



## **Promotion of Direct Sowing Paddy using 8-row Drum Seeder in Vizianagaram District**

**M Visalakshi and A Sireesha**

Regional Agricultural Research Station, Anakapalle, Andhra Pradesh

### **ABSTRACT**

The DAATTCentre, Vizianagaram has introduced an 8-row drum seeder in farmers field of Sri GAV Rama Raju, Thettangi village, Gurla mandal, Vizianagaram district during Kharif, 2007 to evaluate the efficiency of drum seeder and was compared with conventional methods of transplanted and broadcasted rice. After the success of the trial, the DAATTCentre promoted direct sowing of paddy using drum seeder during kharif and rabi seasons of 2007, 2008 and 2009 through 34 on-farm trials, 36 front line demonstrations, 18 exposure visits for farmers, 6 field days, 18 farmers training programmes and one rythusadassu in collaboration with department of agriculture and NGO (world vision) in all the mandals of Vizianagaram district. Seeding of sprouted seed @ 30 kg/ha with drum seeder was at par with transplanting and broadcasting methods and recorded increased grain yield by 44.4% and 31.2% over the farmers practice of transplanting and broadcasting. Direct sowing paddy using 8-row drum seeder reduce the seed rate by 46-73% as compared to transplanting/ broadcasting. The cost of rice cultivation using drum seeder is reduced by 23% as compared to conventional transplanted rice and 28% as compared with broadcasted rice. Adoption of direct sowing paddy in puddled field using 8-row drum seeder gives 40 to 55% more net profit than transplanted rice. During 2007-08 to 2009-2010, an estimated 7,500 farmers in Vizianagaram district adopted direct sowing paddy using drum seeder on around 2800 hectares.

**Key words :** Direct seeding paddy, Front line demonstrations and field days, 8-row drum seeder, Net returns, Yield.

Transplanting is the most common method of rice cultivation in low land rice. In Vizianagaram district, Andhra Pradesh, the major area of rice cultivation is under tankfed irrigation solely depends on rainfall and in many years overaged seedlings are used for planting due to delayed monsoon. The raising of nursery and manual transplanting are labour intensive and costly operations. Transplanting is not profitable due to high labour wages and the problem of non-availability of labour during peak period of operation (Singh *et al.*, 2005). Transplanting alone costs equal about 15% of total rice production cost and delayed transplanting due to labour shortage causes sustainable loss in yield (Ponnuswamy *et al.*, 1999). Transplanting also enhances the crop duration by 7-10 days. On the other hand broadcasting causes uneven plant population in puddled condition and seed requirement is also high. Therefore, there is need of alternative methods to replace transplanting to tackle the problems of high cost of production and

labour scarcity. The alternative methods such as dry seeding in aerobic soil conditions or wet seeding in aerobic or anaerobic soil condition can be chosen depending on the circumstances of the location.

In irrigated areas, dry or wet seeding can be done. It saves irrigation water as seedbed preparation is done in dry or moist condition. In dry seeding fields, weeding cost is high. By adopting line seeding in puddled fields weeding cost is drastically reduced due to use of chemical weedicides or mechanical weeders. In case of wet seeding method, pregerminated seeds are broadcasted in puddle soil and is generally practiced in irrigated and favourable low land conditions. Wet seeding fields need proper levelling and drainage for better crop stand whereas in water logged condition seed germination percent is reduced. Technology transfer is a key step for successful agriculture. On-farm testing has been identified as a tool to refine or modify the technology for adoption by the farmers.

Keeping in view, the present study was conducted in farmers fields to find out the sustainability of the technology to reduce the labour cost, water and time for direct sowing paddy in puddled conditions using drum seeder in comparison with traditional methods of paddy cultivation.

