



## Design And Fabrication Of Electrically Operated Sugar Cane Bud Cutting Machine

**P.S.Pathak<sup>1</sup>, V.R.Rathod<sup>2</sup>, S.khadse<sup>3</sup>, S.Waghmare<sup>4</sup>, R.Sharma<sup>5</sup>, R.Lokhande<sup>6</sup>, S.Wankhede<sup>7</sup>**

*Prof. Dilip R. Rangari, Dept of Mechanical Engg., SSPACE Wardha, Maharashtra, India, [drsspace@gmail.com](mailto:drsspace@gmail.com)*

<sup>1</sup>*Student, Mechanical Engineering, SSPACE Wardha, Maharashtra, India, [pratikpathak3003@gmail.com](mailto:pratikpathak3003@gmail.com)*

<sup>2</sup>*Student, Mechanical Engineering, SSPACE Wardha, Maharashtra, India, [vidyanand24m@gmail.com](mailto:vidyanand24m@gmail.com)*

<sup>3</sup>*Student, Mechanical Engineering, SSPACE Wardha, Maharashtra, India, [sidhantkhadse3@gmail.com](mailto:sidhantkhadse3@gmail.com)*

<sup>4</sup>*Student, Mechanical Engineering, SSPACE Wardha, Maharashtra, India, [waghmaresaurabh109@gmail.com](mailto:waghmaresaurabh109@gmail.com)*

<sup>5</sup>*Student, Mechanical Engineering, SSPACE Wardha, Maharashtra, India, [rajatosharma143@gmail.com](mailto:rajatosharma143@gmail.com)*

<sup>6</sup>*Student, Mechanical Engineering, SSPACE Wardha, Maharashtra, India, [lokhanderoshan8@gmail.com](mailto:lokhanderoshan8@gmail.com)*

<sup>7</sup>*Student, Mechanical Engineering, SSPACE Wardha, Maharashtra, India, [surajwankhede256@gmail.com](mailto:surajwankhede256@gmail.com)*

### ABSTRACT

Sugarcane is the main source of sugar in Asia and Europe. Sugarcane is the raw material for the production of white sugar, jiggery (gur) and khandsari. It is also used for chewing and extraction of juice for beverage purpose. The sugarcane cultivation and sugar industry in India plays a vital role towards socio-economic development in the rural areas by mobilizing rural resources and generating higher income and employment opportunities. About 7.5 percent of the rural population, covering about 45 million sugarcane farmers, their dependents and a large number of agricultural labors are involved in sugar cane cultivation, harvesting and ancillary activities. There are several methods for sugarcane bud cutting. It is by manually, and also by the use of machines. Manual bud cutting with hand knife is a common practice. These traditional tools used for bud cutting of sugar cane are unsafe, messy, minimum productive and need skill and training. The risk of injury is also too high. This necessitates the development of an automated sugarcane bud cutting machine. There is problem of initial growth using the sugarcane bud but it can be overcome using the suitable growth regulators and fertilizers. Also this machine faster production rate which make it suitable for the competition with conventional sugarcane bud cutting machine.

Keywords: Cutting Blade, Sugarcane Bud Cutting Machine, cutting Bud, Pulley, 3 Phase Electric motor, Cam, Safety Operation

\*\*\*

### 1. INTRODUCTION

The main objective of our project is to perform job holding and cutting operations effectively with less human effort by incorporating a machine with the electric power with multicutter. This also takes less time due to its quick action. This electric sugarcane bud cutting machine aims to provide a better and faster bud cutting operations with less human effort thereby promoting agricultural activities of sugarcane cultivation. Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. To achieve mass production, the automation of the predefined tasks is necessary and is made mandatory in the current operating conditions of the industries. One alternative to reduce the mass and improve the quality of seed cane would be to plant excised axillary buds of cane stalk, popularly

known as bud chips. These bud chips are less bulky, easily transportable and more economical seed material. The bud chip technology holds great promise in rapid multiplication of new cane varieties. The sowing of buds of grown sugarcane ensures the growth of new sugarcane thereby increasing the production rate and decreasing the damaging rate of the sugarcanes. The left-over cane can be well utilized for preparing juice or sugar or jaggery [1]

### 2. LITERATURE REVIEW

2.1 Yogesh S. Lingayat, Mechanical Department, S.N.D. College of Engineering & Research Centre, Maharashtra, India it design and fabricate sugarcane bud cutting machine with help of pneumatic power, but there is noise of compressor and it also required lubrication as well as Cooling

