

## PADDY PLANTING MACHINE

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### Abstract

India is known to be an farming country. About 71% of the population of India is dependent on farming direct or indirect manner. The farmers are using the same methods and apparatus since ages. As time changes and things required to change as well in order to advance the techniques and equipment's. So, that productivity of farming increases. Agriculture also plays a important role in economy of India. Its contribution in the GDP is now extend one sixth of the total. The Indian Government has also in progress taking steps in the Form many initiatives in which the farmers are made aware about the different farming techniques. There are basically five steps that a farmer needs to do correctly to get increased output. The maximum number of worker required in rice planting is for planting that is seed. Many new instruments are developed and improved in order to save the energy and get more result in this process. A rice planter is being developed countries like China, Japan etc. it is at present taken in use. But here in India the rice planter machine not economical to farmer due to high price. The rice planter in remote nation is run on diesel engine. The current situation of the Indian farmers is not well sufficient to purchase the planters to use it. So, a manual rice planter is being developed in India so reduce the cost of planter. In manual method of rice planting requires, 8-11 labours are required for one acre Planting. Though, if a automated rice planter is used, three people can transplant able to four acres in a day.

### 1. INTRODUCTION

Agriculture is the most important sector of Indian economy. Rice being the major crop cultivated in India, a huge amount of work force is engaged in rice production. The common practice of rice cultivation is manual transplanting of seedlings. Besides being costly, cumbersome and time consuming it is very labours intensive task.

To mechanize the transplanting system several attempts has been made to design and fabricate transplanting machines. Due to high price of an automated paddy transplanter. It becomes impossible for a small scale farmer to purchase a non-subsidized automated paddy transplanter. An attempt has been made to fabricate a manual paddy transplanter which is

effective as well as cheap. Selection of an efficient power transmission system and a suitable mechanism to drive the planting claw is given due considerations in its design. The objective of this project is to design a paddy planting mechanism to plant the rice seedlings by small scale farmers in the country.

paddy planting machine has problems of poor traction, sinkage and steerability. Efficient working of self-propelled rice transplanter requires a suitable puddled soil condition, optimum depth of puddling, degree of puddling and soil strength of puddled field. Planting will reduce the ability to withstand moisture stress. Planting is recommended for 4-4 ½ month varieties and when 3month varieties are planted it should be planted with young seedlings. It is recommended to plant when land preparation is not up to standard and water management is poor. The reason why planting of long age varieties show higher yield compared to broadcasting is that planting reduces the excessive buildup of vegetative biomass due to 4 planting shock.

## **2. RELATED WORK**

A rice planter is a specialized machine fitted with a transplanter mechanism (usually having some form of reciprocating motion) driven by the power from the live axle, in order to the planting rice seedlings onto paddy field. Rice is a

major food grain crop of world. Unlike upland row crops, cultivation of low land rice crop is a labours intensive process. In spite of the common belief of availability of surplus agricultural labours in India, there actually exists a scarcity of skilled agricultural workers during the peak planting seasons. If this operation is not done in time the yield goes down. In view of this, there is an urgent need to mechanize this operation. The rice plantation process is generally manual which involves number of labours. The process of manual rice plantation is not so efficient as compared to the mechanical rice plantation. Machine planting using rice planter requires considerably less time and labours than manual. This method is good for small fields and to fill patches. Manual planting does not require costly machines and is most suited for labor-surplus areas and for small rice fields. Manual planting can be done in fields with less than optimal leveling and with varying water levels. Seedlings are raised in a wet, dry or modified mat nursery. Proper nursery management will produce healthy, vigorous seedlings.

## **3. IMPLEMENTATION**

Mostly our country depends on the Farming. But day-by-day the occupation towards farming is decreasing due to many adverse effects. In farming the labours requirement is very essential in every

aspect where the demand for labours increasing which leads a farmer to face economic crisis. So we are here to decrease the manual work by using machine which reduces the number of labours and even the farmer get benefited to some extent in economic standard.

The project seeks to follow the following steps:

- Design a mechanism for planting paddy seedlings
- Test the performance of the planting mechanism.
- The scope of increment in proficiency is relied upon to be in the vicinity of 30 and 40 percent

Selection of area of research Farmers are not aware of the advantages associated with planting of paddy over the broadcasting. But they are unable to practice it for high scarcity of labour. Still the planting machines available for the country are improved. Engine driven planting are high in cost and the inter-row spacing are fixed which are not suitable for the India condition. Existing manually operated planters are inefficient. The main reason for the poor acceptance was the low capacity of the machine. A simple engine operated planter or manually operated planter having an average capacity of one hectare per day would be a better solution.

There are two methods practices in establishment of paddy in India. Those are Direct sowing / seeding and Planting. Direct sowing / seeding. There are two types 1. Wet seeding 2. Dry seeding. Wet seeding is a Pre germinated seeds are broadcasted into puddled and leveled fields which are free from standing water. At the time of puddling basal fertilizer should be mixed. Irrigation should be done when seedlings are of about 5cm tall. The stand establishment by this method varies with the quality of land preparation, weed competition, water management and rainfall during the initial period after sowing. Dry seeding is a ungerminated dry seeds are sown to dry soil either in rows or in random. Seed rate generally vary with the severity of the environment and the type of physical damages of the seeds. The seed rate varies from 150Kg/ha to 300Kg/ha depending on the level of weed infestation in dry seeded rice. Direct sowing / seeding can be done in two ways by manually or mechanically and also be subdivided in to two categories: Row seeding this method follows a uniform spacing between plants. This will require planting guides to have uniform spacing. If use mechanical seeders ungerminated seeds have to be used. Random seeding In this method seeding is done without a definite distance. It is also known as

broadcasting. This is the highly practiced method in India.

