J Krishi Vigyan 2021, 10 (1) : 200-203 DOI : 10.5958/2349-4433.2021.00092.1

Performance of Groundnut Varieties for Better Yield in Nagapattinam District of Tamil Nadu

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ABSTRACT

The present study was conducted during *kharif* 2017 in three villages of Nagapattinam district to assess the suitable variety of Groundnut. Five farmers' field were randomly selected and sown three high yielding improved varieties of groundnut namely Kadiri 9, CO 6 and ICGV 91114 with five replications with one check variety already grown by the farmers. The study revealed that Kadiri 9 recorded higher pod yield (19.87 q/ha), higher number of pods/plant (21.12), lesser root rot incidence (4.30 %) and optimum plant population (33.02 plants / M^2) as compared to CO 6 and ICGV 91114. Kadiri 9, CO 6, and ICGV 91114 recorded 35.15, 27.10 and 18.89 per cent higher yield than the check variety TMV 7, respectively. A reduction in root rot incidence, leaf minor, leaf spot, Spodoptera damage and optimum plant population was observed in all the three varieties as compared to check variety. Gross and net returns were Rs.1,19,220/- and Rs.73,990/- ha, respectively by cultivating Kadiri 9 as against Rs.77,280/- and Rs.37,824/-ha in the check variety. Hence, it was inferred that Kadiri 9 variety of ground nut proved better followed by CO 6 and ICGV 91114.

Key Words*:* Extension gap, Groundnut, Technology, Varieties, Yield.

INTRODUCTION

Groundnut or peanut (Arachis hypogaea L.) is an important food and cash crop for resource poor farmers in Asia and Africa. Due to its high monosaturated content, it is considered healthier than saturated oils and is resistant to rancidity. Groundnut is particularly valued for its protein content (26%). In addition to protein and oil, groundnut is a good source of Ca, P, Fe,B and Zn. Hence, groundnut played an important role in nutritional security to the resource poor farmers. In addition, the haulms provided excellent fodder for livestock, cake obtained after oil extraction was used in animal feed and overall the crop acted as good source of biological nitrogen fixation (Nautiyal *et al*, 2011). It is 6th most important oilseed crop in the world. It is habituated in the tropical, subtropical and warm temperate regions with average yield of 1520 kg/ ha. Groundnut crop can be cultivated in region were rainfall received from 500 to 1250 mm of rainfall. It cannot withstand severe drought, water logging and frost. The major groundnut production states are Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra. These five states contribute 86 percent of groundnut production in India. Tamil Nadu occupies 338300 ha with a production of 783200 t as per Arul Prasad *et al* (2019).

Groundnut growing areas in Nagapattinam district on 1737 ha was mostly under rainfed and irrigated condition. Important limitation other than irrigation is varietal preferences. As farmers were growing different local varieties during *kharif* season and save their own seeds over years for next sowing. Hence, the study was planned with the objectives to evaluate the improved groundnut varieties with high yield under *kharif* season. Method of sowing was by broadcast the seeds. The participatory rural appraisal study in the block reveals that the non availability of released variety suited to kharif season, farmers were cultivating

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Table 1. Details of practices in Nagapattinam district under.

Sr. No	Cultural practice	Improved practice	Existing practice
1.	Variety	Kadiri 9 , CO 6 and ICGV 91114	TMV 7
2.	Land preparation	Ploughing and Levelling	Ploughing and Levelling
3.	Pre emergent herbicide	Pendimethalin @ 1L/ha	No herbicide
4.	Seed rate	120 kg/ha	175 kg/ha
5.	Seed treatment	Biofertilizers & Pseudomonas	Non adoption of seed treatment
6.	Fertilizer dose	INM	Indiscriminate application
7.	Foliar application of nutrient	2 sprays of TNAU groundnut rich @ 5.0 kg/ha at 35 DAS and 45 DAS	Non adoption of foliar spray
8.	Plant protection	IPM	Indiscriminate application

the local variety of ground nut (TMV 7) which is low yielding, susceptible to root rot, leaf minor, leaf spot and Spodoptera . For control of these pests and diseases farmers were using pesticides indiscriminately which has led to increased cost of cultivation. Several biotic, abiotic and socio-economic constraints inhibit exploitation of the yield potential of groundnut and these are needed to bead dressed. Crop growth and yield are limited through poor plant nutrition and uncertain water availability during the growth cycle. Inappropriate management may further reduce the fertility of soil (Rabbinge, 1995). Therefore, it was considered to evaluate growth and yield parameters of three selected high yielding varieties of groundnut in Nagapattinam district to identify the most suitable variety at the farmers field for higher income.

