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A Review on Design and Fabrication of Sugarcane Bud Cutter Machine

[1]Praveen K C, [2]Babugouda S, [3]Girish B B, [4]Manu K N, [5]Rahul Kumbar

[1]Associate Professor, Department of Mechanical Engineering Alva's Institute of Engineering and Technology, Mijar Moodbidre Karnataka
[2,3,4,5]U.G. Student, Department of Mechanical Engineering Alva's Institute of Engineering and Technology Mijar Moodbidre Karnataka

ABSTRACT:

Industrial plants, oil seeds, etc. One of the significant commercial crops grown in India is sugarcane.

In India, agriculture has significant difficulties such as a lack of agricultural workers both during the peak working seasons and throughout the year. This is mostly due to the rise of high-paying nonfarm jobs, labour force movement to cities, and the low status of agricultural labourers.

We all know that our nation is known as "AGRARIANS," so we must concentrate on agriculture, particularly in India, and on issues like how to boost productivity and profit, how to cut costs, and how to address issues that arise from workers because we can see that many farmers are working hard because of this.

KEYWORDS: Chipper, buds, cumbersome.

INTRODUCTION

SUGARCANE BUD CUTTER

The present method of distributing sugarcane sets caused a farmer much difficulty in cultivation, and planting individual seedlings proved to be an inefficient alternative. The lack of vast quantities of saplings hampered it. The farmer wondered if sugarcane buds could be dispersed around the fields like potatoes instead of being planted, and we discussed this idea with a knowledgeable person.We started working on the idea after hearing positive feedback to give it a shot.The end product is a simple floor-mounted device known as a sugarcane bud chipper, which has a semicircular-edged knife for surgically removing the buds in a high-impact operation that leaves a clean finish and virtually no waste. The machine is versatile; it can cut sugarcane into little pieces and handle a range of cane widths and sizes. Conventional hand-held cutting tools damage plants with slanting cuts, strain the hands and thumb, and are unable to manage challenging plant grafting. machine details The components that make up the bud-chipper include a surface plate, holding stand, reciprocating assembly, connector, actuation lever with adjustable screws, U-shaped cutting knife, supporting studs, and propeller.The device enables the user to cut sugarcane while sitting comfortably on the ground and feeding the cane continually with the left hand while the motor runs.

Accurately carve the semicircular shape.This equipment is capable of much more than only removing sugarcane buds, and its little weight (a few kilogrammes) makes transportation easy. It is also more widely applicable as grafting equipment, enabling the removal of large plant buds.

. After experimenting with various cutting shapes, we eventually came up with a U-shaped cutting profile to quickly clip the bud without damaging the rest of the plant. bamboo stem. A table's version While experimenting with the idea of a tabletop version instead of the present floor-based one, we realised that the design would be more compact to feed the cane at the precise height, for better performances.

NEED FOR BUD CUTTER

The only people who need a sugar cane bud chipper are farmers who use full-size sugarcanes in their fields for plantation purposes. By using a sugar cane bud chipper to cut them into smaller pieces that are compact in size, we can also use those pieces for plantation and prevent the waste of the remaining sugar cane..

Figure. 1. bud cutting method

METHODOLOGY AND OBJECTIVE

METHODOLOGY

1)Making the switch from manual to automatic methods will enhance production by reducing the strain on workers' hands and placing a greater emphasis on operator safety while reducing waste.

2) New cutting-edge technology - To accomplish the intended result, new approaches were devised after study in this field was examined.

3)Single phase operation - To make the equipment simple to use anywhere, the electricity provided to it is single phase. 4) Safety of the operator is given the utmost importance.

OBJECTIVE

To change the design of the bud chipping machine so that the farmer can cut the sugarcane bud into a shape that can be used as a planting for sugarcane agriculture. easily, which lowers the amount of human labour required by farmers and boosts output.

CLASSIFICATION OF METHODS

MOTORIZED METHOD

An electrical machine that transforms electrical energy into mechanical energy is an electric motor. small loads, such as those used in domestic applications. Induction motors are increasingly used in variable-speed service using variable-frequency drives, while being traditionally used in fixed-speed service. When compared to manual method, the method where the motor is mounted on the table and the out valve is with the gear assembly is the simplest.

HAND PRESS METHOD

This method, which uses a manual hand press, requires applying great pressure to cut the bud from the sugarcane, which is a laborious and time-consuming process. It consists of a handle that is spring-connected to the blade for the purpose of providing a thrust.

PEDAL PRESS METHOD

This sort of machine works similarly to the manual press method; however, we have included a foot pedal in place of the handle. It consists of a long rod or chain connected to a spring shaft that is hooked to a blade, and when the foot pedal is depressed, the spring acts to cut the sugarcane bud.

