



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology
Vol. 10, Issue, 09, pp.10239-10241, September, 2019

RESEARCH ARTICLE

EFFECT OF ORGANIC MANURE ON SHORT DURATION TABLE GROUNDNUT IN ASSOCIATION OF AGRO-CHEMICAL

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ARTICLE INFO

Article History:

Received 12th June, 2019
Received in revised form
15th July, 2019
Accepted 18th August, 2019
Published online 30th September, 2019

Key words:

Cultivar AVTAR, FYM doses, Nutrient combination, Profitability, Tablegroundnut.

ABSTRACT

The field study was laid out during two consecutive rainy seasons at Regional Research Station Mainpuri, C.S. Azad University of Agriculture & Technology, Kanpur. The experimental soil was sandy loam with poor fertility status. The table groundnut ICGV 93468 (AVTAR) was tested under different doses of farm yard manure with recommended dose of fertilizer i.e., 20 kg N + 30 kg P₂O₅ + 45 kg Ca + 200 kg gypsum/ha. Among the different doses of nutrient combination, farm yard manure 100 q + RDF/ha registered significantly higher pod yield of table groundnut by 29.75 q/ha over control, conventional system and tested dose FYM started from 20 q/ha to 80 q/ha without increasing the maturity period. Application of FYM 120 q + RDF/ha did not show any significant response over the FYM 100 q + RDF/ha. Application of 100 q + RDF/ha gave highest gross income (Rs. 163625/ha), net return (Rs 98555/ha) and BCR (1:2.51), these values at par with the application of FYM 120 q + RDF/ha. Therefore, application of FYM 100 q + RDF was found suitable for harvesting of table groundnut cv. ICGV 93468 (AVTAR).

Citation: Singh, R.A., Shanker Singh, Renu Singh, Singh, R.K. and Ram Prakash, 2019. "Effect of organic manure on short duration table groundnut in association of agro-chemical", *Asian Journal of Science and Technology*, 10, (09), 10239-10241.

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INTRODUCTION

Farm yard manure is the traditional organic manure, prepared by farmers themselves on own farms. It is most readily available to the farming majority. It is product of decomposition of solid excreta of live stock, store in the farm alongwith the little amount of straw etc. On an average well rotted farm yard manure contains 0.5% N, 0.2% P₂O₅ and 0.5% K₂O. High dose of farm yard manure can be applied under intensive irrigated cropping conditions e.g., about 25 tonnes per hectare for sugarcane, vegetables, potatoes, rice etc., 12.5 tonnes for irrigated or rainfed crops, where the rainfall is medium to heavy (about 1250 mm) and from 5 to 7 tonnes in dry areas, where rainfall is low (about 500 mm). In dry farming areas (rainfall below 500 mm) application of 2.5 tonnes of farm yard manure/ha give significant increase in crop yield (Singh et al. 2017). Groundnut is a light soil loving crop, therefore, it is cultivated in 84 countries producing > 35 million tonnes with productivity about 1350 kg/ha. The requirement for this crop is dependent much in aerial (temperature, radiation, humidity etc.), edaphic (soil moisture and aeration etc.), pedological (soil depth, soil reaction etc.), technological (fertilizer, pesticides) and other factors. In early, 1980's groundnut was grown in U. P. on 0.30 million ha with

production of 0.19 million tones. Since then both area and production have shown a steady decline due to biotic and abiotic reasons. During 2002-03 groundnut area declined from 0.30 million ha to 0.07 million ha and production from 0.19 million tones to 0.04 million tones and thereafter, the area and production continuous declined (Anonymous, 2004). Nutrient deficient soil, poor organic matter in soil, long duration varieties, spreading nature diseases susceptible etc. are major factors for poor productivity of pods of groundnut. Frogi rains create the moisture stress condition, which affect the pegging in groundnut as they hunged upward with aerial parts of plants. A strong need was felt to searched out the suitable dose of farm yard manure in the conjunction with other agro-chemical for nutrients deficient soils. The application of organic amendment in soil hold the moisture upto larger period and form crumbi structure into soil, this condition facilitate to the pegging activity in groundnut. Therefore, the conjunction of farm yard manure with other agro-chemical is the subject matter of this manuscript.

MATERIALS AND METHODS

The experiment was laidout during rainy season of 2002 and 2003 at Regional Research Station, Mainpuri, C.S. Azad University of Agriculture & Technology, Kanpur.

