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Performance of groundnut var. Dheeraj in Western Mandals of Chittoor dt.

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Abstract
A new variety of Groundnut Dheeraj (TCGS 1073), released by RARS, Tirupati in the year 2018 was introduced in the district by KVK Kalikiri, which is a water-use efficient spanish bunch culture with high yield potential matures in 105-110 days suitable for cultivation in irrigated situation both in *Kharif* (2.37 t ha^{-1}) and Rabi (3.44 t ha^{-1}) seasons.. KVK, Kalikiri assessed the performance of Dheeraj over Kadiri 6 in On Farm Trials during 2017-18 and 2018-19; Front Line Demonstrations during 2019-20. Dheeraj (TCGS 1073) has shown advantage over Kadiri 6 in terms of yield attributes and yield. Average yield of Dheeraj was 22.7 q ha^{-1} with net returns and C: B ratio of 51833 Rs ha^{-1} and 1:2.1, respectively. Whereas, Kadiri 6 recorded yield of 18.0 q ha^{-1} with net returns and C: B ratio of 31000 Rs ha^{-1} and 1:1.7, respectively. It has been concluded that significant difference between Dheeraj and Kadiri 6 was observed with regard to yield parameters, yield and C:B ratio.

Keywords: groundnut, yield, economics

Introduction
Groundnut is one of the major oilseed crops of India accounting for 25% of total oilseed production in the country. But its production and productivity needs to be enhanced significantly to meet the national shortage of edible oil in India, which is about 14.10 kg/head/year against the balanced requirement of 14.80 kg/head/year. India is the second largest producer of groundnut after Brazil, accounting for 22.98 per cent of the total area and 14.52 per cent of the production of the world. It occupies an area of 5.30 million ha with a production of 5.50 million tonnes and productivity of 1040 kg/ha. Andhra Pradesh ranks second in the country both in area (13.07 l.ha) and production (8.45l.t) with an average productivity of 646 kg/ha (http://www.indiastat.com). Chittoor dt is one of the important Groundnut growing districts of Andhra Pradesh. The crop is cultivated in 94620 ha during *Kharif*, 2019-20 and 13873 ha during Rabi, 2019-20 in Chittoor dt. Groundnut is cultivated in diverse agro-climatic environments characterized by soils of varying water holding capacity under rainfed as well as irrigated conditions (Priya *et al*, 2016) [4]. In western mandals of Chittoor dt, farmers are growing varieties with low yield potential and low water use efficiency. Even though it is a fairly drought tolerant, production fluctuates considerably as a result of rainfall variability. This is because farmers are afraid of low yields due to scarcity of water during the lean season (Aruna *et al*, 2017) [1]. Growing of varieties with less water use efficiency gives low yields when there is shortage of water and also farmers with assured irrigation are in need of high yielding irrigated groundnut variety. Water use Efficiency is one of such trials that can contribute to productivity when water resources are limited (Wright *et al*., 1994) [3]. To mitigate the problems, a new variety of Groundnut (TCGS 1073) released by RARS, Tirupati in the year 2018 which has high yield potential was introduced in the dist. by KVK, Kalikiri which has high water use efficiency than Kadiri 6 which is in vogue in the western mandals of Chittoor district. Promoting irrigated groundnut variety TCGS 1073 (Dheeraj) will help the farmers to gain higher returns. Dheeraj, a bold seeded variety can be grown during early Kharif (march-April) under irrigated conditions; during Kharif in assured rainfall areas with scope of supplemental irrigation during prolonged dry spells; Kharif under irriated conditions; Rabi (November-December sowings); Rabi rice fallows (January sowings). Whereas, Kadiri 6 is suitable during Kharif- irrigated, Rabi (November-December sowings) and Rabi rice fallows (January sowings). Seed rate for TCGS 1073 is 80-85 kg/ac and sowing was done at 22.5 cm spacing between rows using seed drill, whereas, Kadiri 6 seed rate was 70-75 kg/ac with spacing of 22.5 cm rows sown with seed drill.

The KVK, Kalikiri assessed the performance of TCGS 1073 over Kadiri 6 in On Farm Trials during 2017-18 and 2018-19; and Front Line Demonstrations during 2019-20 under assured irrigation conditions.

