

# Rice Seeds Separation Machine

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**Abstract** - In this project Portable Paddy Cleaning Machine is designed to remove foreign materials and impurities such as sand particles, stones, paddy straws and foreign seeds from paddy. This machine provides farmers an alternative replacement of current conventional method should the farmers want to extract the paddy seed in small scale amount. Currently, they only use a traditional winnow technique as to obtain the seeds to be used next season or before processing paddies to become rice. The performance of this machine is very efficient where the percentage of clean paddy is observed to be at 95%. It helps farmers improvise their traditional method, reduces purchasing cost of paddy seed and utilizes the cleaning process at low cost and less maintenance.

**Key Words:** Seed Separation, Foreign Materials, low cost, Less Effort, Seed Purity

## 1. INTRODUCTION

Seed separation and cleaning is the most important processes for obtaining pure high-quality seeds. By properties like physical, electrical, magnetic, optical viz seed separation can be carried out [2]. Currently, farmers are separating seeds by their hand and in this process breaking of grain occurs. Hence, Indian farmer needs a product that is safe, feasible, low cost and productive [1]. The objective of this research was to design the machine for separation for rice seeds [3]. Rice is one of the most important grain in India. It is the staple food of the people in the eastern and southern parts of the country. India is one of the world's largest producer of white and brown rice and produces 20% of the world rice production. As rice is the basic food crop and being a tropical plant, it flourishes comfortably in hot and humid climate. It is mainly grown in rain fed areas that receive heavy annual rainfall and thus it is fundamentally a Kharif crop in India. It demands temperature of around 25 degree Celsius and above and rainfall of more than 100cm. Rice is used in manufacturing of alcohol, starch, glucose, acetic acid, vinegar, acetone, oil and pharmaceutical products and diet foods.

### 1.1 Objectives

To develop a machine having following advantages:

- It takes less time for separating.
- It takes less man power.
- Easy to operate for people.
- Having simple in mechanism.

- Having less cost.

### 1.2 Scope

1. Make possible more uniform planting rates by proper sizing.
2. Improve seed marketing by improving seed quality.
3. Prevent spread of weed seed.
4. Prevent crops from disease by applying chemical protectants.
5. Reduces seed losses by drying.

## 2. Methodology

### Constructional Features

Details of the different parts of rice seed separation machine

#### Frame:

The frame will be made up of mild steel. Considerable Dimensions: -

- Length of frame = 1700 mm
- Length and width of each section = 500 mm & 450 mm resp.
- Frame supported by 4 legs having c/s area = 25 mm x 25 mm

#### Shafts:

The shafts will be made up of mild steel. Considerable diameter of 15 mm. There are 2 shafts, one at upper end and other one at lower end.

#### Meshes:

Different sizes of mesh will be used for different sizes of grain. For Basmati rice, upper mesh having dimension of 8 mm x 8 mm & lower mesh having dimensions 7 mm x 7 mm

#### Pulley:

Pulley will be made up of mild steel. Considerable dimensions of pulley: -

- Diameter of larger pulley = 27 mm
- Diameter of smaller pulley = 22 mm

- Centre distance = 150 mm

**Lever:**

Lever will be made up of mild steel. Considerable dimensions of Lever: -

- Width of lever cross section = 10 mm
- Depth of lever cross section = 30 mm

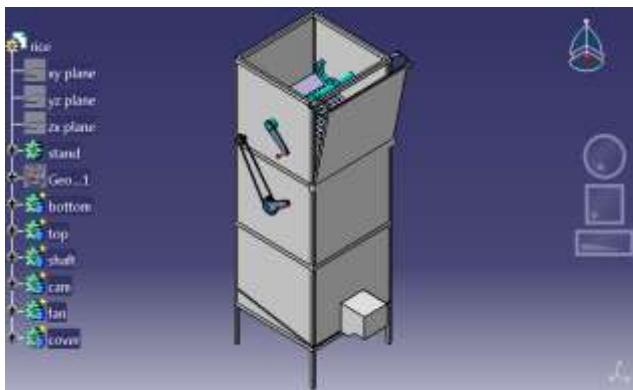
**Bearing:**

6202 (Deep groove ball bearing having bore dia. 15 mm)

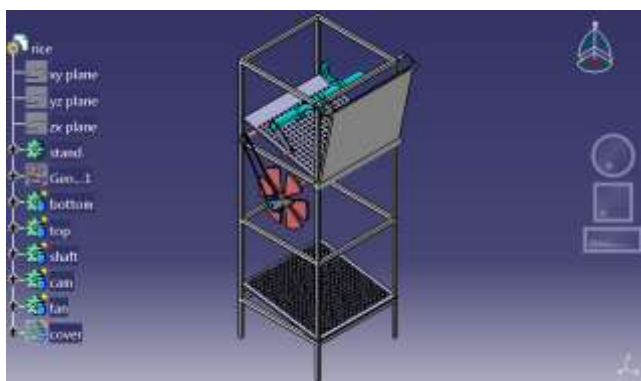
**Belt & Fan:**

V-belt will be used. Fan is used for removal of unwanted matter.

**3. Design Model & Working**



**Fig -1:** Actual Design Model



**Fig -2:** Isometric View of Design Model

Rice crops will be mounted on upper end shaft. As the farmer rotates the lever, shaft and fan rotates. These crops are bumped on to the inner side of frame and upper mesh. After threshing, rice seed will be separated from upper end mesh. The fan which is below of upper mesh helps to separate waste and unwanted matter by means of air. Finally, we obtain rice seed by separation of lower end mesh.

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**4. Future Scopes**

- By using Scotch Yoke Mechanism, we can rotate shaft & fan and also vibrate upper mesh at the same time by rotating single lever.
- We can use motor for rotational purpose and reducing human efforts.
- We can arrange meshes in such a way that they are oppositely inclined to each other. Due to this effective waste removal from machine takes place.

**5. CONCLUSION**

After reviewing work of different authors as above it can be easily concluded that farmers can use this machine for rice seed separation. Time taken by this process for rice seed separation from husk will be reduced. By using this machine, we will reduce man power. This machine is very easy to operate by farmers. It is having simple mechanism in it. This machine will be available at less cost.

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