machine it cut the crop more easily. Our aim is on focus easy 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 climatologically conditions. The operating, adjusting and maintaining principle are made simple for easy and properly handling by unskilled operators.

### 3. PROBLEM STATEMENT

In India especially southern part of the country where agriculture becomes the new focus which can give many advantages and benefits especially to our economy, politics and social. Paddy and Wheat is one of the new targets in agriculture where still not much researchers and manufactures

participate in this field. From that there are some problems arise such as how to maximizing the profit, how to increase productivity and how to reduce the cost. One of the important activities in Paddy and Wheat is harvesting. This harvesting operation requires 50% of the investment on the particular crop goes to harvesting the crop and its transportation due to increase in wages of the labor and reduce in availability of labor leading to the high demand of the labor. So the ideas to reduce the dependent on workers in this harvesting, this project comes to solve all this problems where the new invention for machinery in harvesting which able to reduce the workers. By using the tools like machinery, the dependent on the worker can be reduce, productivity can be increase, the cost can be reduce and the profit can be increase. From that, the main objective for this project is to design and fabricate the prototype of a motorized cutter to harvest crop for commercial used can achieve.

#### **4. SIGNIFICANCE OF STUDY**

This study is to design and fabricate machinery which can reduce dependent to workers which give much effect to our country in maximizing the profits to the farmers. To design and fabricate this machine, there are several criterion are selected such as easy to fabricate low cost in long term and can harvest high and with easy to use.

##### **4.1. Objectives**

- i. Make the review about other research and study relevance to the title.

- ii. Design the prototype of manually cutter for a harvesting crop using some criteria such as low cost. Material Selection.
- iii. Select suitable material, components.

#### **5. OVERVIEW OF MACHINE AND SPECIFICATIONS**

**5.1. Materials** This chapter deals with material and methods with following heads. Material is selected on the basis of strength requirement of various components of the mechanism

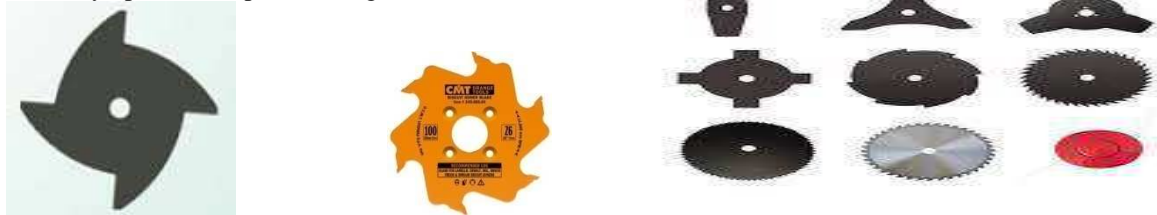
##### **5.2. Lists of machine component.**

- (1) Frame
- (2) Ground wheel
- (3) Flywheel
- (4) Shafts
  - Horizontal shaft
  - Vertical shaft
- (5) Cutter
- (6) Cycle wheel
- (7) Chain
- (8) Shaft

##### **5.3. Model of machine**



(Fig1) Isometric View of manually operated crop cutter (Right side)

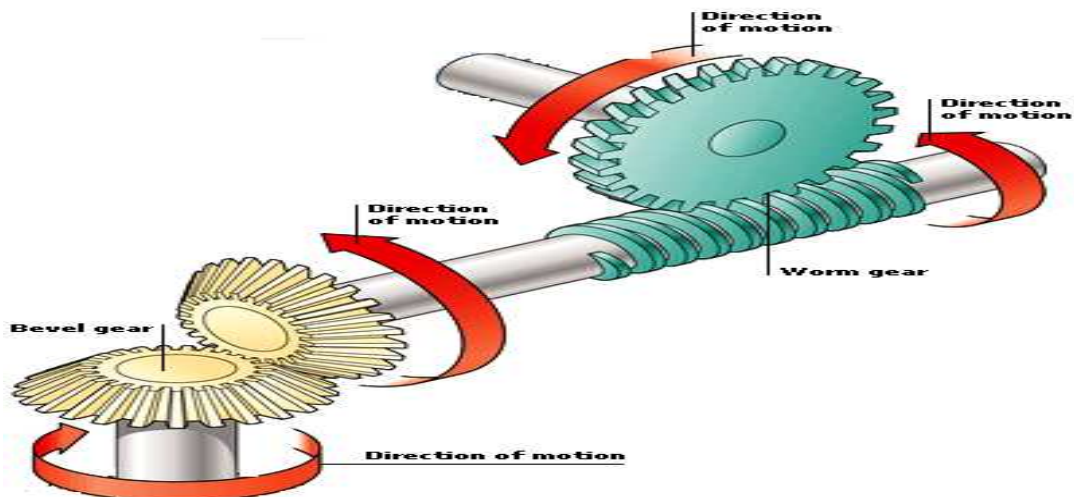


(Fig2) Different types of cutters



#### 5.4. Parts of a machine

- **Flap:** Is mounted on vertical shaft is used to transfer cut crop in storage unit
- **Cutter:** It is also mounted on vertical shaft and is cut various crops in agriculture.
- **Wheel:** When wheel is rotating it transfer rotating motion to the shaft.
- **Freewheel:** When push the machine forward freewheel engage with shaft and push the machine backward freewheel disengage with shaft..
- **Chain drive:** Horizontal gear is mounted on shaft it transforms power form vertical gear with the help of shaft is axis is intersecting to other.



(Fig4) chain drive assembly

6. TABLES

[3] Mohd Ishammudin Bin Mohd Yunus, "Design and Development of Grass Cutting Machine Using DEMA Methodology", Universiti Teknikal Malaysia Melaka, 2007/2008

Sr. no	Component	Material used			
1	Frame	Mild steel			
2	Ground wheel	Outer woes rubber			
3	Flywheel	Mild steel	[4] Zulquernain Mallick, "Evaluation and Optimization of Handle Design Parameters of a Grass Trim Machine", International Journal of Occupational Safety and Ergonomics (JOSE) 2008, Vol. 14, No. 3, 343-349		
4	Shafts 1 horizontal shaft 2 vertical shaft	High carbon steel			
5	Cutter	High carbon steel			
6	Chain	High carbon steel			
7	Shaft	Cast iron and aluminum			

Table 1 Components and material used.

7. SUMMARIES AND CONCLUSION

7.1. Summary:

The present work was carried out with objective to design, modification and evaluate the performance of Manual operated reaper. Observations are carried out to calculate its performance like depth of cut, efficiency, labor requirement, overall cost etc.

7.2. Conclusion:

From this work the following conclusions were drawn for the work to be in lacer 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 (1acer) with only one labor. The same throughout the day, as man get strained, whereas a machine cannot. Therefore, time can also be saved by using the multi crop cutter. It is concluded that the device is most economical.

Acknowledgments

I prepared the above paper with the help of some research paper and also I thankful of my friends, teachers for their guidance.

(A.1)

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