

Planting Methods in Paddy Cultivation

P Babu, N Raja Kumar, N Sathi Babu, N Kishor Kumar, PVS Ramunaidu, K. Sankar Rao, A Sowjanya, Ch Maha Lakshmi, Y Sravanthi and P Rajesh

KrishiVigyan Kendra, Kondempudi, Anapakalli, ICAR, ANGRAU, AP-531026

ARTICLE ID: 59

Introduction

Rice is one of the main food crops in the world, especially in Asia and Africa. India is the second largest country in the production of rice in world. The demand for rice is growing with ever-increasing population. Cost of cultivation in paddy is raising year by year due to many reasons i.e., social reasons, situational factors and input cost. At present cost of cultivation per hectare ranges between Rs.54250/- to Rs 58500/-. The major operations like nursery preparation and its management, pulling out seedlings, transporting and distribution of seedlings to main field and transplanting consumes 25-30 per cent of total cost of cultivation in transplanted rice. These major operations can be replaced by direct seeding (wet method and dry method) that can reduce labour needs by more than 20% in terms of nursery management factors and transplanting. So, direct seeding (Suthkar et al., 2020) is much helpful due to less labour and time requirement by skipping the operation of nursery raising and transplanting to the field manually. For this, seed drill implements and drum seeder is a great helper to the rice farming community. The performance of a seeders/drill is mainly dependent on type of soil and field conditions, preparation of seed bed, speed of operation and power source. Hence new innovations and initiatives are required to make rice production system more sustainable and economically profitable. Under these circumstances, direct sown paddy with seed cum fertidrill, drumseeder and rice transplanter appears to be a viable alternative for rice cultivation that saves expensive inputs, water and labour.

Different types of paddy sowing methods:

Two methods are used for raising rice crop in India, namely upland cultivation (direct seeding) and wetland cultivation (direct seeding and seedling transplanting).

- ✚ Seed cum ferti drill – Direct dry sowing
- ✚ Drum seeder – Wet sowing³. Rice transplanter – Nursery management required⁴.
Transplanting - Nursery management required⁵. Broadcasting.

Seed cum Fertilizer drill

Direct seeding of Rice with Ferti Cum Seed Drill (K. Tejeswara Rao *et al.*, 2020) can reduce the labour requirement during transplanting, technology is very simple and can be adopted by the farmers easily, cost of cultivation can be reduced and receive quality crop harvest at 7- 10 days earlier than normal transplanted field. This technology holds special significance in the production system with regard to saving labour component by 30-50% and increases productivity by 20-30%. This a new way of cultivation of paddy to promote the mechanization which reduces the cost of cultivation. This methodology has its own implications to adopt such as right choice of field, irrigation facilities, varieties, land preparation, weed management and machinery available.

- **Specifications:** There is no need for transplantation. It is a tractor drawn implement. It covers 9 rows of 20-22.5cm row-to row spacing at a time. Plant to plant is continuous. It is made up of iron and plastic materials. Vertical/Trough feed and fluted roll mechanism was used as seed metering.
- **Salient Features:** Reduced labour cost, cost on nursery raising, nursery pulling and transplanting can be saved, Uniformity in seed sowing and Plant population, reduction in seed rate and thinning cost. Crop matures 7-10 days earlier than the transplanted paddy, Light in weight and easy to handle, an area of 3-4 hectare per day can be shown and saving in seed requirements of 15-17 kg per acre is sufficient depending on variety.

Drum Seeder: (Sudharani *et al.*, 2019)

Direct seeding (Wet) in rice is identified as viable technology to overcome the problem of high cost of production and to mitigate flood and drought situation in nursery season. Drum seeder was initially developed by Indian Rice Research Institute, Philippines and it was later modified by the DRR, Hyderabad. Later TNAU, Coimbatore was modified and presently using in all Andhra Pradesh.

- **Specifications:** TNAU drum seeder consists of four seed drums made of fibre mounted over a shaft, provided with ground wheels, floats and handle. The seed drum is cylindrical shape (truncated cone) with 200 mm diameter having 12mm flat spikes of 25mm length kept parallel to the axis of rotation. The slope of the cone facilitates

the free flow of seeds towards the metering holes. Nine numbers of seed metering hole of 10mm diameter were provided along the circumference of the drum at both the ends at a row to row spacing of 20cm. The floats were provided on either side to restrict the shrinkage and to facilitate easy pulling of the drum seeder. The cost of the unit is Rs 4200/-. TNAU drum seeder reduced the drudgery and enhanced the unit area coverage (1.0 ha/2 persons).

- **Advantages:** uniformity in seed sowing, reduction in seed rate and cost of thinning is reduced, hill dropping of the seed is achieved and continuous drilling is eliminated.

Drum seeder was evaluated against the conventional transplanted paddy. Drum seeder is light in weight, easy to operate and more area can be covered by a single man. The seeds are dropped in rows @ 20 cm row to row spacing and the seed rate is about 37.5 kg per hectare of variety of rice was taken in the experimentation. Farmers can take up paddy cultivation at any time, right away, as there is no requirement or delay of raising a nursery.

Rice Transplanter

Many attempts have been made to develop manual as well as self-propelled rice transplanter for transplanting of rice seedlings in rice growing countries such as Japan, China, Korea and India. The manual rice transplanter consists of frame, movable tray and seed picking fingers. Mat type seedlings are placed in the inclined trays. Fingers pick up the seedlings when they are pushed downward and place them in the prepared soil. Plant-to-plant spacing can be controlled by the operator. Transplanters are available in 5-6 rows with comb type fingers. Its working capacity varied from 0.3-0.4 ha/day and requires two persons, one for operating the transplanter and other for filling the tray with mat seedlings. The self propelled rice transplanter consists of air-cooled gasoline engine, main clutch, running clutch, planting clutch, seeding table, float, star wheel, accelerator lever, ground wheel, and handle and linkage mechanism. Seedlings are grown in special seedling trays in controlled environment called mat seedlings. When seedlings are 25-30 day-old, they are uprooted and placed in slanting seedling trays. Power from the engine is transferred to main clutch from where it is transferred to planting and a running clutch. The fingers on four bar linkage mechanism catch 3-4 seedlings at a time separate them from the mat and place it in the puddle soil. A float supports the machine on the water while working in the field. There are two end wheels that facilitate the movement of the transplanter. A marker is provided to

demarcate the transplanting width during operation. The machine maintains row to row and plant to plant spacing. The planting capacity of the machine is about 0.05-0.1 ha/hr. These transplanters are now commercially available in India.



Seed Cum Fertilizer Drill



Drum Seeder Technology



Paddy Transplanter

Conclusion:

The difficulties in nursery raising, drudgery in transplanting, uncertainty in rainfall and lack of water in tanks and wells during nursery raising and labour shortage in nursery raising and transplanting time necessitated for alternate method of rice cultivation. In

transplanted rice which is a labour intensive and expensive can be replaced by direct seeding that can reduce the labour needs by 20%.

References

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