Farmers are not aware of the advantages associated with planting of paddy over the broadcasting. But they are unable to practice it for high scarcity of labor. Still the planting machines available for the country are imported. Engine driven planters are high in cost and the inter-row, intra-row spacing are fixed which are not suitable for the India condition. Existing manually operated planters are inefficient. The main reason for the poor acceptance was the low capacity of the machine. A simple engine operated planter or manually operated planter having an average capacity of one hectare per day would be a better solution. Agriculture is the most important sector of the Indian economy. It is the most important source of employment for the majority of the work force in the country. Approximately 38 percent of the total labor force was engaged in agriculture in 1999. Among that highest percentage was in paddy sector. Rice is the major staple food of the country. Releasing of work force to sectors other than Agriculture is important to develop the country. To release the work force in paddy sector mechanization plays a big role. To feed growing population is a huge challenge. Importation of rice will lead to drain out the economy of the country. Mechanization of paddy sector

will lead to higher productivity with releasing of work force to other sectors. The objective of this project was to design a paddy planting mechanism to plant paddy seedlings by small scale farmers in the country.

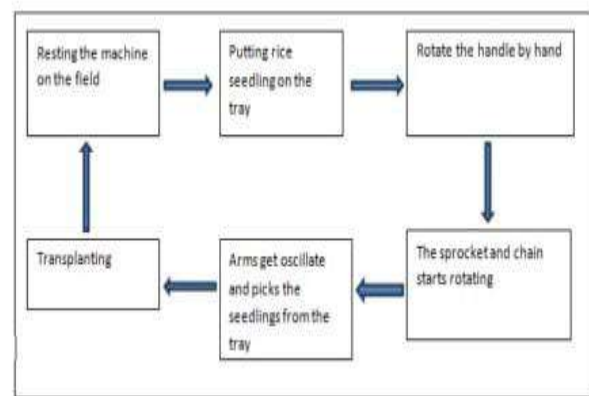
#### **4. EXPERIMENTAL RESULTS**

Majority of farmers in developing countries are poor and avoid taking risk in adopting new technology until they are sure about its benefits. In the time where technology is merging with environmental awareness, consumers are looking for ways to contribute to the relief of their own carbon footprints. Pollution is manmade and can be seen in our daily lives, more specifically in our own homes. The era of modernization is viewed in the entire sectors special in the agriculture sector. Gone are the days when farmers meant a poor man laboring hard to meet his needs. In the modern times, farmers are equipped with agriculture technology that is latest and trouble free. With the entry and increasing influence of science in the traditional farming, the agriculture industry of the nation is celebrating green revolution each moment. The new technologies have helped in utilizing even the small land into loads of profit making source. Farmers whether small or big are getting more and more aware of the fact that technology is very beneficial to them and the future of the agriculture industry.

It works on the basics of movements produced by manually pulling. When we manually pulling the machine it automatically rotates the wheel and correspondingly it touches the lever kinematic linked to planter stick with the help of motion of chain and by the torque produced in the chain which is been transmitted by the sprockets. It continuously plants until we stop our pulling. It contains the rice which carries the plants. Paddy seedlings are kept in the tray and allowed to flow down under gravity. The fork which is attached to shaft picks up the seedlings from the tray and keeps it in horizontal position on the skid. The motion for the shaft is given by hand using chain and sprocket arrangement.

As the process is manual the worker has to provide the initial motion by rotating the hand wheel. When the rice transplanter will move forward the padded wheel will get rotate. The wheel is provided with the spokes so that it can travel easily in the mud. Then we have larger gear is provided on the same shaft with the padded wheel and hence at the same time gear will also rotate. The larger gear is in engagement with the smaller gear by using the chain drive. As the power will get transmitted to the smaller gear, it will rotate. On the same shaft planting finger will be fixed through the linkage so that it will oscillate for certain angle. As the drive is provided by

the worker it will not have high speed and hence through this gear arrangement we have increase the planting finger speed. As the planting finger will oscillate, it will pick the nursery seed from the seedling mat and planted in mud. The planting finger is designed in such a way that nursery seed should be easy to pick during the motion and also it should pick during the downward motion.



Schematic Diagram



### Prototype

## 5. CONCLUSION

This new planting technique is mostly recommended in the Rice paddy planting. The mechanism has been designed. The trial machine proves to be more beneficial as regards to increase the rate of productivity, is easier working operation,

less fatigue to the labor, accuracy of high degree. Ensure uniform spacing and planting depth of planted rice seedlings. Saves time and cost of labor which helps the farmer in economic standards. The paddy seedling planting machine worked satisfactorily. But, there were some improvements to be done before introducing to the farmers. The machine is driven by man power but engine can be coupled to enhance the performances. Machine can be developed to transplant several rows simultaneously. Weight of the machine should be reduced by removing sprocket, chains and adding small gears. The dapog must have thin mud layer for easy removal of seedlings.

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