

# Direct Sown Paddy with Seed Drill – A Low Cost Technology Enhancing Paddy Production in Krishna District of Andhra Pradesh

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**Abstract:** KVK, Ghantasala has conducted sixty front line demonstrations on direct sown paddy with seed drill in farmer's fields of different villages in Krishna district of Andhra Pradesh. Over the last three seasons starting from 2012-13 to 2014-15 this DSP method showed an increase in yield in comparison to TPP. In case of DSP, the growth parameters plant height (88.2cm), effective tillers/hill (16.6 nos.), panicle length (22.9 cm) and No. of grains/panicle (125 nos.) were significantly higher as compared to TPP method. Comparative economics of DSP and TPP method of paddy cultivation revealed that there is a difference in cost of cultivation which is nearly Rs.9000 to 10,000/ ha. The benefit cost ratio of 3.00 was also much higher than the TPP (2.20). The lower net returns of Rs.57, 600 and low benefit cost ratio of 2.20 indicated non-profitability of paddy cultivation under TPP method in Krishna district. Hence it could be recommended that wherever labour is scarce, costlier and for easy intercultural operations, direct seeding through seed drill may be advantageous for increasing the productivity and profitability of direct seeded rice.

**Keywords:** Direct Sown Paddy (DSP), Traditional Practice of Paddy (TPP), Seed drill, Production and productivity

## 1.Introduction

Andhra Pradesh is major rice growing state in India. The total rice area is 2.14 lakh ha and rice is grown in all 13 districts of the state. In Krishna district, rice is the staple food crop and cultivated in an area of 2, 13,452 ha, in spite of different difficulties viz., shortage of water and labour for various operations, high cost of cultivation and less profitability. Industrialization led to increased labour migration to city areas and a shift towards alternative rural employment caused severe farm labour shortage and increased labour cost during peak operations like transplanting, weeding and harvesting in rice cultivation.

Evidence from long-term experiments shows that crop yields of paddy are stagnating and sometimes declining (Duxbury et al. 2000; Ladha et al. 2003). The yield through transplanting method has been limited by number of factors such as labour intensive and cumbersome and it is a real drudgery to women folk. 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. This can be replaced by direct seeding that can reduce labour needs by more than 20% in terms of working hours required (Santhi et al., 1998). The raising of nursery and manual transplanting are both labour intensive and costly propositions (Das, 2003). So, direct seeding is much helpful due to less labour and time requirement by skipping the operation of nursery raising and transplanting to the field manually. Expansion of irrigated area, availability of short duration high yielding rice varieties, effective weed control methods, increased transplanting costs and declining profitability of rice production forced many farmers to shift from transplanting to direct sown paddy in this zone. For this, seed drill implement is a great helper to the rice farming community. In Krishna, the area under direct sown is 17,080

ha and rice sown with seed drill with an area of 10,751 ha. The performance of a seeder is mainly dependent on type of soil and field conditions, preparation of seed bed, speed of operation and power source (Kepner et al., 2000). 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 drill appears to be a viable alternative for rice cultivation that saves expensive inputs, water and labour. Keeping view upon this, Krishi Vigyan Kendra, Ghantasala, Krishna district, Andhra Pradesh has taken up demonstrations to introduce and popularize Paddy sowing with seed drill over traditional random planting method of rice cultivation. The specific objectives of the study were

- To assess the comparative yield performance of rice through direct sown with seed drill over traditional method in Krishna district of Andhra Pradesh
- To analyse the performance of the direct sown paddy over farmers traditional method of rice cultivation in terms of profitability in Krishna district of Andhra Pradesh

## 2.Methodology

As an initiative for promotion of direct sown Paddy over Traditional practice in farmers' field, the Krishi Vigyan Kendra, Ghantasala, Krishna district conducted more than 60 demonstrations on direct sown paddy in comparison with traditional method continuously for three years during Kharif 2012-13, 2013-14 and 2014-15 at farmers' field in different villages of Krishna district. Beneficiary selection for FLDs on DSP was made through discussion and personal contact with farmers on the basis of certain socio-personal characteristics like socio-economic status, innovativeness, progressiveness and risk orientation.

### 3. Results

The observations in respect of yield attributes of rice were found to be highest in DSP as compared to TPP method of rice cultivation. The three years pooled data in both the cases revealed that in case of DSP method the yield attributes like plant height (88.2cm), effective tillers/hill (16.6 nos.), panicle length (22.9 cm) and No. of grains/panicle (125 nos.) were significantly higher as compared to TPP method (Table

1.) Maximum grain yield of rice was recorded in Direct Sown Rice with 51.50q/ha, 53.57q/ha and 52.76 starting from 2012-13, 2013-14 and 2014-15 over the yield rate of 52.35q/ha, 51.00q/ha and 48.65q/ha in case of TPP method respectively. The increased in productivity might be due to higher yield attribute in DSP over TPP method of rice cultivation and better yield attributes justifies the lead of DSP over TPP method of rice cultivation.

