



On-farm Demonstration of Ananta Groundnut Planter in Farmers Fields of Ananthapuram District

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ABSTRACT

On-farm demonstrations were conducted in 17 villages of Anantapuram district in an area of 6.8 hectares during kharif season over a period of 5 years from 2008-09 to 2012-13. Two types of sowing machinery i.e, Ananta groundnut planter and bullock drawn seed drill were used for sowing of groundnut. Demonstrations revealed that the recommended seed rate of 100 kg ha⁻¹ was dropped by the Ananta groundnut planter due to well designed metering mechanism, while it was not possible in bullock drawn seed drill because of manual dropping of seed. Higher plant height, yield attributes and 6.5 per cent more yield of groundnut was recorded with Ananta groundnut planter compared to bullock drawn seed drill. Pod yield 767.8 kg ha⁻¹ was obtained with Ananta groundnut planter. It was 720.8 kg ha⁻¹ with bullock drawn seed drill.

Key words : Ananta groundnut planter, Groundnut, Tractor drawn seed drill.

Groundnut is the major oilseed crop cultivated in an area of 7.06 lakhs hectares in Anantapuram district of Andhra Pradesh under rainfed conditions with average productivity of 400 kg ha⁻¹ (Hand Book of Statistics, 2011). The average rainfall of Anantapuram district is 520 mm, which is the second lowest rainfall received after Jaisalmer (Rajasthan) in India. The major soil groups of the district are red earths with loamy sub-soil and red sandy loams classified under arid soils. These soils are having less water holding capacity and sloppy in nature. The soils are both thirsty and hungry. In Anantapuram district the optimum time of sowing for groundnut is from June to July, in this period, immediately after receiving rains due to south – west monsoon, the farmer has to sow the seed within 2-4 days from the day of receiving rains before the moisture gets evaporated from the soil. Most of the farmers in the Anantapuram district use bullock drawn 4 row local seed drill for sowing of groundnut. The main disadvantage with this local seed drill is that uniform intra row distance is not maintained as recommended (10 cm) in a row and higher seed rate (150 – 180 kg ha⁻¹) was dropped than the recommended (100 kg ha⁻¹) due to manual operation (John Wesley, 2002).

The field study with Pantnagar zero till drill for lentil cultivation in farmers fields revealed that there was a significant difference in yield between three treatments with highest yield of 12.63 q ha⁻¹ (zero – till drill), followed by 9.5 q ha⁻¹ (reduced tillage) and minimum 7.54 q ha⁻¹ (conventional method) (Singh and Singh, 2006).

To mechanize the sowing operation for groundnut and to get the recommended seed to seed distance in a row and recommended quantity of seed per hectare, Ananta groundnut planter which is a tractor drawn 8–row groundnut planter was developed and evaluated its performance at Agricultural Research Station, Anantapuram (John Wesley, 2002).

Considering the above points, on-farm demonstrations were conducted under supervision of DAATT Center, Anantapuram to popularize the Ananta groundnut planter among the farmers. The feasibility of testing Ananta groundnut planter was done in farmers fields for five years during *kharif*, 2008-09 to 2012-13. The comparison was made between Ananta groundnut planter and local bullock drawn seed drill for sowing of groundnut.

MATERIAL AND METHODS

On-farm demonstrations were conducted in 17 villages in an area of 13.6 hectares during

Table 1. Details of On-farm demonstrations.

S. No.	Year	No. of villages	No. of locations	Area (ha)
1.	2008 – 09	4	4	3.2
2.	2009 – 10	2	2	1.6
3.	2010 – 11	5	5	4.0
4.	2011 - 12	3	3	2.0
5.	2012 - 13	3	3	2.4
	Total	17	17	13.6

Table 2. Specifications of Ananta planter and bullock drawn seed drill.

S. No.	Parameter	Ananta planter	Bullock drawn seed drill
1.	Power source	Tractor of 35 H.P or above	Two medium size bullocks
2.	Number of rows	8	4
3.	Row to row spacing (cm)	30	30
4.	Working width (cm)	240	120
5.	Type of seed metering mechanism	Inclined plate	Manual dropping
6.	Overall length, width and height (cm)	250 x 105 x 114	108 x 45 x 110
7.	Type of frame	Spring type	Rigid type
8.	Seed box capacity (Kg)	40	—
9.	Weight (Kg)	400	35

Kharif season over a period of 5 years. The details are given in Table 1. Two types of sowing machinery (specifications given in Table. 2) were used for sowing of groundnut. Plot size for each treatment of on-farm demonstration was 4000 m². The treatments consists of T₁ : Tractor drawn 8-row Ananta groundnut planter T₂ : Bullock drawn 4-row seed drill.

