

REVIEW ON RICE TRANSPLANTER

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Abstract - Horticulture area is the principle wellspring of food. This area additionally shapes nation's spine and gives business. With expanding populace, it is important to deliver food in a supported way. This can be refined by motorizing the cultivating activities. Another benefit of motorization is that it dodges the issue of work lack when required in the rush hour of land readiness and reaping. The region that an individual can plant around increments by utilizing this system. It likewise expands the yield through legitimate planning of land, crop insurance, proficient water system and limiting the misfortune during the collect. This paper centers around the motorization of rice planting. With this plan one can plant the seedling vertical to the ground at adequate profundity. This maintains a strategic distance from the removal of the seedlings as well as guarantees uniform maturing of the rice plants.

Key Words: rice transplanter, yield, labor

1. INTRODUCTION

Rice is an essential food for many people across the world. It is largely grown in many countries and is also a major crop in India, China and other countries of South-East Asia.

Agriculture plays an important role in the Indian economy. About one sixth of the GDP is occupied by the agricultural sector. The time and technology is been developing and changing day-by-day. Hence there is a need to develop the methods and the equipments too. The rice planting can be done in two main methods namely: i) Direct seeding and ii) Transplanting. In direct seeding, the seeds are sown (either by row seeding or broadcasting of germinated or non-germinated seeds) in the field under dry or wet condition at the beginning of rainy season. This method of seeding requires minimum labor and well suited for upland farms. However, it suffers from few limitations. The rate of germination of all seeds is not uniform; heavy rains extricate the seeds from the soil; seeds are vulnerable for birds. Due to these inherent demerits of direct seeding, transplanting method is preferred. In this method, saplings are raised in nursery or an open farm at least a month before planting. These saplings are then planted manually or mechanically in the soil. The advantages of transplanting are:

i) Saplings are planted at uniform spacing which aids in easy weed removal and intercultural operations

ii) Requires minimum amount of seeds relative to direct seeding

iii) Faster yields as the time dwell period of the crop in the land is reduced by 3-4 weeks

iv) All the crops ripe averagely the same time. However, the process is expensive, requires many number of labors and also requires highly skilled labor.

The objective of this paper is to review the rice transplanting methods, existing machines for transplantation and their merits and demerits. Based on the observations from the review, a new design is proposed which overcomes the limitations of the existing designs.



Fig(a): Traditional method of rice planting

A rice transplanter is a special type of machine fitted with transplanter mechanism having a reciprocating motion, in order to transplant the rice seedling into the fields. As we all

know that rice is a staple food of India, majority of the farmers are involved in the process of rice cultivation.

Generally cultivation of rice or any other crop requires number of skilled labors and majority of time. The process of rice transplantation is not so efficient as compared to the mechanized rice transplantation. Mechanized transplantation using rice transplanter considerably requires less labor than in manual transplanting and less time. Introducing the mechanism of the rice transplanter to the rice farming will result in a number of advantages.

2. LITERATURE REVIEW

S. Pradhan and S.K. Mohanty introduced. Relocating of paddy is dreary task generally finished by the female specialists during the kharif season and around 2020 the rate would be expanded from 42% to 50 percent womens working as of now. Physically worked hand relocating burns-through a great deal of energy and time and brimming with weakness. In any case, poor financial conditions will not permit them to embrace the force worked transplanter. Relocating activity by various examination communities have been developed as 2 lines, 3 columns, 4 rows, etc paddy transplanter.

In 2013 Rampuram Jayapal reddy & Dr. N. Sandhya Shenoy led a financial examination of Traditional SRI (System of Rice Intensification) rice development rehearses in Mahabub nagar area of Andhra Pradesh. It was presumed that the SRI strategy for development is worthwhile to the paddy ranchers when contrasted with Traditional technique.

M. V. Manjunatha, B. G. Masthana reddy clarified that, Studies were directed at Agricultural Research Station, Gangavathi, Karnataka state during 2002 to 2004 on the achievability of motorizing relocating tasks in paddy crop so as to diminish the expense of development. An eight line self-moved paddy transplanter was utilized for the reason. The presentation of the mechanical transplanter was very agreeable.

Rajvir Yadhav et al (2007) has directed ergonomics assessment of six lines physically worked rice transplanter. Under this examination the field limit of the transplanter was more than that of the customary technique and normal power needed to pull transplanter was viewed as 130.32 N for male and 145.12 N for female laborers. Martin and Chaffin (1972), Ayoub and McDaniel (1974) and Chaffin et al. (1983) found that statures at which push-pulls applied are the main angles that colossally influences the power yields.

