

Agricultural Sugarcane Harvesting and Tying Machine

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ABSTRACT:

This project work Aims to develop agricultural harvesting machine Which is more efficient and having simple mechanism for harvesting the Sugarcane And tie the sugarcane bundles at a faster rate and should low cost that is affordable by the rural farmers, easy to maintain and less laborious to use. By using petrol engine it can run and harvest the sugarcane with chain and crank mechanism.

It is very useful in these days because labour scarcity is more in these days that's why we introduce these harvesting and tie machine to reduce the labours, by using this machine we can reduce the number of labours are involved in the sugar cane harvesting, it can useful for all farmers to harvesting of sugarcane and tying of sugarcane into bundles.

I. INTRODUCTION

In India agriculture is facing serious challenges like scarcity of agricultural labour, not only in peak working seasons but also in normal time. This is mainly for increased non farm job opportunities having higher wage, migration of labour force to cities and low status of agricultural labours in the society. Sugarcane is the world's largest crop 2010 Food Agricultural Organization (FAO) estimates it was cultivated on about 23.8 million hectares in more than 90 countries, with a worldwide harvest of 1.69 billion tons. India is the largest producer of sugarcane in the world and Brazil in second position. Indian farmers are now a days

changing from old farm to modern techniques and tools .The modern tools and machinery used for harvesting makes manual work simple.

By using this modern tools and machinery makes harvesting economically and less cost.

The sugar cane industry shares about 48% of total crop production in India.

So we came up with an idea to built a portable sugar cane harvesting and tying machine which is not only cheap but also reduces human effort and Time.

Harvesting is a process of cutting and gathering of mature crop from the field. Harvester is a machine is used for harvesting. Different types of harvesting machines are available in the market namely paddy harvester, Tea harvester, Potato harvester, Wheat harvester and sugarcane harvester as mentioned above all are available in small scale except sugarcane harvesting machine. Sugarcane harvesting is an agricultural machinery use to harvest and process sugarcane. Sugar cane is a hardy crop that is cultivated in tropical and sub-tropical regions for its sucrose content and by-product such as molasses and bagasse (the waste fibrous residue). The plant grows in clumps of cylindrical stalks measuring from 1.25 to 7.25 cm in diameter and reaching 6 to 7 m in height. The stalks grow straight upward until the stalk becomes too heavy to hold itself up. It then lies on its side and continues to grow upward. This results in a mature cane field lying on top of itself in a mesh pattern.

Mechanical Harvesting and Tying Machine:

