

Assessment of tractor drawn seed cum fertilizer drill for line sowing of horse gram

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ABSTRACT

The study was carried out to assess the performance of tractor operated seed cum fertilizer drill for line sowing of horse gram. On farm testing was carried out on an area of 5 ha with the active participation of farmers from different blocks of Dantewada districts. FOTs recorded increasing yield 24.24 per cent of line sowing of horse gram as compared to farmers' local practices. Also save costly seeds 44.89 per cent as compared to broadcasting manually. The improved technology assessed better performance over farmers practice to reduce cost of cultivation and increase net profit.

Keywords: Economic return, horse gram, seed cum fertilizer drill, yield

Horse gram, also known as Kulthi, is considered a "poor man's pulse" and is grown in arid areas of India. The crop has good adaptability under adverse climate conditions. It yield well on poor soils, is drought resistant, has a high nitrogen fixation ability and also helps in soil conservation (Yadava and Vyas, 1994). Horse gram, *Macrotyloma uniflorum* (Lam) Verdc is native to India (Bogdan, 1977) and is a short day plant. However some lines exhibit day neutral qualities as well as with plants maturing are in about 120-180 days after planting (Morris, 2008). It is one of the inexpensive sources of protein, calcium, and iron. Different parts of the plants are used for the treatment of heart disease, asthma, bronchitis, urinary discharges and for treatment of kidney stones. In Dantewada (South Bastar) district of Chhattisgarh, horse gram commonly called as kulthi plays a major role in augmenting the income of small and marginal farmers and is cultivated in kharif season. Study was carried out to assess the performance of tractor drawn seed cum fertilizer drill for line sowing of horse gram regarding to achieve high productive potentials as compared to locally cultivated practices under real farm situation.

Nine rows tractor drawn seed cum fertilizer drill was used to sow horse gram in the farmer's field of seven villages from different block of Dantewada district during *kharif* season 2014-15. Experiments was conducted in 5 ha area keeping spacing between rows 30 cm. Details specification of TD seed cum fertilizer drill used for experiment as sown in table1. It was also calibrated in laboratory for proper seed rate. The sowing was done in the last week of August to middle of September at an average seed rate of 27 kg ha⁻¹. Local variety pancham kulthi of horse gram was included in the 8 trails. Two hand weeding within lines was done and after each rain hoeing was done 2 times up to 2.5 cm for conservation of soil moisture and the crop was harvested at perfect maturity stage.

MATERIALS AND METHODS

Table 1: Technical specification of tractor operated (TD) seed cum fertilizer drill

Particulars	Dimensions
Power source	Tractor operated
No of row	9
Row spacing	Adjustable as per crop requirement
Seed mechanism	Fluted roller
Furrow opener	Shovel type
Source of power	Ground wheel
Diameter, mm	360
Lug height , mm	50
No of Lug	12
Transmission	Sprocket and chain
Mechanism type	arrangement

Table 2: Performance of TD seed cum fertilizer drill of line sowing horse gram as compared to farmers practice.

Parameter	Observation	
	Recommended practice	Farmers' practice
Method of sowing	Line sowing using TD Seed cum fertilizer drill	Manually broad casting
Area (ha)	5	5
Number of farmers	8	8
Yield (Kg ha ⁻¹)	561	425
Seed rate (Kg ha ⁻¹)	27	49
Per cent increase in yield	24.24	-
Field efficiency (%)	64.44	-



Fig.1: Sowing of horse gram in field using seed cum fertilizer drill



Fig. 2: Horse gram sown in line using seed cum fertilizer drill



Fig. 3: Photographs of extension activities for popularize the TD seed cum fertilizer drill technology

Table 3: Economics of improved and local technologies used to grow horse gram.

Parameter	Local Practice	Farmers' Practice
Gross return (Rs ha ⁻¹)	14000	10500
Cost of cultivation (Rs ha ⁻¹)	5920	7080
Net return (Rs ha ⁻¹)	8080	3420
B:C Ratio	2.36	1.48

RESULTS AND DISCUSSION

Yield

Yield obtained from farmers practice (Broad casting method) 425 kg ha⁻¹ was found to be very less as compared to recommended practice (561 kg ha⁻¹). The results indicated that the on farm testing of technology gave good impact over average yield of horse gram to the farming community of South Bastar District as they motivated by the new agricultural technologies i.e. tractor drawn seed cum fertilizer drill (Table 2)

Economic return

The input and output prices of commodities prevailed during the testing were taken for calculating gross return, cost of cultivation, net return and benefit/cost ratio (Table 3). The cultivation of horse gram under improved technologies gave higher net return of Rs 8080 ha⁻¹ as compared to farmers practices of Rs 3420 ha⁻¹. The benefit cost ratio of horse gram under improved technologies was 2.36 as compared to 1.48 under farmer's practices. This may be due to higher yields obtained using seed cum fertilizer drill compared to local check (farmers practice).

Cost of seeding

Quantity of seed required for line sowing of horse gram was found to be less 27 kg ha⁻¹ as compared to broadcasting manually 49 kg ha⁻¹. Hence improved technology reduce 44.89 per cent cost of seeding as compared to local practice.

Reasons for low yield of horse gram at farmers field

Lack of popularization of seed cum fertilizer drill for sowing horse gram. Farmers had been sowing seed as broadcast method due to which the plant population was sometimes 2-3 times more than the recommended one.

Extension activities

Training programmes off campus as well as on campus, group discussions, exposure visits, field days,

news papers coverage (Fig. 3) these extension activities were conducted in collaboration with farmers to popularize this technology TD Seed cum fertilizer drill use for line sowing of horse gram. Due to concerted effort by KVK, this technology was spread to other block as well as other nexal affected district of Chhattisgarh.

Farmers readily accepted this technology as seeing believes. It involves less cost of cultivation than traditional method. Yield (grain yield) was an increase of about 24.24 percent in over the local check. Such increase was recorded with extra expenditure of horse gram seed sowing through local practices which could be afforded even by small and marginal farmers. Seed rate was found to be very less 27 kg ha⁻¹ as compared to manually broad casting 49 kg ha⁻¹. Time required to sowing of horse gram was very less and easy for sowing operation. As found in the results the B:C ratio (2.36) was sufficiently high to motivate the farmers for adoption of the improved technology due to require less input cost and easy for inter cultural operations.

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