Materials and Methods

On farm Trials and Front Line Demonstrations on Dheeraj variety were conducted in red sandy loam soils in western mandals of chittoor dt during *Rab*i season in farmers fields at Mittapalli (CTM mandal) during 2017-18, Balamvaripalli (Piler) during 2018-19 and Guttapalem (Kalikiri) during 2019-20 in an area of 2.0 ha during 2017-18 and 2018-19; 4.0 ha during 2019-20 with 5 farmers during 2017-18 and 2018-19; 10 farmers during 2019-20. An improved variety of Groundnut TCGS 1073 (Dheeraj) was compared with Kadiri 6, a local variety grown by farmers in terms of yield attributes and yield. Data on the following parameters were recorded:

Data recorded

1. Number of pods/plant
2. Number of seeds/pod
3. Shelling percentage
4. 100 seed weight
5. Yield

Economics was calculated as shown below

Cost of cultivation (Rs. ha^{-1})

Cost of cultivation (₹ ha^{-1}) was calculated considering the prevailing charges of agricultural operations and market price of inputs involved.

Gross returns (Rs. ha^{-1})

Gross returns were obtained by converting the harvest into monetary terms at the prevailing market rate during the course of studies.

Gross return (₹ ha^{-1}) = (Seed yield x price)

Net returns (Rs.ha^{-1})

Net returns were obtained by deducting cost of cultivation from gross return.

Net returns (₹ ha^{-1}) = Gross return (₹ ha^{-1}) - Cost of cultivation (₹ ha^{-1})

Cost: Benefit ratio

The benefit: cost ratio was calculated by dividing gross returns by cost of cultivation.

$$\text{Cost: benefit ratio} = \frac{\text{Gross returns (₹ ha}^{-1}\text{)}}{\text{Cost of cultivation (₹ ha}^{-1}\text{)}}$$

Table 1: Salient features of Dheeraj (TCGS 1073) and Kadiri 6

Variety	Duration	Pod yield (q/ac)		Shelling %	100 seed weight (g)	SMK %	Oil content (%)	Special features
		Kharif	*Rabi*					
Dheeraj	100-105	8-9	16-18	74-76	50-55	90	50	Water-use efficient, heat and cold tolerant, bold seeded with 100 seed weight of 51-70 g.
Kadiri 6	100-105	8-8.8	16-17	72	40-45	89	48	Popular among farmers for its quality attributes

Advantages of TCGS 1073 (Dheeraj) over Kadiri 6

High Water Use Efficiency: TCGS 1073 has high water use efficiency which means it gives high yield per unit of water intake compared to Kadiri 6, high yielding variety with assured irrigation.

Results and Discussion

Table 2: Yield attributes of improved variety TCGS 1073 and check variety Kadiri 6

Year	No. of pods/plant		Shelling %		100 seed weight (g)	
	Dheeraj	Kadiri 6	Dheeraj	Kadiri 6	Dheeraj	Kadiri 6
2017-18	28	26	71	68	48.0	38.0
2018-19	28	20	68	69	46.3	39.4
2019-20	27	25	70	69	49.0	39.0
Mean	27.7	23.7	69.7	68.7	47.8	38.8

Table 3: Summary of t-test in comparing 100 seed weight in treatment and farmers practice for three years

	Treatments	N	Mean	Std.Deviation	t-value	p-value
2017-18	Dheeraj	5	48.00	1.225	12.910**	0.000
	Kadiri 6	5	38.00	1.225	12.910**	0.000
2018-19	Dheeraj	5	46.30	1.061	9.748**	0.000
	Kadiri 6	5	39.40	1.175	9.748**	0.000
2019-20	Dheeraj	5	49.00	1.768	8.687**	0.000
	Kadiri 6	5	39.00	1.871	8.687**	0.000

**Significant at 1% level

Yield attributes: On an average no. of pods/plant in Dheeraj and Kadiri 6 were 27.7 and 23.7, respectively. Shelling % of Dheeraj was 69.7 and Kadiri 6 was 68.7. 100 seed weight of Dheeraj and Kadiri 6 was 47.8 and 38.8, respectively (Table 2). It has been concluded that there is significant difference between Dheeraj and Kadiri 6 with regard to 100 seed weight (Table 3).

Table 4: Yield and economics of improved variety TCGS 1073 and check variety Kadiri 6

Year	Yield (q ha^{-1})		% increase in yield over check	Gross returns (Rs ha^{-1})		Net returns (Rs ha^{-1})		B: C ratio	
	Dheeraj	Kadiri 6		Dheeraj	Kadiri 6	Dheeraj	Kadiri 6	Dheeraj	Kadiri 6
2017-18	28	22	27.3	112000	88000	57500	35000	2.05	1.7
2018-19	24	20	20	96000	80000	42000	26000	1.8	1.5
2019-20	16	12	33.3	96000	72000	56000	32000	2.4	1.8
Mean	22.7	18.0	26.9	101333	80000	51833	31000	2.1	1.7

*Yield was low during 2019-20 because of water shortage during crop growth period.

