REVIEW PAPER ON PADDY CULTIVATION

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Abstract

Agriculture is a very important in day to day life. It is the way of life through which life is sustainable on earth. Among all types of crops, paddy is widely grown in southern and eastern parts of India. It is staple food crop which needs a minimum temperature of 25 degrees Celsius and 115 cm of rainfall. Generally, cultivation of paddy involves preparation of field, transplantation, field maintenance, harvesting and threshing. These steps involve in the heavy use of labours and more time for cultivation which in turn result in less production. But instead of labours, introducing of mechanical methods to the farmers means practising of mechanised agriculture will help the farmers to replace the manual labour and increase the production.

Keywords: Sustainable, mechanization, harvesting.

1. INTRODUCTION:-

Rice is one of the important food crop of India. The most commonly used methods are transplanting and direct seeding. Due to high yielding transplanting method is popularly used. [1]. Selection of seed plays a major role in yield of crops. Selecting the seeds form a government authorized dealers, which are free from weeds, resistance to seed-borne diseases, insects, pathogens, and other extraneous matter. Undesirable seeds that are too small, spotted, deformed or discoloured should not be chosen for planting. [2]. For proper yielding of crops the nutrient content, acidity, pH level of the soil should be tested. The main necessity for the testing of soil is to increase the yield, as well as reduction of fertiliser’s usage. The Nitrogen-soil test for rice is a newly developed soil-based test that will be available to the growers for
rice production on slit loam soils.[3]. For planting the field preparation plays a major role. By ploughing the nutrient content in the soil will be re-distributed. A well ploughed land controls weeds, provides a soft soil mass for transplanting and a suitable soil surface for seeding. Ploughing of land includes different practices from zero – tillage, ploughing, harrowing and levelling. [4] Basically paddy crops is planted two ways one by direct seeding and other by transplanting one month old nursery. Transplanting is more advantageous as it has very low weed growth and less time period required for them to grow in the fields. Generally the transplantation can be done manually and by using the machines. By manual transplantation it needs 5 people per acre for one day. By using machinery it takes maximum of 2 hours for an acre.[5]

2. PLANTATION

Mechanical rice trans-planter is cost effective and operation friendly.it helps in maintaining soil physical properties and is consider to be better from crop management and productivity point of view. Among the mechanical rice trans-planter there are 4row, 6row and 8row types are available.

Generally the crop is cut by using sickles. Initially the crop is being dried. Then the crop is made in to bundles (STACKING/PILING). Then seeds are separated by hitting the bunch of straws to a rigid body. Then finally the seeds are separated from the stones and dust particles, by using wind and gravity. At last the seeds are bagged and stored.[6] The crop is cut by using reapers. Initially the crop is being dried. Then the crop is made in to bundles (hauling). Then these bundles are brought to the threshing location (stacking). The seed are separated from the straws by using tractors (threshing). Then finally the seeds are separated from the stones and dust particles, by using winnower. At last the seeds are bagged and stored.[7] By using combined harvesters, cutting, hauling, threshing and cleaning can be done by a single machine.

Capacity: an acre per hour

Labour requirement: 1 person.

Hence the use of automated machines will help in the reduction of labour and save time. And also help us in increasing the production.[8]
While using machinery the following parameters to be considered.

- Don’t plough the land more than 7cms for machinery transplantation.
- Use levellers to level the land before plantation for even distribution.
- Let the mud settle for 24-36 hours at least before transplantation.
- Maintain 3 to 5 cms of water level during transplantation.
- Grow the nursery over the sheets in rectangular patterns for better efficiency.
- Avoid the stones and scrap over the nursery bed.
- Grow the nursery evenly.
- Transplant the nursery bed within 28 to 40 days for better plantation.
- Harvest the crop at the correct time to get high yield and maintain the moisture content in the seeds.

Harvesting can be done in three ways

1. **Manual harvesting:**

   Basically manual harvesting is done by using sickles. Sickles are used to cut the crop and then let the crop to dry for three to four days. after drying it is made into bundles(hauling)and then it is build into a circular or cone shaped heap with the bundles (stacking).now separate the grains from the straws by beating the bundles to a rigid body(threshing). Atlast removing of dust particles from the paddy grains is done with the help of airflow (winnowing).

2. **Semi-Manual Harvesting :-**

   The crop is cut with reapers connected to hybrid vehicles. let the crop to dry for three to four days. after drying it is made into bundles(hauling)and then it is build into a circular or cone shaped heap with the bundles (stacking). Threshing is processed by tractors, open drum thresher and closed drum thresher. Now , the separated grains containing scrap is separated using winnowers.
Paddy obtained by the Panicle Splitter machine which replaces 3-4 times dust separation as in manual method. Since there are several machines on the paddy field for the separation process. All these machines costs more than 4 lakh, which cannot be purchased by the formers. For all these reasons this panicle splitter machine developed with low cost around 30000/-. This machine can perform operations of paddy separation, major dust separation, and the minor dust separation from the work. This machine has high capacity of working, which can obtain output of 400-500kg of paddy per day which is larger than manual method.

3. Combined Harvesting :-

In which the cutting, threshing and winnowing of the crop are processed within the vehicle. Later the collected grains are dried under sun shade to get the required moisture content.

Features:
- Capacity : 4-8 ha/day
- Combines cutting , threshing ,
- Hauling ,cleaning.
- Tracks for mobility in wet fields.

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Fig. 1 panicle separator

Fig. 2 Design of paddy cultivation Machine
Conclusion:-

In this paper summarised about the manual, semi manual and automated paddy cultivation. It illustrates the cultivation process. In manual process, it consumes a lot of time and human efforts which results in the health problems. Most of the farming machineries are huge in size and are not compactable, not user friendly. By this we can conclude that the automated machineries are most efficient but these are not affordable by all the farmers due to high cost and lack of awareness and availability. Ultimately in future, researchers has to work on hybrid cultivation vehicles with low fabrication cost, eco-friendly as well as user-friendly vehicles.

References:


