Andhra Pradesh J Agril. Sci : 4(4): 280-282, 2018

PERFORMANCE OF *KHARIF* GROUNDNUT AS INFLUENCED BY RESOURCE CONSTRAINTS

B. SHRUTHI[1], Y. REDDI RAMU[2], A. PRATAP KUMAR REDDY[3] AND P.V.R.M. REDDY[4]

Department of Agronomy, S.V. Agricultural College, ANGRAU, Tirupati- 517 502, A.P.

Date of Receipt:18.6.2018 Date of Acceptance: 23.10.2018

ABSTRACT

A field trial was conducted at S.V. Agricultural College Farm, Tirupati, Acharya N. G. Ranga Agricultural University, Andhra Pradesh, India during *kharif*, 2017 to identify the hierarchy of production factors for efficient use of resources for optimum production of groundnut. The results revealed that adoption of recommended package of practices is highly remunerative for groundnut cultivation. Among the individual production factors, withdrawal of nutrients from full package of practices (FPP) alone caused substantial reduction in yield (35 %), followed by exclusion of weeding (27 %) and non-practising of *in-situ* moisture conservation (21 %). Thus nutrient management and weed management followed by *in-situ* moisture conservation emerged out to be the priority production factors in rainfed groundnut.

KEY WORDS: Groundnut, Full package of practices, Nutrient management and Weed management

INTRODUCTION:

Groundnut is an important oil seed crop in India, which is cultivated over an area of 4.97 m ha, with a production of 8.2 mt and an average productivity of 1674 kg ha^{-1}. In Andhra Pradesh, it is grown in an area of 7.4 m ha having an annual production of 1.0 mt with a productivity of 1367 kg ha^{-1} (www. Indiastat.com).

Rainfed farmers with their limited investment capacity cannot afford to adopt full recommended package of practices resulting limited per unit area productivity. Further farmers are neglecting the application of fertilizers, weed control and plant protection measures due to paucity of funds and lack of knowledge (Patil *et al*., 2003). Despite of various technological advances, crop yields in dryland areas continued to be low hence, there is an urgent need to explore the possibilities for increasing the productivity through better understanding of the constraints in production of oil seeds especially in groundnut. Efficient use of resources under constraint situation could be done by giving maximum emphasis to the particular inputs (practices), which contribute maximum towards yield. So, prioritizing production constraints in India is the need of the hour and also to explore researchable issues for enhancing the productivity of groundnut under rainfed ecosystem for climate resilience.

MATERIAL AND METHODS

The field experiment was conducted at S.V.Agricultural College Wetland farm, Tirupati, Acharya N. G. Ranga Agricultural University, Andhra Pradesh, India (13.5°N latitude and 79.5°E longitude, 182.9 m above mean sea level) during *kharif* season of 2017. The experiment was laidout in a Randomized Block Design with three replications. The treatments consists of T_1 : Control (only improved cultivar without any input),T_2 : Full Package of Practices (FPP), T_3 : FPP excluding *in-situ* soil moisture conservation, T_4 : FPP excluding protective irrigation, T_5 : FPP excluding nutrient management, T_6 : FPP excluding weed management, T_7 : FPP excluding pest management and T_8 : FPP excluding improved variety. The experimental field was sandy clay loam in texture which is low organic carbon (0.23 %).The soil is neutral in reaction (pH 6.8), low in available N (159 kg ha^{-1}) and medium in available phosphorus (24.3 kg ha^{-1}) and potassium (211.3 kg ha^{-1}). Total rainfall received during the crop growth period was 833.6 mmwith within 42 rainy days. The sowing was done @ 150 kg ha^{-1} with a tractor drawn seed drill of a spacing of 30 × 10 cm. Nitrogen, phosphorous and potassium were applied at the rate of 20-40-50 kg N, P_2O_5 and K_2O ha^{-1}in the form of urea,

*Corresponding author, E-mail:ramuagro@rediffmail.com

single super phosphate and muriate of potash respectively and gypsum @ 500 kg ha^{-1} was applied as per the treatments. Pre-emergence application of pendimethalin dose *fb* one hand weeding at 21 DAS was carried out to avoid competition from weeds as per the treatments. As a plant protection measure chlorpyriphos 2.5 ml/l of water was sprayed to control leaf miner. Dharani variety was taken as improved variety and K-6 variety as popular variety. The data was subjected to analysis of variance (ANOVA) as per the standard procedure. Means were separated using Fisher's least significant difference (LSD) test at 5% level of probability as stated in Gomez and Gomez (1984).