The field performance of Ananta groundnut planter in terms of inter and intra row spacing, depth of sowing and seed rate was evaluated by following the standard procedures (Mehta *et al.*, 2005). Similar parameters were evaluated for control plot. The initial plant population m⁻² at 15 days after sowing, final plant population m⁻² and pod yield at the time of harvesting were recorded, economics was calculated for both treatments.

RESULTS AND DISCUSSION

The results on the performance of Ananta groundnut planter and bullock drawn seed drill are given in Table 3. The average seed to seed distance

in a row was 10.1 cm in case of Ananta groundnut planter and 6.9 cm in bullock drawn seed drill. The seed was dropped at a depth of 5.1 cm in Ananta groundnut planter while it was 5.5 cm in bullock drawn seed drill. One and half time more seed rate was used in bullock drawn seed drill (159 kg ha⁻¹) compared to Ananta groundnut planter (108 kg ha⁻¹). The recommended seed rate of 100 Kgha⁻¹ was dropped by the Ananta groundnut planter due to well designed metering mechanism, while it was not possible in bullock drawn seed drill because of manual dropping of seed. Hence, 40-50 kg groundnut seed can be saved without any wastage by sowing groundnut with Ananta planter compared to local bullock drawn seed drill.

There is a reduction in manpower in Ananta groundnut planter as compared to bullock drawn seed drill where in 3 persons are required for groundnut sowing. These results are in agreement with Madhusudhan Reddy *et al.*, (2012).

Due to well designed inclined seed metering mechanism in Ananta groundnut planter permitted

Table 3. Performance of Ananta groundnut planter in farmers fields in comparison with bullock drawn seed drill (Farmers practice) (Mean of 5 years).

S. No.	Parameter	Ananta planter	Bullock drawn seed drill
1.	Number of rows	8	4
2.	Row to row spacing (cm)	30	30
3.	Depth of sowing (cm)	5.1	5.5
4.	Seed to seed spacing (cm)	10.1	6.9
5.	Seed rate (kg ha ⁻¹)	108	159
6.	Number of labourers	1	3
7.	Initial plant population m ⁻²	33.2	42.8
8.	Final plant population m ⁻²	28.0	38.2
9.	Plant height (cm)	29.7	28.2
10.	No. of Pods plant ⁻¹	9.1	8.4
11.	100 pod weight (gm)	44.3	40.1
12.	100 seed weight (gm)	20.7	18.1
13.	Pod yield (kg ha ⁻¹)	767.8	720.8
14.	Cost of cultivation (Rs ha ⁻¹)	15470	19650
15.	Gross Returns (Rs ha ⁻¹)	29146	27390
16.	Net Returns (Rs ha ⁻¹)	13676	7740
17.	C:B ratio	1:0.9	1:0.4

to drop seeds at specified inter and intra row spacing it resulted in initial plant population 33.2 plants m⁻² compared to 42.8 plants m⁻² in bullock drawn seed drill due to manual dropping of seeds. Similar results were reported by Madhusudhan Reddy *et al.*, (2012). Higher plant height, yield attributes and 6.5 per cent more yield of groundnut was recorded with Ananta groundnut planter compared to bullock drawn seed drill. Pod yield of 767.8 kg ha⁻¹ was obtained with Ananta groundnut planter while it was 720.8 kg ha⁻¹ with bullock drawn seed drill. Due to high pod yield of groundnut with Ananta groundnut planter it resulted in high gross, net returns and cost benefit ratio. Hence an amount of Rs. 4,180 per hectare could be saved on cost of cultivation with Ananta groundnut planter compared to bullock drawn seed drill.

CONCLUSIONS

Recommended inter and intra row spacing (10 cm), seed rate (100 kg ha⁻¹), plant population m⁻² (33 m⁻²) can be achieved by Ananta groundnut planter. Wastage of seed at the time of sowing, number of labourers required for sowing and cost

of cultivation can be reduced with Ananta groundnut planter. Bullock drawn seed drill did not give recommended output values for sowing of groundnut crop.

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(Received on 1.10.2013 and revised on 28.08.2014)