

1.	Title of the project: DESIGN AND FABRICATION OF TRIANDRA ARECA NUT DEHUSKING MACHINE
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5.	<p>Key words:</p> <ul style="list-style-type: none"> • Dehusking • Agricultural machinery • Mechanical design • Husk Remval
6.	<p>Introduction</p> <p>The trindra dehusking machine is a specialized agricultural machinery designed to efficiently remove husks from trindra arecanut and by enhancing productivity, labor-intensive manual dehusking, and improving overall grain quality. the context of this specific project, previous work has been conducted to address the challenges associated with traditional dehusking methods. Extensive research and development have focused on optimizing the dehusking process to ensure minimal grain damage and high dehusking efficiency.</p>

The project aims to build upon existing designs and technologies, incorporating innovative features to enhance performance and usability. Key considerations include improving automation, streamlining the dehusking process, enhancing grain separation mechanisms, and ensuring operator safety.

The team involved in the project has leveraged their expertise in mechanical engineering, material science, and agricultural technology to develop a robust and efficient triandra dehusking machine. The design incorporates advanced control systems, precision engineering, and high-quality materials to ensure durability and long-term reliability.

Previous prototypes and iterations have undergone rigorous testing and evaluation to optimize performance and address any design flaws. Valuable insights from field trials and user feedback have been integrated into the current design, allowing for continuous improvement and refinement.

7. Objectives

The Prime Objective of the Report is to present a Viable Bankable Model of “Triandra arecanut dehusking unit ” through adoption of appropriate technology, utilization of resources, quality production and suitable market strategy.

Some important objectives behind setup of “Triandra Arecanut dehusking unit” are:

- The objective of the project is to develop a machine for dehusking of triandra Areca nuts.
- These problems can be overcome by developing a machine which can efficiently and economically husking the triandra Areca nuts
- This system especially beneficial for triandra (Ceylon) areca formers
- The machine should be able to accommodate different sizes of triandra Areca nut and it must also be easy to operate, eliminating the need of skilled labour.
- Less breakage of triandra while dehusking.

8. Methodology

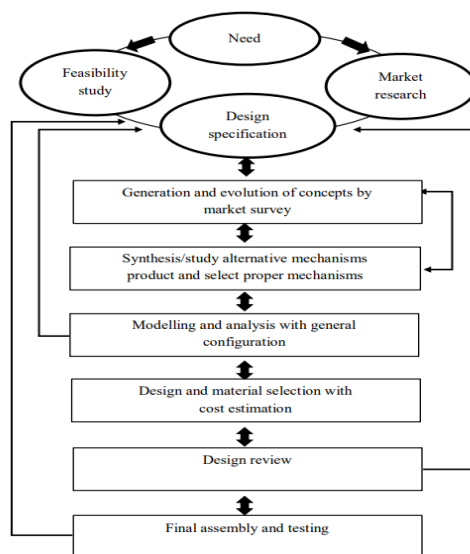


Fig.3.1: Block Diagram

The project called design and fabrication of Triandra areca nut dehusking machine is started with planning and need of public aspects such that we made the plan to design it. Initially we started with survey of machines which is not yet design for agricultural purposes. So, we planned to design a dehusking machine for Triandra areca nut

8.2 Concept 1: - Using Blade and Mesh

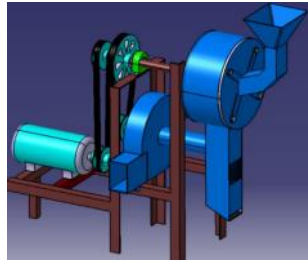


Fig.:8.2 Using blade and mesh

In this design we fixed the two blades to rotating shaft having a metal piece which are perpendicular to each other. The mesh with low thickness is cylindrical in shape fixed to the chamber. Two circular plates are used to cover chamber.so that we reduced the vibration of the chamber using Plummer blocks. From this method we **breakage of Arecanut and also production rate less for that we change the design.**

8.3 Machine Design

Machine design is defined as the use of scientific principles, technical information and imagination in the description of a machine or product or mechanical system to perform specific functions with maximum economy and efficiency.

