



Short Note

Comparative Study on Improved TNAU Drum Seeder with SRI and Conventional Methods of Transplanting

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An experiment was conducted at Varappur village, Pudukkottai district in Tamil Nadu to compare the performance of Improved TNAU drum seeder with SRI method of transplanting and conventional transplanting in rice cultivation. The row spacing adopted was 20 cm, 25 cm and 20 cm respectively for drum seeder, SRI method planting and conventional planting. The crop sown with drum seeder was matured 10 days earlier than the other methods. The number of tillers m⁻² recorded was 452 in SRI planting, 405 in drum seeder sowing and 358 in conventional method. Regarding the water use efficiency water saving was up to 35 per cent in drum seeder than other methods because of early maturity of crop. The seed rate used was 8 kg ha⁻¹, 20 kg ha⁻¹ and 40 kg ha⁻¹, respectively for SRI method of planting, drum seeder sowing and conventional method of planting. In the case of labour usage there was 90 per cent saving in the drum seeder method when compared to the other two methods. 75 per cent time saving observed in drum seeder sowing in comparison to the other two methods. The SRI method of planting recorded the highest grain yield (7.05 t ha⁻¹) followed by (6.5 t ha⁻¹) and conventional method (5.3 t ha⁻¹).

Key word: Rice, drum seeder, SRI, conventional transplanting.

Rice is the most important and extensively grown food crop in India and it is the staple food for more than half of the world's population. In global scenario, India is number one in area and second in production next to China. If we consider the productivity, India is far below than other rice growing countries. Tamil Nadu is one of the traditional states for rice cultivation and consumption. Now the rice area has got reduced due to urbanization and for the cultivation of commercial crops.

The system of Rice Intensification (SRI) is now spreading widely around the world being further developed and modified as more experience is gained and new conditions are encountered. It is proving to be a very dynamic approach to rice cultivation. SRI is becoming popular and establishing a position within the mainstream of agriculture development. In the same time the use of improved drum seeder was also recommended for direct sowing of rice seeds to eliminate the labour shortage problem in rice growing areas. Increasing rice production with available land area, SRI method and use of improved drum seeder are the best alternatives among the all other methods.

Jonathan E. Lacayanga *et al.* (2009) has developed the manual hill seeder in Bataan Peninsula State University, Philippines for direct seeding purposes. Tests showed that the seeder performance under wetland condition was better

compared to the prototype seeder that includes effective field capacity (0.619 ha day⁻¹), field efficiency (18.20%), seeding rate (20.45 kg ha⁻¹), seeding efficiency (-6.71%), and missed hills (-3.29%). The negative value on seeding efficiency indicates that seeds rate per hill was increased but still within the acceptable seed requirement of 40-50 kgha⁻¹.

Sivakumar *et al.* (2005) has conducted a study at Tamil Nadu Agricultural University, Coimbatore. The hyperboloid drum shape was optimized with 200 mm drum diameter, 9 number of seed metering holes having 10 mm diameter of seed metering hole and 1.0 km h⁻¹ forward speed of operation. The seeder developed using the hyperboloid drum performed better when compared to the existing seeder.

Norman Uphoff (2007) conducted an experiment to compare the performance of existing direct paddy seeder with SRI method of transplanting at KVK, Chittoor, Andhra Pradesh. He found that a higher yield was recorded by SRI method of transplanting (8.7 t ha⁻¹) followed by direct sowing (8.3 t ha⁻¹).