During the time of 2008 A.K. Goel et al. directed an analysis on three transplanter specifically OUAT, CRRRI and Yanji rice transplanter. Here they inferred that as indicated by the examination 32 hours of sedimentation period was reasonable for manual transplanter while the equivalent was 56 hours for the Yanji transplanter.

3. PROBLEM STATEMENT

In many villages the rice planting is done manually so labour cost is increases due to persons which are to used for the planting purpose. Here is the solution of this, if we made small rice transplanter having low cost and also low cost for the maintenance. This rice transplanter is operated manually. If we use the transplanter the labour cost is decreases and the work will be completed in time as compared to the previous situation.

4. OBJECTIVES

- i. To decrease the time of planting.
- ii. To decrease the labor cost.
- iii. More area can be planted by using this machine as compared to the old technique.
- iv. The product should be ergonomic and easy to use.

5. CONSTRUCTION AND WORKING

This section mainly involves the main components, construction of the rice transplanter and the actual working of the project. It is been sub-divided into two sectors construction components and the working and layout.

5.1 Construction Components

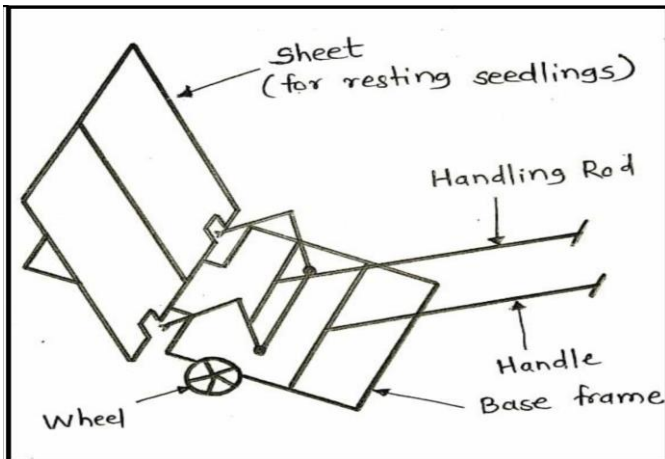
Construction of the rice transplanter involves following components:

- (1) Rectangular Bar: Rectangular bars are used for the firm supporting of the rice transplanter structure.
- (2) Ground wheel: Ground wheel which is in contact with ground. It is mounted on driver shaft it's motion gives quick return mechanism through the chain drive. On the periphery of this wheel blade is mounted to achieve proper grip in mud.
- (3) Bearings: Bearings are used for overcoming the frictional losses.
- (4) Metal Sheets: Metal sheets are used for the purpose of supporting structure and to rest the rice seedling in an effective manner.

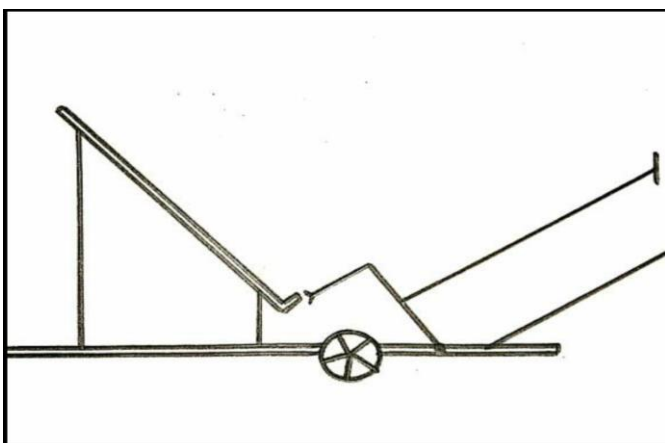
5.2 Working and Layout

Following 15-20 days when the paddy is prepared for relocating which we are doing with the assistance of rice relocating machine. The paddy that fills in other field for 15-20 days are gathered with the assistance of work. Then paddy is put on the rice relocating machine. work pulls the transplanter with a handle gave on the machine, the measure of power applied by the work will bring about movement of wheel. Firstly, we have to place the set of rice plants on to the plate which is connected in front of the transplanter. Then use the rod for the planting. Pull the rod backward and release. When we release the rod, the angled bar connected

to the rod goes forward and the rice plants are stick to the bar. The plants are stick because of the v-structured groove which is cut on the end of the bar. Then this plants are bow in the land at required depth.



Fig(b): Components of the Rice Transplanter



Fig(c): Layout of Rice transplanter

6. CONCLUSION

Mechanical Rice Transplanter is one of the alternative to handle with the issue of the deficiency of the works in the ranch. The machine is driven by labor however motor can also be coupled to improve the presentation. Machine can be created to relocate a few columns at the same time. The dapog should have slight mud layer for simple expulsion of seedlings.

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