Concept 2 : - Using Blade with rubber and mesh

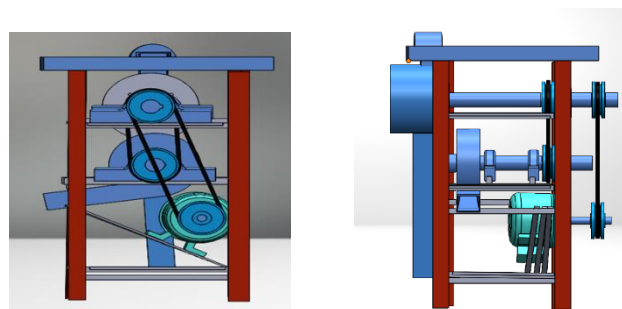


Fig 8.4.1 : - 3D Model

Major components

- | | | |
|---------------|---------------------|-------------|
| 1. 3D Model | 3. Blower | 5. AC Motor |
| 2. Belt drive | 4. Pedestal Bearing | |

2. Belt Drive

A belt and pulley system is characterized by two or more pulleys in common to a belt. This allows for mechanical power, torque, and speed to be transmitted across axles.

3. Pillow Block

A pillow block usually refers to a housing with an included anti-friction bearing, wherein the mounted shaft is in a parallel plane to the mounting surface, and perpendicular to the centre line of the mounting holes

4. Blower

The blower is used to suck the air from atmosphere for use full work, here we use in the blower blow fan it will be rotate clockwise direction, it blow the air with help of four vertical plate that plate connected to a long shaft.

These are the Major components of our project, and we use the some of the **materials** that are

1. Angular rods: Angular rods typically have an "L" or right-angle shape, providing structural reinforcement and stability .

2. Mesh: Here we designed round the sheets is made up of aluminium. They come in 1mm thicknesses.

3. Rubber: Inside the Rubber, there are layers of fabric or steel cords, Which is little Flexible and Which is fixed to the shaft for feed the arecanut.



Fig : 1.1 Angular rod



Fig : 2.1 Mesh



Fig : 3.1 Rubber

9. Final Assembly of Machine

All the components are fabricated and assembled together on the frame in their designed position. The frame houses all the components like Motor, Centrifugal Blower, Bearings, pulleys, crushing Drum and crushing Rotor. The Motor, Centrifugal Blower and Bearings are mounted on to frame using thread fastening method i.e., using Bolts and nuts. Finally, the machine is painted and is as shown in figure 9.1.



fig 9.1 : Final Assembly of Machine

Results and Conclusions

In this research work, Triandra areca nut dehusking and seed extracting machine were developed. This automated machine contains high end performance which meets customer's satisfaction after the fabrication. The modelling of extraction machine which contains easy way to develop by standardized parts which are easily available in the market.

10.1 Advantages

- Production rate is high compared to manual process.
- No skilled labours are required.
- Reduces human stress and time consuming is less.
- During the process vibration is less and is portable.
- Load Adjustable.
- No breaking of arecanut.

10.2 Disadvantages

10.2.1 It is not a multipurpose machine.

10.3 Applications

10.3.1 Triandra areca nut farming.

10.3.2 Domestic application.

Conclusion

The Triandra areca nut machine is developed and tested successfully. As per the test result it is found that the production rate of the laborers increased from 20Kg/hr to 25Kg/hr. By this mechanism the extracted nut will have the least damage. The rate of damage is decreased considerably and can be neglected. Also the safety of the operator is enhanced. By this project we have designed a mechanism to extract the Triandra nut from areca husk. It is found that the effort require to husk the Arecanut by the traditional method will be more than machining. This machine is very much helpful for consistent working and portability.

11 What is the innovation in the project?

Adjustable settings: Advanced machines allow for adjusting the dehusking settings to accommodate different Load sizes for products. This flexibility ensures optimal dehusking results for various agricultural commodities.

Improved husking mechanisms: Innovations have been made to enhance the efficiency and effectiveness of the dehusking process. This includes the use of advanced mechanical mechanisms, such as rollers, abrasives, or blades, designed to remove the husk while minimizing damage to the underlying product.

Waste reduction: Innovations have focused on minimizing waste generated during the dehusking process. This can involve improvements in husk collection and disposal systems, as well as mechanisms to extract any valuable by-products from the husk itself.

Future Score

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- The main scope of our project is to make the farmers to improve the plantation.
- By this project the farmers can make their own machine to dehusk the Triandra areca nut with their plan.
- The production rate will increase with the help of this machine.
- The design can be incorporated and devolved for processing unit for larger weightof areca nut