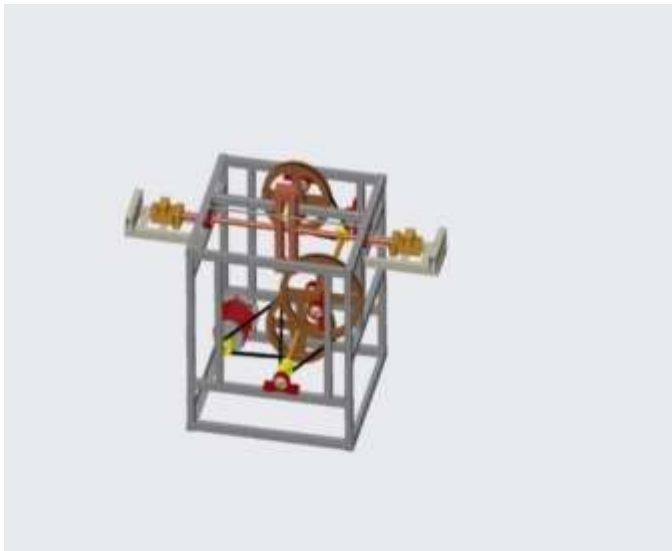
system. we neglect the pneumatic system and we use 3 phase motor which is easily available

2.2 A.A. Tamboli Mechanical Department, Savitribai Phule Pune University, TSSM'S, Padmabhusan Vasantdada Patil Institute of Technology, Pune, it is based on electric circuit to cut sugarcane bud and there use of belt conveyor but in actual practice the road condition of form is not suitable for this project hence we design a portable bud cutting machine with multicutter

### 3. METHODOLOGY

**3.1 Definition of problem:** It has been observed in rural areas most of the people cut the sugarcane buds manually. This consumes a lot of sugar cane and time to cut the buds. In order to identify this cause we have designed and fabricated the sugar cane bud cutting machine which works on electricity. It reduces about 70% of seeding cost. And get more yield The machine reduces tremendous labour and produces more number of buds in less time. It will prove one of the good ideas for the farmers.

### 4. DESIGN OF MODEL



### 5. DESIGN FUNDAMENTAL

• Basic part selection and designing: Following are important part which is to be design or selected:

1. Frame

2. Belt
3. Pulley
4. Cutting tool
5. shaft

**5.1 Frame:** Frame is the basic structure for support the main component like belt, 3 phase motor, cutting tool etc. Frame should be selected with suitable dimensions and material. Mild Steel (M.S. bar) is most convenient material for frame.

**5.2 Pulley:** pulley use for speed reduction and to transmit motion.

**5.3 Belt:** Belt is used to transmit rotary motion of motor to pulley.

**5.4 Cutting Tool:** It is use to cut sugarcane bud.

**5.5 Shaft:** It is used to transmit power as well as torque.

**Table-1: COMPONENTS AND SPECIFICATION**

Parts	specification	Quantity
3phase motor	1440 RPM	1
Pulley	304.8	2
Pully	63.5mm	1

### 6. WORKING OF MODEL

The machine is powered by electrical 3 phase motors which run at 1440 rpm. V belt drive and pulleys are used to reduce the speed to 40 rpm. The rotary motion of motor is converted into reciprocating motion by using cam and follower. The two vertical cutters are moves vertically and provides the return stroke of the cutters. plate used to guide the cutter. The sugar cane feed on the plate form which buds are cuts. All these are placed on the container which is placed below the cutter. The rest of the canes can be sold to sugarcane juice venders and to the factory. The chipped buds were treated with chemical solution to prevent any disease infestation in the resulting plants and were filled into gunny bags

### 7. OBJECTIVES

A. To develop machine which have proper control on cutting location so cut cannot appear on node and cut maximum nodes at minimum time so efficiency will be increased.

B. To reduce the human effort required for sugarcane planting by developing automated sugarcane node cutting machine.

C. To minimize the node cutting time.

D. To reduce number of sugarcane stalk required per hectare.

E. To plant sugarcane with proper spacing.

F. To reduce the labour cost.

G. To increases the growth of the sugarcane.

## 8. ADVANTAGES

- A. It reduce the labour cost
- B. It reduce human effort for bud cutting
- C. It plant sugarcane with proper spacing
- D. It reduce number of sugarcane stalk required per hectare
- E. It minimize the node cutting time.
- F. It increases the growth of the sugarcane

## 9. CONCLUSION

This automatic node cutting method is a time saving and economical alternative for reducing the cost of sugarcane production. Normally, 5 to 6 tons of sugarcane is required for planting an acre of land if 16000 budded stalks are used (approximately). However, if node cutting is used only 140-150 Kg is sufficient resulting in a saving of about 97% of cane by weight. This is economical in terms of the crop cultivation cost. It also saves several thousands of tons of raw material since the de-budded stalk could be sent to crushing centers for extracting sugar. Also this automatic plantation reduces the human effort and also provides proper spacing.

## REFERENCES

- [1] A.A. Tamboli, S.V. Phapale, P.V. Patil, K.B. Sapkal, R.N. Yannawar "Design and Fabrication of Automated Sugarcane Node Cutting " International Engineering Research Journal (IERJ), Volume 2 Issue 9 Page 3802-3805, 2017 ISSN 2395-1621

[2] Ningappa H Kuri, Prof. Reddy Naik. J Design and Development of Sugar Cane Bud Chipping Machine ISSN 2321-304, 2014

[3] Tejaswi Patil, Parth Ransubhe, Durga Tatke "Design and Development of Sugarcane Bud Cutting Machine", International Research Journal of Engineering and Technology (IRJET), Volume: 05 Issue: 04-Apr-2018, e-ISSN: 2395-0056, p-ISSN: 2395-0072