Table 5: Summary of t-test in comparing yield in treatment and farmers practice for three years

	Treatments	N	Mean	Std. Deviation	t-value	p-value
2017-18	Dheeraj	5	28.00	4.18	2.513*	0.036
	Kadiri 6	5	22.00	3.32	2.513*	0.038
2018-19	Dheeraj	5	24.00	1.23	6.325**	0.000
	Kadiri 6	5	20.00	0.71	6.325**	0.001
2019-20	Dheeraj	5	16.00	1.58	4.000**	0.004
	Kadiri 6	5	12.00	1.58	4.000**	0.004

*Significant at 5% level
**Significant at 1% level

Yield

Perusal of the data presented in the table 4 and fig.1 revealed that in demo plot, yield was found to be significantly higher than in control (farmers practice) during all the years (2016-17 to 2018-19). Dheeraj recorded mean yield of 22.7 q/ha. Whereas, Kadiri 6 recorded mean yield of 18.0 q/ha. During 2017-18, Yield difference between Dheeraj and Kadiri 6 was significant at 5% level. Whereas, during 2018-19 and 2019-20 it has been concluded that there is significant difference between Dheeraj and Kadiri 6 with regard to yield at 1% level (Table 5). The higher yield resulted due to more number of pods per plant and 100 seed weight as it is one of the important yields attributing character.

Table 6: Summary of t-test in comparing B: C ratio in treatment and farmers practice for three years

	Treatments	N	Mean	Std. Deviation	t-value	p-value
2017-18	Dheeraj	5	2.05	0.12	6.390**	0.000
	Kadiri 6	5	1.7	0.04	6.390**	0.002
2018-19	Dheeraj	5	1.8	0.05	10.954**	0.000
	Kadiri 6	5	1.5	0.04	10.954**	0.000
2019-20	Dheeraj	5	2.4	0.08	14.343**	0.000
	Kadiri 6	5	1.8	0.05	14.343**	0.000

**Significant at 1% level

Economics

Perusal of the data presented in the table 4 revealed that gross returns, net returns and B:C ratio were substantially higher in demo plot (TCGS 1073) compared to farmers practice-check variety (Kadiri 6). Mean gross returns of Dheeraj were 101333 Rs ha^{-1}. Whereas, in check plot, gross returns were 80000 Rs ha^{-1}. Mean net returns of Dheeraj were 51833 Rs ha^{-1}. Mean B:C ratio of Dheeraj was 2.1. Mean net returns in control plot were 31000 Rs ha^{-1} and mean B:C ratio was 1.7. During all the three years it has been concluded that there is significant difference between Dheeraj and kadiri 6 with regard to B:C ratio at 1% significant level (Table 6). Higher net returns and B:C ratio in Dheeraj were due to higher yields.

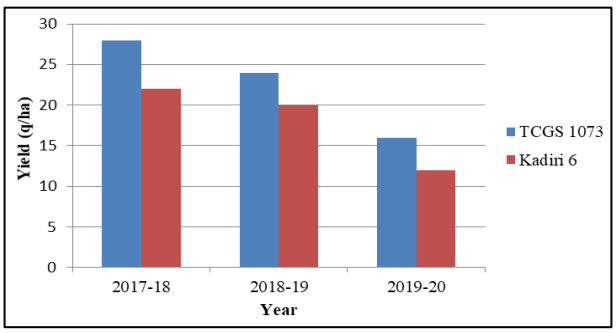

Fig 1: Performance of TCGS 1073 over Kadiri 6 in Western mandals of Chittoor dt

Output

Average grain yield was 22.7 q/ha (27% higher than Kadiri 6)

☞Gross returns were 27% high over Kadiri 6

☞Net returns were 67% high over Kadiri 6

☞Favourable benefit: cost ratio of 2.1 over 1.7 (Kadiri 6)

Conclusion

TCGS 1073 performed well under assured irrigated conditions with high water use efficiency and gave higher yield, net returns and C: B ratio over Kadiri 6. Number of pods/plant, pod and seed size and 100 seed weight were higher in Dheeraj which inturn gave higher yields. Significant difference in terms of yield and B:C ratio was observed in Dheeraj compared to Kadiri 6.

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Reference

1. Aruna KT, Satish Kumar U, Ayyana Gowdar MS, Srinivasa Reddy GV, Shanwad UK. Water Use Efficiency, Yield and Crop Coefficient (Kc) of

Groundnut crop under different Water Regimes. International Journal of Advances in Scientific Research. 2017;3(09):110-114.
2. http://indiastat.com
3. Wright GC, Nageswara Rao RC, Farquhar GD. Water use efficiency and carbon isotope discrimination in peanut under water deficit conditions. Crop Sci. 1994;34:92-97.
4. Priya T, Subramanyam D, Sumathi V. Performance of Groundnnut (*Arachis hypogaea* L.) cultivars under different plant populations during early Kharif. Indian Journal of Agricultural Research, 2016, 50-51.