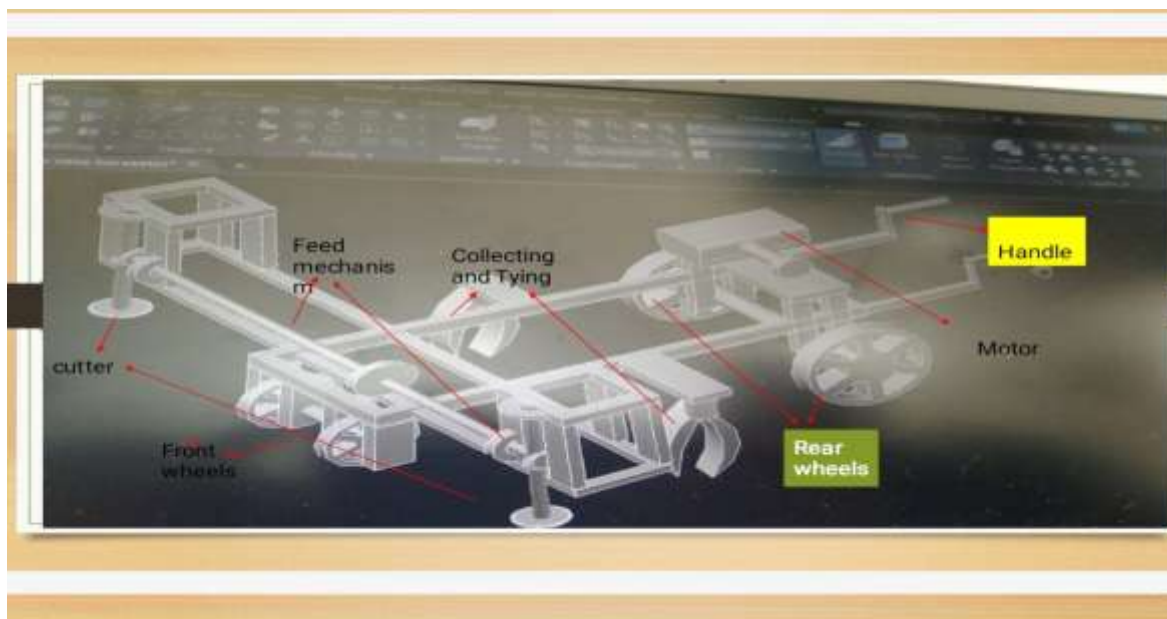


Fig3: Cad Model of Mechanical Harvester And Tying machine

Sugarcane is harvested by hand and mechanically. Hand harvesting accounts for more than half of production, and is dominant in the developing world. In hand harvesting, the field is first set on fire. The fire burns dry leaves, and kills any lurking venomous snakes, without harming the stalks and roots. Harvesters then cut the cane just above ground-level using cane knives or machetes. A skilled harvester can cut 500 kilograms (1,100 lb) of sugarcane per hour. Now days in many countries mechanical sugarcane harvester is used for sugarcane harvesting. It is fully automated. It requires very less time for cutting sugarcane around large area. Many foreign companies are involved in sugarcane manufacturing like john deer, New Holland.

1. Harvesting is done by using large mechanical harvester, which cuts the harvest sugarcanes in a minimum time and tied by using tying machine which is attached with the sugarcane harvester.

2.They are applicable only in large areas.

Mechanically Sugarcane harvesting:

Factors which cause sugar cane harvesting done mechanically are as follows:

- (1) Difficulty in obtaining sugar cane cutters.
- (2) Cane cutting labor can only work for 8 hours during the day while the sugar cane harvesting machine can work for 24 hours
- (3) Capacity of sugarcane harvesting machines is much greater than manual cane cutting
- (4) The maximum time for sugarcane harvest is relatively short so that the use of sugar cane harvesting machines (Sugarcane harvester),

especially in areas with limited manpower, will be able resolve the harvest activities at a given time, so that losses can be reduced.

Factors generated in the fields where sugar cane harvesting machines operated which affect the efficiency of time and cost of harvesting are the following:

- (1) Slopes
- (2) Shape of the field
- (3) Ridge height and width
- (4) Cleanliness of land from foreign objects.

II. RESULT OF THE VISIT

A. Application for the semi mechanical harvesting and tying machine and tools. For the cane harvest and tie application it is only the cutter and to lay the cane it requires 6w 8 people. The result of the Cane harvester and tying application is as follows:

- Capacity: 0.14 HaJhour =10 MT / hour =70 MT / day
- Quality: Solid, flat and the cutting result is that not broken into pieces
- Quantity of manpower: 1 operator & 8 assistance I day (per 70 MT)
- Fuel requirement: 0,5 Litre J hour For topping and cleaning a thrasher was used .

The test result for the tying machine is the following:

- B. Capacity : 1,2 MT / hour
- C. Quality of the work: Tie the sugarcanes (thrash 0 %)
- D. Quantity of manpower : 1 people

Materials required:

Mild steel: Carbon steel is sometimes referred to as 'mild steel' or 'plain carbon steel'. The American Iron and Steel Institute defines a carbon steel as having no more than 2% carbon and no other appreciable alloying element. Carbon steel makes up the largest part of steel production and is used in a wide range of applications. Typically carbon steels are stiff and strong. They also exhibit ferromagnetism (i.e. they are magnetic).



This means they are extensively used in motors and electrical appliances. Welding carbon steels with carbon content greater than 0.3% requires that special precautions be taken. However, welding carbon steel presents far fewer problems than welding stainless steels. The corrosion resistance of carbon steels is poor (i.e. they rust) and so they should not be used in a corrosive environment unless some form of protective coating is used.

Chain saw cutter
Wheels
Battery.

Advantages:

1. Increased yield because of effective harvesting as it roots down to the bottom level of the crop.
2. It can reduce the labour cost.
3. Required less number of labours.
4. Less time consumption.
5. Makes the harvesting economically

Disadvantages:

- ❖ It requires skilled operator.
- ❖ Regular oiling of machine components
- ❖ Regular sharpening of blades is required

III. CONCLUSION:

By using this machine, the problem of the labour crisis can be reduced. Comparing with manual harvesting, only 3 labours are required. It makes the process faster, hence reduces most of the harvesting time and labour required to operate the machine, which is also less. The small-scale sugarcane harvesting machine is fabricated. After testing the small-scale sugarcane harvester in the field, it is found that

the front wheels are stuck in mud, due to that the machine was not moving, so 360-degree rotating wheel is fixed at the front for the proper and smooth movement of the machine. By using this machine, the problem of the labour crisis can be reduced. Comparing with manual harvesting, only 18% of labours are required. It makes the process faster, hence reduces most of the harvesting time and labour required to operate the machine, which is also less. So, it reduces the labour cost. The machine is used by a maximum number of farmers, definitely, farmers can overcome the labour crisis problem. This reduces the labour cost and process becomes faster and easy. The productivity is also increased.

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