**Table 1:** Comparative performance of paddy under DSP and TPP methods of cultivation at farmers' field of Krishna district, Andhra Pradesh

Parameters	Direct Sown Paddy (DSP)				Traditional Practice of Paddy (TPP)			
	2012-13	2013-14	2014-15	pooled	2012-13	2013-14	2014-15	pooled
Plant height (cm)	89	87.6	88	88.2	76	78	80	78
Effective tillers/hill	17	17	16	16.6	12	14	13	13
Panicle length (cm)	23	23.3	22.5	22.9	19	18	20	19
Grains per panicle	125	114	136	125	105	110	121	112
Yield (q/ha)	51.50	53.57	52.76	52.61	52.35	51.00	48.65	50.66
Crop duration (days)	145	143	143	143	153	155	155	154



**Paddy sown with seed drill**

Results further revealed that due to adoption of DSP technology the crop duration for the same variety was reduced by at least 10-15 days as compared to TPP method of rice cultivation which might help the farmers to go for second crop in advance in comparison to TPP (Table 1). The reduced duration and yield enhancement of crop in case of DSP might also help the farmers to expand their area of rice cultivation during the three years of DSP technology interventions by KVK.

**Economic performance of DSP over TPP:** The demonstrations conducted in Krishna district of Andhra Pradesh showed that the estimated input cost of paddy under direct sown was lower than TPP method of paddy cultivation as per the figures in Table 2. It presents the comparative economics of Direct sown over traditional method of paddy cultivation.

**Table 2:** Economic evaluation of paddy cultivation under DSP over TPP method at farmers' field of Krishna district, Andhra Pradesh

Particulars	DSP	TPP
Land Preparation (Rs.)	2200	2200
Nursery (Rs.)	830	2680
Transplanting (Rs.)	--	4050
Organic manures (Rs.)	1000	1000
Chemical manures (Rs.)	3190	3190
Weeding (Rs.)	1000	1000
Plant protection chemicals (Rs.)	700	1150
Harvesting (Rs.)	7600	7600
Grain Yield (kg/ha)	5120	4806
Cost of cultivation (Rs/ha)	33,000	42,800
Gross returns (Rs.)	99,120	94,800
Net returns (Rs.)	61,200	57,600
Benefit cost ratio (B:C)	3.00	2.20

Table 2 shows the advantages of direct seeding with seed drill over traditional transplanting in terms of yield and net income besides reducing the duration of the variety. There is a difference in cost of cultivation which is nearly Rs.9000 to 10,000/ ha. The benefit cost ratio of 3.00 was also much higher than the TPP (2.20). The lower net returns of Rs.57,600 and low benefit cost ratio of 2.20 indicated non-profitability of paddy cultivation under TPP method in Krishna district. Hence it could be recommended that wherever labour is scarce, costlier and for easy intercultural operations, direct seeding through seed drill may be advantageous for increasing the productivity and profitability of direct seeded rice.

### 4. Conclusion

The study concludes that DSP is a highly remunerative crop production method in paddy as compared to TPP method in Krishna district. This method projected higher yield with low cost of cultivation over traditional method. Hence, the higher positive relationship between the grain yield and crop growth parameters resulted in increase in grain yield which leads to higher preference of farmers for adoption of direct

sown paddy method of paddy cultivation over traditional method. Some of the factors are constraining the full adoption of the direct sown paddy are lack of land leveling, skill in operating seed drill, weed control and poor water control in the fields. If farmers overcome these constraints, this technique will make remarkable performance than the traditional method. This method gained a momentum in up-scaling the paddy productivity which created a positive impact on farming community.

## References

- [1] Kepner, R.A., R. Bainer, and E. L. Barger. 2000. Principles of farm Machinery. CBS Publishers and Distributors, New Delhi, (India)
- [2] Santhi, P., K. Ponnuswamy, and N. K. Chetty. 1998. Effect of seeding methods and efficient nitrogen management practices on the growth of lowland rice. *Journal of Ecobiology*, 10 (2):123-132.
- [3] Das, F. C. 2003. CRRRI drum seeder for sowing pre-germinated paddy seeds in puddle field. In: International seminar on downsizing technology for rural development (ISDTRD- 2003). 139-142. Regional Research Laboratory, Bhubaneswar, India.
- [4] Duxbury, J.M., I.P. Abrol, R.K. Gupta, and K.F. Bronson. 2000. Analysis of long-term fertility experiments with rice-wheat rotations in South Asia. In I.P. Abrol, K.F. Bronson, J.M. Duxbury, and R.K. Gupta (eds.), Long-term soil fertility experiments in rice-wheat cropping systems. Rice-Wheat Consortium Paper Series 6. New Delhi, India: RWC. Pp. vii-xxii.
- [5] Ladha, J.K., D. Dawe, H. Pathak, A.T. Padre, R.L. Yadav, B. Singh, Y. Singh, Y. Singh, P. Singh, A.L. Kundu, R. Sakal, N. Ram, A.P. Regmi, S.K. Gami, A.L. Bhandari, R. Amin, C.R. Yadav, E.M. Bhattarai, S. Das, H.P. Aggarwal, R.K. Gupta, and P.R. Hobbs. 2003. How extensive are yield declines in long term rice-wheat experiments in Asia? *Field Crops Research* 81:159 - 180.