MATERIALS AND METHODS

The present on farm study was conducted on the Clay loam soil during *kharif* 2017 in three villages of Nagapattinam district. Five farmers' field were randomly selected and sown three high yielding improved varieties of groundnut namely Kadiri 9, CO 6 and IGCV 91114 in five replication with one check variety already grown by the farmers. The chemical fertilizer was applied through DAP, muriate of potash and urea as basal dose. The details of cultural practices were given in Table1.

The recommended weed control measures and irrigation were applied according to requirement of the crop. The data like average Germination percentage (%),plant population (plants per M^2), number of pods per plant, pod yield (q per ha), haulm yield (kg per ha), root rot incidence (%), leaf miner (%), leaf spot (%), Spodoptera damage (%) were recorded during investigation. To estimate the technology gap, extension gap and technology index formula given by Samui *et al* (2000) was used.

RESULTS AND DISCUSSION

The highest germination percentage was recorded in variety Kadiri 9 (97.22%) followed by CO 6 (92.14%), ICGV 91114(93.84%). The variety Kadiri 9 has recorded highest number of plant population per M^2 (33.02) followed by CO 6 (29.82), ICGV 91114 (27.24). The reason may be attributed to the genetic variability and varietal difference and environmental adaptability. (Table 2)

The variety Kadiri 9 recorded maximum number of pods/plant (21.2) which was significantly higher with variety CO 6 (20.58) and ICGV 91114 (1.20). Highest yield of Kadiri 9 may be attributed to the cumulative performance of the genotype in terms of seed/ pod .Similar results were reported by Saravannan *et al* (2018). Farmers' check variety had minimum pods/ plant (13.50). The data (Table2)

Table 2. Performance of Ground nut varieties at farmers' field (Average of five trials).

Sr. No	Parameter	Kadiri 9	CO 6	ICGV 91114	TMV 7 (Check)	S.Ed.	C.D.(0.05)
1.	Germination percentage (%)	97.22	92.14	93.84	92.68	0.84	2.59
2.	Plant population (plants/m^2)	33.02	29.82	27.24	25.14	0.84	2.60
3.	Number of pods per plant	21.12	20.58	19.20	13.50	0.62	1.90
4.	Pod yield (q /ha)	19.87	17.67	15.88	12.88	0.41	1.27
5.	Haulm yield (kg/ ha)	4618	4020	3651	3418	64.3	198.3
6.	Root rot incidence (%)	4.30	5.62	4.84	7.78	0.12	0.38
7.	Leaf miner (%)	7.80	9.00	12.20	31.80	0.39	1.21
8.	Leaf spot (%)	3.44	4.98	6.70	18.80	0.34	1.05
9.	Spodoptera damage (%)	12.40	14.80	24.00	36.80	0.41	1.28

showed that root rot disease incidence (%) ranged between 4.30 to 5.62 per cent in three varieties whereas the farmers' practice recorded 7.78 per cent. Groundnut varieties, Kadiri 9, CO 6 and ICGC 91114 and recorded 35.17, 27.10 and 18.89 per cent higher pod yield than check variety TMV 7, respectively.

The maximum yield of ground nut was recorded in Kadiri 9 which was significantly superior to CO 6 and ICGV 91114. However, Kadiri 9 recorded highest yield in comparison to farmers' practice. Thus, the local variety/farmers' practice may be replaced with high yielding varieties because of higher productivity. With regard to haulm yield, Kadiri 9 variety recorded highest haulm yield of 4618 kg/ha as compared to other varieties. Lowest haulm yield was observed with TMV 7 (3418 kg/ ha).

The technology gap ranged between 1.47 and 5.13 q/ha. The observed technology gap was due to various constraints such as soil fertility, availability of low moisture content and climatic hazards *etc.* Hence, to reduce the yield gap location specific recommendations for varieties, soil testing and timely sowing appears to be necessary. A value of 3.00 to 6.99 q/ha of extension gap was found during 2017. There is a need to decrease this wider extension gap through latest techniques. (Table 3.) These findings were similar to the findings of Jain (2016) in pulses. The technology index showed the suitability of varieties at farmer's field. Lower technology values indicated that feasibility of variety among the farmers is more. The technology index ranged from 7.68 to 20.60 per cent. The finding was in accordance to finding of Sandhu and Dhaliwal (2016).