### MATERIAL AND METHODS

The District Agriculture Advisory and Transfer of Technology Centre (DAATTCentre), Vizianagaram has conducted on farm trials during *kharif* seasons of 2007-2008 and 2008-2009. Five villages were selected to carry out on-farm trials based on purposive random sampling. Two hectares was allotted as a representative area for testing the performance of drum seeder in farmers fields with 5 treatments *Viz.*, T<sub>1</sub> - Farmer's practice of transplanting; T<sub>2</sub> - Farmer's practice of broadcasting 75 kg/ha; T<sub>3</sub> - Seeding sprouted seed @ 20 kg seed/ha using drum seeder; T<sub>4</sub> - Seeding sprouted seed @ 30 kg seed/ha using drum seeder; T<sub>5</sub> - Seeding sprouted seed @ 40 kg seed/ha using drum seeder. Seeding of nursery was also done on the same day and 30 day old seedlings were transplanted in T<sub>1</sub> and 75 kg/ha seed was broadcasted in T<sub>2</sub>. In treatments T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> sprouted seeds were sown at three seed rates using drum seeder. For direct sowing using drum seeder, the paddy seeds were soaked in water for 24 hours followed by incubation in gunny bags for 24-48 hours depending upon the rice variety and weather temperature. The field was well puddled and levelled after draining the standing water. After puddling, the field is left for 1-2 days for settling of the puddled soil. The pregerminated paddy seeds were sown in 8 lines using drum seeder.

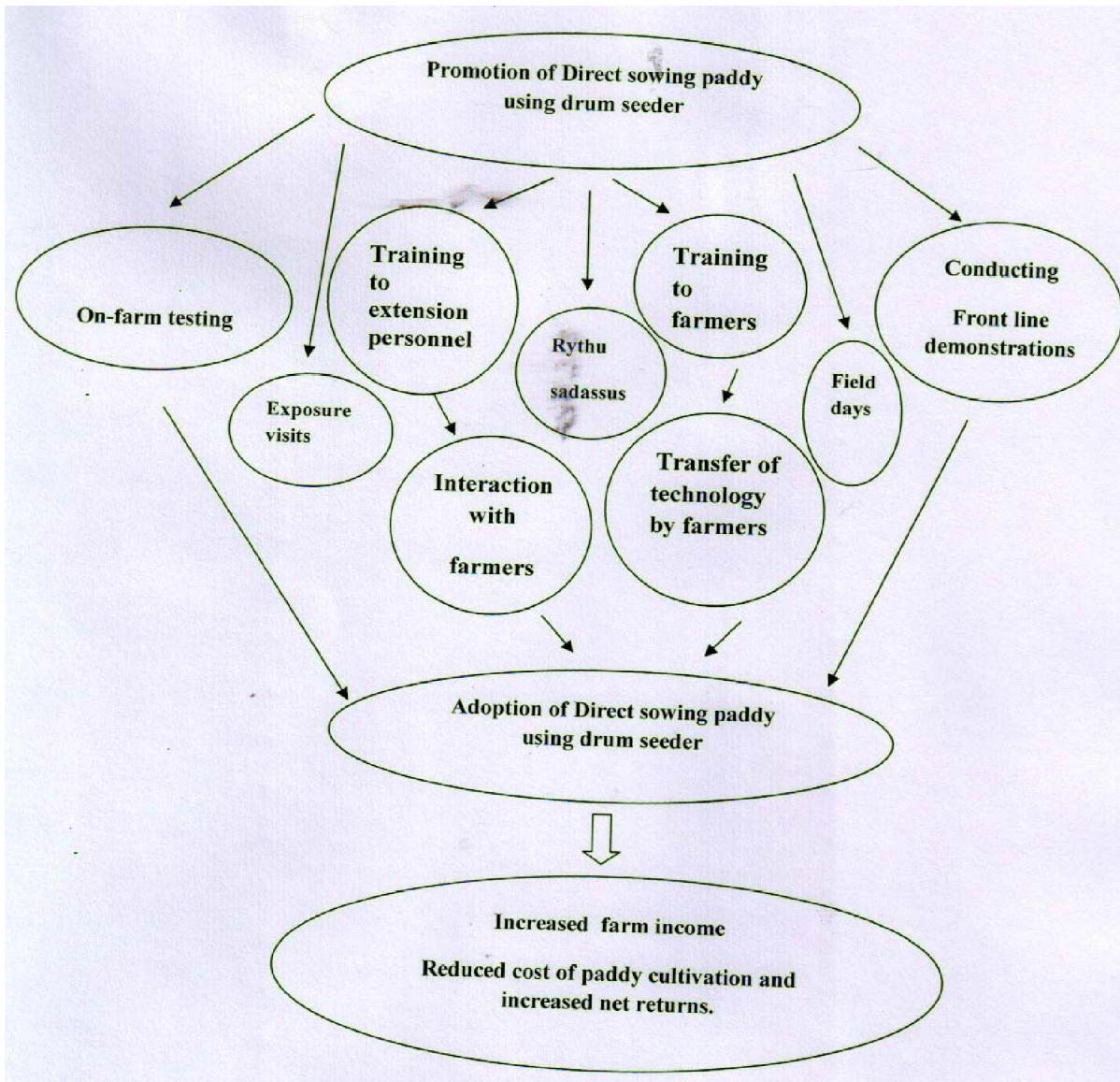
Yield attributes of rice influenced by sowing methods under puddled condition were recorded. Cost of cultivation and net returns of each treatment were calculated on the prevailing cost of inputs and market prices. Awareness on use of drum seeder was created by campaigns and field visits. This had evoked interest among the farmers in adopting direct sowing paddy using drum seeder. Trainings, front-line demonstrations, on-farm testing, field days, exposure visits and rythusadassus have been used systematically during 2007-08 to 2009-10 to convince and disseminate the direct sowing paddy using drum seeder to the farming community of vizianagaram district (Fig.1).