HYDRAULIC METHOD

We can also use hydraulic motors in place of motors, but they are more expensive than other types of machinery, are difficult for farmers to operate, and have lower efficiency overall.

COMPONENTS

FLY WHEEL

Flywheels are used to slow down shaft motion and regulate rotational speed. The majority of contemporary gearboxes are utilised to lower the speed of a prime mover output shaft while increasing torque. This means that a flywheel's output shaft rotates more slowly than its input shaft, which creates a mechanical advantage and increases torque. The physical rotating direction of power transfer is all that some of the simplest gearboxes do.A flywheel with a worm and worm-wheel arrangement is much smaller than one with a basic spur gear and has drive axes that are 90 degrees from one another. With a single start worm, the worm-gear advances the gear only one tooth for every 360° rotation of the worm.

RECIPROCATING CHAMBER

The blade attachment was supplied with a reciprocating chamber, and the shaft or chamber was connected to the flywheel by a connecting rod so that it could move up and down to cut the sugar cane.

U- SHAPED BLADE

The major portion of the equipment for cutting sugarcane buds is this. The sugarcane bud is sliced with a chipper to produce buds of the same size. Because of the cutter, less sugarcane is wasted and farmer safety is improved. It had a stainless-steel construction and was curved for a compact cut.

CONNECTION RODS

When the flywheel rotates, it acts as a slider crank mechanism for the movement of upside down. The connection rods are used to connect the flywheel and the reciprocating arrangement. One end of the connecting rod or shaft was connected to the flywheel, and the other end was connected to the reciprocating chamber.

SUPPORTING FRAME

The entire arrangement was built upon the supporting frame, which was constructed from the rods by joining them together to form a table or frame. It is extremely simple to perform a machining operation on that frame.

SUPPORTING PLATE

It is the thick steel plate that was put on the supporting frame as a flat surface area on which we positioned the motor and blade settings.

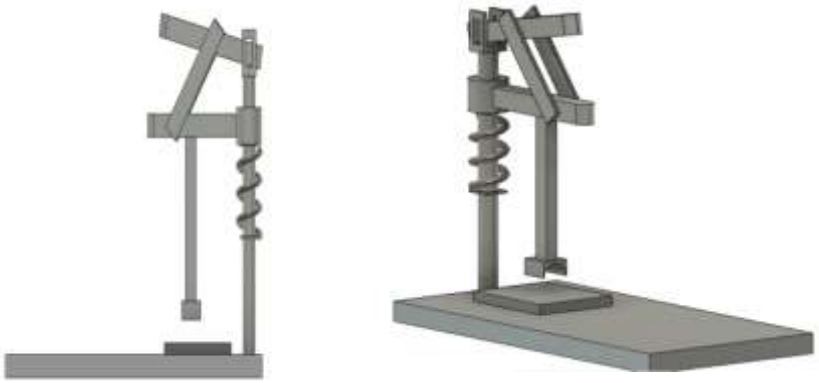

Figure 2, 3D cutting model

WORKING

• An engineer was challenged to create a machine that can remove sugarcane buds for plantation purposes in order to reduce losses as well as time, money, and seeds with this tool.

• The unit removes the bud from the sugarcane node by depressing the food pedal; the node is then ready for planting. It was hindered by the scarcity of saplings in large quantities. The farmer pondered whether sugarcane buds could be spread like potatoes on the fields rather than being planted. The tool is used to remove the bud from sugarcane for tissue culture and seeding. It is made up of a platform, hemisphere chipping knife, and sphere chipping knife.

• The unit's novelty is in the foot lever-operated hemisphere chipping knife, which offers delicate bud cutting without causing further sugarcane loss during planting. By using the remaining canes that have been chipped, which can be utilised for creating sugar as well as other things, the farmer ultimately earns more money. Instead of utilising a manual machine or a pedal-operated machine, this can alternatively be accomplished by employing an electrical or hydraulic device. However, these devices are expensive.

• We are using an electric motor in this chipper since it is simpler and quicker to chop the sugarcane buds with one than with a manual kind of cutter.

ADVANTAGES

• Simple in construction.

• Initial cost is low.

• Easy to maintain.

• Less man power.

• Save large amount of sugarcane bud from waste by plant in farm.

• Sugarcane bud cutting operation is very fast as compare to traditional system of sugarcane planting.

• Saved sugarcanes are used for fodder, pasturage for animals or for the sugarcane industry.

APPLICATIONS

• These chippers are used by the formers.

• These are also used in sugar factories for the separation of buds.

CONCLUSIONS

For small-scale farmers who want to plant sugarcane buds, the sugarcane bud cutting machine is quite helpful. Additionally, this method saves time when compared to the conventional sugarcane bud plant system. By using a sugarcane bud cutting machine, extra sugarcane bud waste from small-scale farms can be collected and used as animal fodder.

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