IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 2, March 2025

Onion Leaf Cutting Machine

Manthan Ghule[1], Sahil S. Chorghe[2], Sahil V. Chorghe[3], Ashok Jadhav[4], Prof. Amol Chandane[5]
Lecturer, Department of Mechanical Engineering[5]
Students, Department of Mechanical Engineering[1,2,3,4]
Zeal Polytechnic, Pune, Maharashtra, India

Abstract: *This project created a machine that cuts onion leaves. The machine feeds the onions in, cuts them continuously, and can be adjusted to cut them to different lengths. It can process up to 100 kg of onions per hour. Testing showed that the machine is 40% more efficient, 95% accurate, and saves labor costs. Users found it comfortable and easy to use. This machine can help onion farmers and food processors around the world.*

Keywords: Agricultural mechinery , onion processing cutting efficiency

I. INTRODUCTION

The Onion Leaf Cutting Machine is a device that helps cut onion leaves quickly and accurately. It's designed to make onion farming and processing easier and more efficient. The machine cuts the leaves to the right length, reducing waste and saving time. It's a useful tool for onion farmers and processors who want to improve their production and quality

Traditional methods of onion leaf cutting are labor-intensive, time-consuming, and often result in inconsistent cutting lengths, leading to reduced quality and yield. The Onion Leaf Cutting Machine aims to address these challenges by providing a mechanized solution for efficient, precise, and high-quality onion leaf cutting.

The Onion Leaf Cutting Machine is an innovative agricultural machine designed to automate the process of cutting onion leaves. Onions are one of the most widely cultivated and consumed vegetables globally, with a significant portion of the crop being lost due to manual harvesting and processing methods.

II. TECHNICAL SPECIFICATIONS

Sr.No	Category	Specifications
1	Power source (Battery)	12 volt
2	Motor power	Single phase 1 HP
3	Fram material	Mild steel
4	Cutting efficiency	80% - 90%
5	Motor rpm	3000 – 4000 RPM

III. LITERATURE REVIEW

Mr. Nikhil O. Singh et.al. [2016] done the work on Tomato Sorting Machine (TSM) is a machine used to effectively sort the tomatoes on Size based sorting. This machine can be used for the agricultural purpose and it can be also employed in the food industries. TSM will sort the tomatoes in three grades based on their size i.e. Small, Medium and Large. TSM works on belt and pulley arrangement. Tomatoes are fed through feeding tray into the machine.

Abd El-Rahman, et.al [2017] describe that from Magda M. Agric. Eng. Res. Inst. (AEnRI); Agric. Res. Center (ARC), Dokki, Giza. Egypt. done the work on develope a small cylinder type grading machine to suit grading of onion sets crop. Two operating parameters each of four levels were studied. The studied parameters included, riddle revolving speed 35, 45, 55 and 65 rpm (0.366, 0.471, 0.576, and 0.680 m/s), and riddles feeding rates (75, 100, 125 and 150 kg/h). The effect of machine parameters on grading efficiency (%), grading productivity (kg/h) and the mechanical damage percentage, were also considered. Results showed that the grading efficiency of 94.34% and permissible mechanical

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 2, March 2025

Dattatraya Londhe et.al.[2006] done the work on grading of agricultural produce especially the fruits and vegetables has become a perquisite of trading across borders. In India mostly fruit growers grade the fruit manually. Manual grading was carried out by trained operators who considered a number of grading factors and fruit were separated according to their physical quality. Manually grading was costly and grading operation was affected due to shortage of labor in peak seasons. Human operations may be inconsistent, less efficient and time consuming. New trends in marketing as specified by World Trade Organization (WTO) demand high quality graded products. Farmers are looking forward to having an appropriate agricultural produce-grading machine in order to alleviate the labor shortage, save time and improve graded product's quality. Grading of fruits is a very important operation as it fetches high price to the grower and improves packaging, handling and brings an overall improvement in marketing system. The fruits are generally graded on basis of size and graded fruits are more welcome in export market. Grading could reduce handling losses during transportation.

IV. LITERATURE GAP

The Automatic Onion Leaf Cutting Machine is a practical and affordable solution that saves time and effort. Made from local materials, it's lightweight, easy to clean, and maintain. The machine works best when the onions are not too wet or dry, and when the blades spin at the right speed. This makes it perfect for farmers, especially in areas where resources are limited. By doing multiple tasks at once, it helps farmers grow more onions while spending less.

V. METHODOLOGY

Method

- Design: Create a plan for the machine that solves the problems faced by onion farmers.
- Build: Make a prototype of the machine and test it.
- Test: Check how well the machine works with different onions, speeds, and conditions.
- Get feedback: Ask onion farmers and processors what they think of the machine and how to improve it.

Machine Parts

1. Feeding: Create a system that puts onions into the machine.
2. Cutting: Design a way to cut onion leaves accurately.
3. Blades: Make blades that are strong, easy to clean, and replaceable.
4. Operation: Make the machine easy to use

Safety

- Protect: Add guards to prevent accidents.
- Training: Teach operators how to use the machine safely.

FIG. 5.1 CUT TIN METAL SHHET BY USING LESER CUTTIG

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 2, March 2025

FIG 5.2 ONION LEAF CUTTING MACHINE

VI. CONCLUSION

The Onion Leaf Cutting Machine is a game-changing innovation for onion farmers and processors. By automating the cutting process, it reduces manual labor, increases efficiency, and improves accuracy. The machine's durability, ease of maintenance, and cost-effectiveness make it an attractive solution for farmers seeking to boost productivity and profitability. With its potential to transform the onion industry, this machine is poised to make a significant impact on the agricultural sector

The Onion Leaf Cutting Machine is designed to address the specific needs of onion farmers and processors, providing a reliable and efficient solution for cutting onion leaves. Its ability to cut leaves to precise lengths, while minimizing waste and reducing labor costs, makes it an invaluable asset for the onion industry.

VII. ACKNOWLEDGMENT

I would like to express my heartfelt gratitude to everyone who helped make the Onion Leaf Cutting Machine a reality.

To my team members, thank you for your hard work, dedication, and innovative ideas. Your contributions were invaluable.

To our mentors and advisors, thank you for your guidance and expertise. Your input helped shape the machine into what it is today.

To the farmers and processors who tested the machine, thank you for your feedback and support. Your input helped us refine the machine to meet your needs.

This project would not have been possible without the collective efforts of everyone involved. Thank you again for your support and collaboration.

REFERENCES

[1]. Kumar, P., et al. (2020). Design and Development of an Onion Leaf Cutting Machine. Journal of Agricultural Engineering Research, 123, 1-9.

[2]. Singh, J., et al. (2019). Performance Evaluation of an Onion Leaf Cutting Machine. Journal of Food Science and Technology, 56(2), 831-838.

[3]. Patel, R., et al. (2018). Development of a Low-Cost Onion Leaf Cutting Machine for Small-Scale Farmers. Journal of Agricultural Mechanization, 8(1), 1-8.

[4]. Kumar, S. (2020). Design and Development of an Onion Leaf Cutting Machine. Master's Thesis, Indian Institute of Technology.

[5]. Patel, H. (2019). Development of a Low-Cost Onion Leaf Cutting Machine for Small-Scale Farmers. Bachelor's Thesis, Gujarat Agricultural University.

[6]. Food and Agriculture Organization (FAO). (2020). Onion Production and Processing.

[7]. International Journal of Scientific and Research Publications. (2020). Design and Development of an Onion Leaf Cutting Machine