

DEVELOPMENT OF GROUNDNUT POD SEPARATOR

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Abstract - In India, Agriculture is the backbone. In country like India, groundnut is grown on a small scale by farmer. The major problem in groundnut production in country like India is the lack of groundnut processing machines available to farmers. In the beginning the groundnut pods were separated from its plants by the workers. They simply remove groundnut pods by their hands and separate from the plants. The output got from this method, was very low because it was very time consuming process. It was also a boring work for the worker. Traditional method of separating pods from groundnuts plants by hands. That the traditional method is not a sufficient method for separating the groundnut pods. Due to this manual process, identify some major problem & to over-come this problems some idea or concepts generates.

Key Words: Farmer, Pod separation, Traditional method of pod separation, Manual pod separation, Automatic pod separation

1. INTRODUCTION



Fig.1 Groundnut Pods Plant

Groundnut is the sixth most important oilseed crop in the world. The production of groundnut is concentrated in Asia and Africa (56% and 40% of the global area and 68% and 25% of the global production, respectively). India is an agricultural based country. Since last 50 year's lot of changes has been occurred in agriculture sector. Many new agricultural based industries have been started new varieties and species of plant have been discovered. In our country most of the people can be depend on the agriculture sector/field.

The Groundnut is one of the major seed crop. This product in the cultivated in abundant quantity. There is lot of time waste in old method of groundnut pod separating. The time required for 1 Kg of groundnut pod separating from this groundnut is about 1/2 to 1 hour. So we have produces new machine for fast groundnut pod separating. The traditional

manner of stripping groundnut pods is by removing by fingers or hitting the bunch of nuts with rods. Both the traditional methods cause injuries to the fingers of farm women and damage of nuts which can then be used only for oil expelling purposes. Stripping of groundnut in this manner needs 30 women labour per acre and it is tedious to the farm women. The fields need to be made wet the previous day with scant irrigation, so that the soil becomes loose and the plants along with the pods can be pulled out easily from the soil. Once plucked, the pods need to be stripped from the shell. Stripping the pods is a traditional practice done either by removing the pods manually or hitting the bunch with the help of rods.

2. LITERATURE REVIEW

As per Mr. Arjun Vishwakarma, Tejas Tandale, Prof R. H. Kekan who mainly focused on the design and development of a groundnut pod separating machine electrically powered by a 1hp motor. In the beginning the Groundnut pods were separated from its crop by the workers. The output got from this method, was very low and it does not fulfill the market demand because it was very time consuming process. Our project mainly consists of robotic arm and spiked rotating drum. Robotic arm will pluck out the groundnut crop and feed it on the spiked rotating drum. Spikes on rotating drum will separate the pods from ground crop. There are big Groundnut Harvesters available in market, but farmers having small farm area can't afford that harvester. Our machine is small, lightweight, and low in cost. Farmers having small farm area can afford and use our machine. [1] According to Mr. Deshmukh Shubham, Mr. Giramkar Harshawardhan, Mr Kadam Bharat, Mr. Jedhe Shubham, Mr. Adhapure D.U. says in their paper about the design and fabrication of a groundnut shelling and separating machine electrically powered by a 1hp motor. The machine has the capacity of shelling 400kg of groundnut per hour with a shelling and separating efficiencies of 95.25% and 91.67% respectively. The machine was fabricated from locally sourced materials, which makes it cheap and easily affordable and also easy and cheaper to maintain. It is also of light weight and comprises of the hopper, crushing chamber, separation chamber and the blower unit. During the process of testing, it was observed that majority of the groundnut pods that came out unshelled or partially shelled were the ones with one seed per pod and those with two small seeds in their pods. [2]

As per Mr.Sanjay Patil, Harshkumar Jain, Jayshree Raut, Tushar Kalikate, Viraj Gandhi Chaff cutter is hay or straw cutting machine which is used in uniform chopping of the fodder for livestock or raw material to agro industries.