### RESULTS AND DISCUSSION

The DAATT Centre, Vizianagaram introduced 8 row paddy drum seeder made of fibre supplied by KSNM marketing, Coimbatore through AGROS during *kharif* season, 2007. After the success of on-farm testing in the field of Sri. GAV Ramaraju, Thettangi village, Gurla mandal, Vizianagaram district, the DAATTCentre introduced six more drum seeders with financial support from NGO (World vision) in the district during *kharif*, 2008. During *Kharif*, 2009, DAATTCentre motivated Assistant Director of Agriculture's (ADA's) at subdivision level to purchase 6 drum seeders and two more drum seeders by individual farmers. In total, there were 15 drum seeders utilized by the farmers facilitated the promotion of the technology in vizianagaram district during the period from 2007-08 to 2009-10. Front line demonstrations and on-farm trials were conducted to demonstrate the performance of drum seeder for direct sowing paddy under puddled condition in an area of 90 hectare involving 105 farmers during 2007-08 to 2009-10. Performance of drum seeder for direct sowing paddy in puddled fields showed highest tillers/m<sup>2</sup>, panicles/m<sup>2</sup> and filled grains/panicle in T<sub>4</sub> (seeding sprouted seed @ 30 kg seed/ha using drum seeder) and was on par with transplanting and broadcasting methods (Table1). Shekar and Singh (1991) stated that direct sowing of sprouted seeds under puddle condition results in significant improvement in yield attributes and grain yield. The highest grain yield was observed with treatment T<sub>4</sub> (seeding sprouted seed @ 30 kg seed/ha using drum seeder) followed by T<sub>5</sub> (seeding sprouted seed @ 40 kg seed/ha using drum seeder). T<sub>4</sub> recorded 26.2% and 31% highest grain yield over T<sub>2</sub> (Farmer's practice of broadcasting sprouted seed @75 kg/ha) and T<sub>1</sub> (Farmer's practice of transplanting with seed rate @ 75kg/ha). Halder and Patra (2007) stated that seeding of sprouted seeds with 8-row seeder after puddling increased grain yield by 21.5% over farmer's practice of transplanting.

Highest net return was recorded with T<sub>4</sub> is due to higher grain yield, straw yield and low cost of cultivation during the three year study. Farmer's practice of transplanting recorded the lowest net returns due to low grain yield. Highest benefit : cost ratio was recorded with seeding of

Fig. 1. Promotion of Direct sowing paddy using drum sender in Vizianagaram district by DAATT Centre.



sprouted seed @30 kg/ha using drum seeder (Table 2). Similar findings were reported by Halder and Patra (2007).

With the adoption of technique direct sowing paddy with spouted seed @30 kg/ha using drum seeder, the paddy farmers could earn a net income of Rs.36,697/- per hectare which was Rs.10,436/- more than their income before adopting direct sowing. Use of drum seeder reduced the expenditure on seed by 60% and on labour by 90% as compared to conventional transplanting. The farmers who conducted this trial and the rest of the farmers who closely observed it and are very much convinced about this technology, especially

in terms of the tiller development, yield potential and benefit–cost ratio. These trials clearly established the advantage of direct sowing paddy using drum seeder in puddled condition over conventional method of transplanting. During the three years period, a total of 18 training programmes were conducted with 540 farmers emphasizing on advantages of reducing cost of labour and input and greater ease of rice cultivation apart from yield advantage of direct sowing paddy using drum seeder over traditional system.