Materials and Methods

The experiment was conducted to study the comparative yield attribute among the three methods of rice cultivation viz., SRI method of planting, drum seeder sowing and conventional planting at farmers

field in Varappur village of Pudukkottai district, Tamil
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Nadu. This experiment was conducted during

samba season and ADT variety was used. An area of 30 cents was selected uniformly for Drum seeder sowing, SRI method of planting and conventional method of planting. The sowing was taken up on the same day for all the methods. For SRI method mat nursery was developed and used with the seed rate of 8 kg ha⁻¹. In SRI method of planting the 14 days aged seedlings were transplanted with a spacing of 25 x 25 cm by using the SRI marker. For drum seeder sowing, the TNAU improved drum seeder was used with the seed rate of 20 kg ha⁻¹. The spacing adopted in drum seeder sowing was 20 x 10 cm. In conventional method of transplanting, transplanting was taken up with 26 day old seedling with a spacing of 20 x 10 cm. The recommended fertilizer schedule was followed for each method. Regarding N management, LCC based nitrogen management was done in all the methods. The inter cultural operations like weeding, top dressing were done at appropriate time. In both SRI and drum seeder methods conoweeder was used from 15 days onwards within 10 days of interval.

In water management, alternate wetting and drying was followed in both SRI and drum seeder methods and maintained 2 cm height of standing water. In conventional method, irrigation up to 5 cm was followed. The samples were taken in one square metre at five places randomly. The data on number of tillers per square meter, productive tillers per square metre total number of grains per panicle, percentage of filled and chaffed grains and grain yield were taken for analysis.

Results and Discussion

The results on the analysis of each method were given in Table 1. In SRI method of planting, the number of tillers per square meter recorded on an average of 452 followed by drum seeder (405) and conventional method of planting (358). With regard

Table 1. Yield attributes by adopting different rice cultivation methods

Methods	No. of tillers sq. m ⁻¹	No. of productive tillers sq.m ⁻¹	Total no. of grains panicle ⁻¹	% of filled grains	% of chaffy grains	Grain yield, tha ⁻¹
SRI	452	415	256	89.6	10.4	7.05
Drum seeder	405	395	248	88.4	11.6	6.5
Conventional	358	321	173	80.4	19.6	5.3

to productive tillers per square meter, SRI method of planting showed more tillers (415) followed by drum seeder (395). In conventional method, more difference was observed (321) between SRI and drum seeder. Use of cono-weeder might be the reason for increased number of productive tillers.

The total number of grains per panicle in SRI planting was 256 and the chaffy grains were only 10.04 per cent followed by drum seeder method (248, 11.6%). In conventional method, the

percentage of chaffy grain was 19.6 per cent. The harvest was 10 days ahead in drum seeder method than other methods. Regarding the water use efficiency, water saving is up to 35 per cent in drum seeder than other methods because of early maturity of crop. The seed rate used was 8 kg ha⁻¹, 20 kg ha⁻¹ and 40 kg ha⁻¹ respectively for SRI method of planting, drum seeder sowing and conventional method of planting. In the case of labour usage, there was 90 per cent saving in the drum seeder method when compared to the other two methods. 75 per cent time saving observed in drum seeder sowing in comparison to the other two methods. The yield data revealed that on an average of 7.05 t ha⁻¹ was recorded in SRI planting followed by drum seeder (6.5 t ha⁻¹) and conventional method (5.3 t ha⁻¹).

Direct seeding method avoids raising nursery, pulling it and transplanting due to which labor requirement is negligible. Farmers can take up Paddy cultivation any time instantly as there is no requirement of raising nursery. Labor requirement for running cono-weeder is reduced to 50 per cent compared to SRI methodology since it runs in one direction only. The major hurdle in adoption of SRI technology i.e., drudgery in cono-weeder running is overcome in direct seeding method. Farmers were of the opinion that they will be happy even if they recover normal yield with the drum seeding technology because they will save about Rs.1200 - 1500 per acre.

Conclusion

The crop sown with drum seeder was matured 10 days earlier than the other methods. The number of tillers m⁻² recorded 452 in SRI planting, 405 in drum seeder sowing and 358 in conventional method. The seed rate used was less in SRI method (8 kg ha⁻¹) and drum seeder sowing (20 kg ha⁻¹) compared to conventional method of planting (40 kg ha⁻¹). Drum seeder method recorded 90 per cent saving in labour usage and 75 per cent time saving when compared to the other two methods. The SRI method of planting recorded the highest grain yield (7.05 t ha⁻¹) followed by drum seeder (6.5 t ha⁻¹) and conventional method (5.3 t ha⁻¹).

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