Gross and net returns were Rs.1,19,220/- and Rs.73,990/-ha, respectively by cultivating Kadiri 9 as against Rs.77,280/- and Rs.37,824/-ha in the check variety. The probable reason was lesser incidence of root rot disease coupled with higher number of pods/plant resulting higher pod and haulm yield, these results were in agreement with the findings of Vindhiyavarman *et al* (2010) and Murugan *et al* (2016). The gross cost of cultivation was almost similar for all the three varieties. Market preference for Kadiri 9 was good and fetched higher price. The yield, net return and B: C ratio was higher in Kadiri 9 due to higher market price followed by CO 6 and ICGV 91114.

CONCLUSION

The findings of the study revealed that cultivating Kadiri 9 and CO 6 in Cauvery delta districts like Nagapattinam district was more beneficial due to their yield contributing traits namely Germination

Table 3. Yield, technology gap, extension gap and technology index of Ground nut.

Name of Variety	Yield (q/ha.)			Per cent increase	Tech. gap (q/ha)	Ext. gap (q/ha)	Tech. index (%)
	Potential yield (q/ ha)	Improved practice	Farmers' Practice				
		Average	Average				
Kadiri 9	25.00	19.87	12.88	35.17	5.13	6.99	20.52
CO 6	19.14	17.67	12.88	27.10	1.47	4.79	7.68
ICGV 91114	20.00	15.88	12.88	18.89	4.12	3.00	20.6

Table 4. Yield and Economics of Ground nut varieties.

Variety	Yield (q/ha)	Economics of Trials (Rs./ha)			
		Gross cost	Gross income	Net income	B:C Ratio
Kadiri 9	19.87	45230	119220	73990	2.63
CO 6	17.67	43120	106020	62900	2.46
ICGV 91114	15.88	41560	95280	53720	2.29
TMV 7 (Check)	12.88	39456	77280	37824	1.95

percentage, plant population, number of pods per plant, yield which were recorded more as compared to farmers' choice variety i.e., TMV 7. The findings of the study concluded that the yield of Kadiri 9 was significantly higher than other varieties with recommended package and practices of Groundnut. Thus, the farmer's practice variety may be replaced with high yielding variety like Kadiri 9 in Nagapattinam district of Tamil Nadu.

REFERENCES

Arul Prasad S, Maragatham N,Prabhakaran N K, Deepakaran G A and Ragunathan K P (2019). Status of Groundnut Productivity Over Tamil Nadu. *Int J Agri Sci* **11**(9): 8391-8396.

Jain L K (2016). Impact assessment of frontline demonstration on green gram in Barmer district of Western Rajasthan. *J Food Legumes* **29**(3 & 4): 249-252.

Murugan P and Nisha P R (2016). Evaluation of high yielding groundnut varieties for North Eastern Zone of Tamil Nadu. *J Krishi Vigyan* **5**(1) : 64-66

Nautiyal P C, Zala P V, Tomar R K, Sodayadiya P and Tavethia B (2011). Evaluation of water use efficiency newly developed varieties of groundnut in on-farm trials in two different rainfall areas in Gujarat, India. SAT e-Journal / eJournal.icrisat.org (9):1-6.

Rabbinge R (1995). Ecoregional approaches, why, what and how. In: *Ecoregional approaches for sustainable land use and food production* (Bouma J, Kuybenhoven J, Bouman J, Luyten C. and Zandastra H G Ed). Kluwer Academic Publishers, Dordrecht, the Netherlands

Samui K, Maitra S, Roy D R, Mondal A K and Saha D (2000). Evaluation of frontline demonstration programme on groundnut. *J Indian Soc Coastal Agri Res* **18** (2): 180-183.

Sandhu B S and Dhaliwal N S (2016). Evaluation of frontline demonstration programme on summer moong in South Western Punjab. *J Food Legumes* **29** (3 & 4): 245-248.

Saravanan M, Rajkala A and Alagukannan G (2018). Assessment of Drought Tolerant and High Yielding Groundnut Varieties in Ariyalur District, India. *Int J Curr Microbiol App Sci* **7**(05): 3492-3499.

Vindhiyavarman P, Manivannan N, Nigam S N and Muralidharan V (2010). Farmers' participatory varietal selection in groundnut: A Case Study from Tamil Nadu, India. *Electronic J Pl Breed* **1**(4):878- 881.

Received on 20/5/2021 *Accepted on 10/8/2021*