The various types of food can be processed in this machine are forage grass, green grass, dry corn stalk, and wheat stalk. The final products can be used to feed cattle, goats, deer, and horses. It can also process cotton stalk, bark, small branches; they can also be used to generate electricity, and to make paper. Chaff cutters have developed gradually from the basic machines into commercial standard machines that can be driven at various speeds so as to achieve various lengths of cuts of chaff with respect to animal preference type. [4]

3. OBJECTIVES OF THE MACHINE

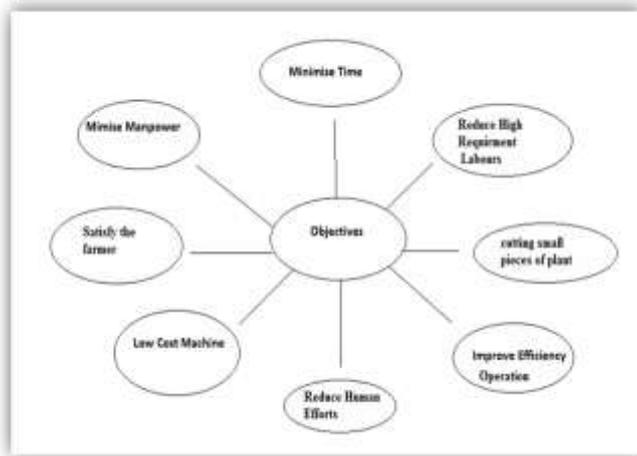


Fig.2 Objectives of Machine

- To minimise the time for separating the groundnut pod from plant body.
- To minimise manpower.
- To simplify the process.
- To improve efficiency of operation of separation of groundnut pods from plant body.
- To develop a low cost machine this can be used by farmer
- It satisfies the need of village people to earn more money.
- The aim of project is to design & develop a low-cost groundnut pod separator which will help farmer to reduce time required to separate groundnuts.
- To reduce human efforts.
- To increase efficiency and get more profit.
- To reduce high requirement of labours.
- To modify the design of chaff cutting machine which can allow the farmer to not only cut the sugarcane in a form which can be utilized as a fodder for animal but can also grind various feeding materials such as dry corn straw, grass, soyabean, wheat stalk, with ease and thus reducing the manual work of farmer and increases the fodder production.

4. INITIAL CONCEPT

Introducing low cost automation was to overcome problems with the current manual traditional method. The concept of the work is,

- (1) Observe the manual methods to identify the important process variables.
- (2) Quantify the important method.
- (3) Develop a prototype automation system which could control over all of the process.
- (4) Investigate all areas of automated forming.

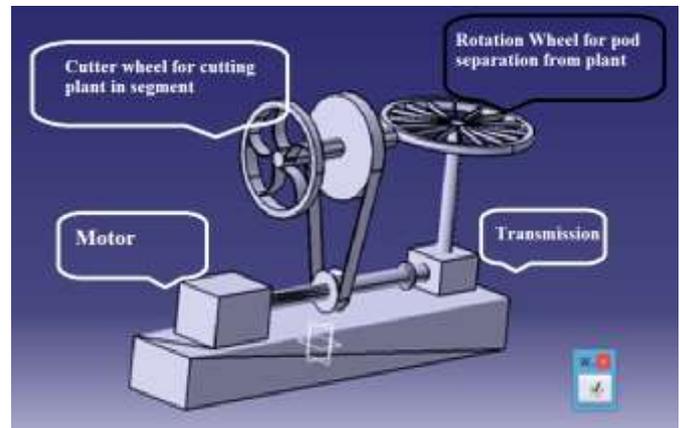


Fig.3 Conceptual Drawing of Pod Separator Machine

5. CONCLUSION

By Developing such type of machine it is helpful to farmer those having small amount of land to separate the groundnut pod from plant with less effort as well as by just changing the blade the same machine can be used for sugarcane cutting.

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