To bridge the gap between the researchers and the farmer's field visits and farm advisory services were conducted. Two hundred thirty four

Table 1. Yield attributes of rice influenced by sowing methods under puddled conditions.

Treatment	No. hills/m <sup>2</sup>			Max. tillers/m <sup>2</sup>			Panicles/m <sup>2</sup>			Filled grains/panicle			1000 grain weight (g)		
	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
T <sub>1</sub> Conventional transplanting with seed rate @75 kg/ha	24.00	26.0	29.0	354.50	362.0	359.75	325.50	336.75	326.50	175.00	163.25	151.00	21.00	20.41	21.30
T <sub>2</sub> Broadcasting of sprouted seed @75 kg/ha	28.75	31.0	30.0	375.75	385.0	389.50	361.25	372.50	375.00	182.25	181.25	181.00	21.08	21.09	21.29
T <sub>3</sub> Seeding of sprouted seed @20 kg/ha using drum seeder	37.00	40.0	38.0	410.00	386.0	397.25	389.50	369.25	385.25	180.00	185.25	185.75	21.79	21.02	22.08
T <sub>4</sub> Seeding of sprouted seed @30 kg/ha using drum seeder	40.00	41.0	44.0	415.50	438.0	424.75	400.00	417.75	404.50	193.25	190.25	192.25	22.18	21.68	22.23
T <sub>5</sub> Seeding of sprouted seed@40 kg/ha using drum seeder	44.75	43.0	45.7	404.75	420.0	385.75	386.75	406.75	372.75	185.50	188.25	184.00	21.15	21.00	21.86
CD (P=0.05)	NS	NS	NS	15.50	16.1	16.26	19.04	13.07	17.61	NS	NS	NS	NS	NS	NS



field visits were made by DATT Centre scientists alone and along with extension personnel to educate farmers on advantages of direct sowing paddy using drum seeder. Fifty one guest lectures were delivered to the extension personnel, farmers and farm women on direct sowing technology. About six hundred fifty farmers were motivated during exposure visits and rythusadassus. Pamphlets containing direct sowing technology was brought out for effective adoption by farmers.

Direct seeding paddy using drum seeder has greatly expanded in vizianagaram district through 34 on-farm trials, 36 front line demonstrations, 18 exposure visits for farmers, 6 field days, 18 farmers training programmes and one rythusadassu in collaboration with department of agriculture and NGO which motivated many farmers in the district. Sensitization programmes covering all the 34 mandals of vizianagaram district; demonstrations and guidance to the farming community on about 2800 ha covering 16 mandals; exposure visits, field days, farmers training programmes were undertaken by DATT Centre to promote direct sowing paddy. Impact of the efforts of DATT Centre in popularising direct sowing have been brought out by using various indicators like increased demand for drum seeder, reduction in cost of cultivation and increased farm income.

### Conclusion

Thus, rice cultivation by seeding of sprouted seed @ 30 kg/ha using drum seeder under puddle condition gave higher rice grain yield than farmer's

practice of transplanting/broadcasting using 75 kg seed/ha. Direct sowing paddy using 8-row drum seeder reduce the seed rate by 46-73% as compared to transplanting/ broadcasting. The cost of rice cultivation using drum seeder is reduced by 23% as compared to conventional transplanted rice and 28% as compared with broadcasted rice. Adoption of direct sowing paddy in puddled field using 8-row drum seeder gives 40 to 55% more net profit than transplanted rice. Highest net returns and benefit cost ratio was recorded with direct sowing of sprouted paddy seed using drum seeder under puddled condition.

### LITERATURE CITED

- Halder J and Patra AK 2007** Performance of 8-row drum seeder in direct seeded rice (*Oryza sativa*) under puddle condition. *Indian Journal of Agricultural Sciences*, 77(12) : 819-23.
- Ponnuswamy K, Santhi P, Kempuchetty N and Subramaniam M. 1999** Effect of various methods of establishment on growth and yield of rice. *Oryza*, 36(3) : 294-5.
- Shekar J and C M Singh 1991** Influence of methods and dates of stand establishment on growth and yield of rice. *Oryza*, 28 : 45-48.
- Singh G, Singh R G, Singh O P, Kumar T, Mehta R K, Kumar V and Singh P P 2005** Effect of weed management practices on direct seeded rice (*Oryza sativa*) under puddle low lands. *Indian Journal of agronomy*, 50(1) : 35-7.

(Received on 04.03.2013 and revised on 01.07.2013)