RESULTS AND DISCUSSION

Resource constraints environment significantly influenced the yield attributes *viz.,* number of filled and ill filled pods plant^{-1}, 100 pod weight and 100 kernel weight of groundnut. Full package of practices (T_2) recorded the highest yield attributes in groundnut which, was on par with FPP excluding protective irrigation (T_4), improved variety (T_8), pest management (T_7). FPP increased the dry matter production and efficient translocation of photosynthates as a result of better availability and utilization of growth resources owing to ample supply of nutrients, uniform distribution of rainfall, maintenance of weed free environment and incidence of pests and diseases below the ETL levels and thereby recorded significantly higher yield attributes of groundnut. These results are in conformity with those of Patro and Ray (2016), Sagvekar *et al*. (2017) and Sharma *et al*. (2015).

Data pertaining to pod yield and haulm yield of groundnut under resource constraints are presented in Table 1. Among all the treatments, adoption of full package of practices (T_2), recorded significantly higher pod (2315 kg ha^{-1}) and haulm yield (3302 kg ha^{-1}) in groundnut which, was however comparable with full package excluding protective irrigation (T_4) or improved variety (T_8) or pest management (T_7) compared to the rest of the treatments.

Among the individual production factors, excluding of nutrient management, weed management and *in-situ* moisture conservation caused the 35 per cent, 27 per cent, 21 per cent reduction in pod yield respectively compared with control. This situation clearly indicated that nutrient management and weed management are the important management practices followed by *in-situ* moisture conservation on the order of priority under favourable weather conditions. Further nutrients, weed management and *in-situ* soil moisture conservation played a crucial role for enhancing the pod yield in groundnut. These results are inline with those of sagvekar *et al*. (2017) in groundnut and Patil *et al*. (2003) in safflower.

CONCLUSION

In conclusion, the study revealed that nutrient management and weed management followed by *in-situ* soil moisture conservation are the priority production factors for enhancing the productivity, quality and economic returns of rainfed groundnut under favourable weather conditions in sandy clya loam soils of Southern zone of Andhra Pradesh.

LITERATURE CITED

Gomez, K.A and Gomez, A.A. 1984. *Statistical Procedure for Agricultural Research*. International Rice Research Institute, Manila, Philippines. pp. 304-305.

http // www.indiastat.com, year

Patil, B.B., Ingavale, M.T and Mangave, K.K. 2003. Optimization of safflower production under resource constraints. *Madras Agricultural Journal*. 90 (10-12): 731-733.

Patro, H.K and Ray, M. 2016. Optimization of *kharif* groundnut production under resource constraints. *Plant Archieves*. 16 (10): 381-383.

Sagvekar, V.V., Waghmode, B.D., Kamble, A.S and Mahadkar, U.V. 2017. Optimization of groundnut (*Arachis hypogaea* L.) production technologies under various resource constraints in Konkan region. *International Journal of Current Microbiology and Applied Sciences.* 6 (7): 1498-1503.

Sharma, S., Ram, A., Jat and Sagarka, B.K. 2015. Effect of weed management practices on weed dynamics, yield, and economics of groundnut (*Arachis hypogaea* L.) in black calcareous soil. *Indian Journal of Agronomy.* 60 (2): 312-317.

Table 1. Yield attributes and yield of groundnut as influenced by production factors

Treatments	Yield attributes			Yield		
	Hundred pod weight (g)	Hundred kernel weight (g)	No. of filled pods plant^{-1}	Pod yield (kg ha^{-1})	Haulm yield (kg ha^{-1})	Shelling percentage (%)
T_1 : Control (only improved cultivar without any input)	94.2	34.6	9.1	940	1980	60.53
T2 : Full Package of Practices	118.0	50.5	15.0	2315	3302	76.6
T3 : FPP excluding *in-situ* soil moisture conservation	106.1	42.2	12.2	1830	2850	69.33
T4 : FPP excluding protective irrigation	116.0	49.3	14.2	2212	3219	75.33
T5 : FPP excluding nutrient management	102.6	40.0	11.5	1500	2600	66.83
T6 : FPP excluding weed management	104.8	41.8	12.0	1690	2640	67.26
T7 : FPP excluding pest management	114.0	46.5	14.0	2090	3200	72.93
T8 : FPP excluding improved variety	115.0	48.0	14.1	2174	3206	74.95
SEm ±	2.3	1.3	0.42	75	91	0.42
CD (P = 0.05)	7.1	4.0	1.3	230	280	1.29