Table 1: Pod yield of table groundnut (q/ha)

S. N.	Treatment	Pod yield (q/ha)		
		2002	2003	Pooled
1.	Control	13.15	13.34	13.24
2.	Conventional system	21.30	21.76	21.53
3.	FYM 20 q + RDF	23.28	23.53	23.40
4.	FYM 40 q + RDF	24.14	24.49	24.31
5.	FYM 60 q + RDF	25.48	25.84	25.66
6.	FYM 80 q + RDF	26.21	26.63	26.42
7.	FYM 100 q + RDF	29.35	30.16	29.75
8.	FYM 120 q + RDF	29.48	30.21	29.84
	SE (m±)	0.21	0.20	-
	C.D. 5%	0.63	0.60	-

Table 2. Cost of cultivation, gross return, net return and BCR under different treatments

S. N.	Treatment	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	BCR
1.	Control	62320	72820	11500	1:1.18
2.	Conventional system	62570	118415	55845	1:1.89
3.	FYM 20 q + RDF	63070	128700	65630	1:2.04
4.	FYM 40 q + RDF	63570	133705	70135	1:2.10
5.	FYM 60 q + RDF	64070	141130	77060	1:2.20
6.	FYM 80 q + RDF	64570	145310	80740	1:2.25
7.	FYM 100 q + RDF	65070	163625	98555	1:2.51
8.	FYM 120 q + RDF	65570	164120	98550	1:2.50

The experimental soil was sandy loam, having pH 8.5, organic carbon 0.45%, total nitrogen 0.04%, available phosphorus 10 kg/ha and available potassium 278 kg/ha, thus, the nutrients of experimental soil were analysed low in organic carbon, total nitrogen, available phosphorus and high in available potassium. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was determined by Colorimetric method (Datta, *et al.*, 1962). Total nitrogen was analysed by Kjeldahl's method as discussed by Piper (1950). The available phosphorus and potassium were determined by Olsen's method (Olsen *et al.*, 1954) and Flame photometric method (Singh, 1971), respectively. Eight treatment i.e., control, conventional system, FYM 20 q + RDF, FYM 40 q + RDF, FYM 60 q + RDF, FYM 80 q + RDF, FYM 100 q + RDF, and FYM 120 q + RDF/ha were tested. The groundnut variety ICGV 93468 (AVTAR) was planted in second fortnight of July and harvested in first fortnight of October after 87 days of seeding during both the experimental years as suggested by Singh (1999), Singh (2000) and Singh (2001). Recommended dose of fertilizer (RDF) @ 20 kg N + 30 kg P₂O₅ + 45 kg K₂O + 200 kg gypsum was conjuncted with different doses of farm yard manure. The recommended agronomical practices were followed as suggested by Singh (1999), Singh (2000) and Singh (2001). The experiment was laid out in RBD with three replications. The experimental data of two years were statistically analysed as suggested by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

The yield data obtained were statistically analysed and reported in Table 1 and discussed here under appropriate heads.

Pod yield of groundnut under different nutrients combination: Among the different doses of nutrient combination, FYM 100 q + RDF/ha registered significantly higher pod yield of table groundnut (29.75 q/ha) during rainy season over control, conventional system and tested dose of FYM started from 20 q/ha to 80 q/ha without increased of maturity period.

Application of FYM @ 120 q/ha did not show the significant response over the 100 q FYM/ha. The higher doses of FYM in integration with recommended dose of 20 kg N + 30 kg P₂O₅ + 45 kg K₂O + 200 kg gypsum developed the crumbly structure into soil and maintained soil moisture upto longer time, facilitated to pegging of table groundnut. The maximum pegging bore into soil was maximized the pods formation. Therefore, higher number of pods bearing was responsible for highest pod yield of table groundnut. The lower pod yield was harvested under control treatment by 13.24 q/ha, this was due to lower pods formation. The similar results has also been reported by Singh (2004).

Profitability from different nutrients combination: Data given in Table 2 clearly displayed that FYM 100 q + RDF/ha gave highest gross income (Rs 163225/ha), net return (Rs 98555/ha) and BCR (1: 2.51), closely followed FYM 120 q + RDF/ha. Application of FYM 120 q + RDF/ha gave gross income (Rs 164120/ha), net return (Rs 98550/ha) and BCR (1:2.50). Thus, FYM 100 q + RDF/ha and FYM 120 q + RDF/ha gave at par gross income, net return and BCR. The other nutrients combination doses failed to give good profitability in comparison to FYM 100 q + RDF/ha and FYM 120 q + RDF/ha.

Conclusion

The farm families residing in the riverine tract of Uttar Pradesh, where groundnut cultivation is the vigour may be advocated for cultivation of table groundnut cv. ICGV 93468 (AVTAR) with the application of FYM 100 q + RDF/ha for obtaining the highest pod yield and net return during rainy season.

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