

Response of Confectionery Groundnut (*Arachis hypogaea* L.) Varieties to Farm Yard Manure

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Abstract: Field experiments were conducted at Coconut Research Station, Aliyarnagar, Tamil Nadu Agricultural University, during *kharif* 2004 and 2005 to find out a suitable confectionery groundnut variety and optimum quantity of Farmyard manure required for maximizing the groundnut yield. The treatments comprised of four varieties viz., CO 3, VRI 2, TG 41 and TG 42 and four levels of FYM viz., 12.5 t ha⁻¹, 15.6 t ha⁻¹, 18.8 t ha⁻¹ and 21.9 t ha⁻¹. The results revealed that among the different confectionery groundnut varieties, the variety CO 3 recorded the highest DMP, pod yield (2438 kg ha⁻¹), haulm yield (4390 kg ha⁻¹), net return and BCR (3.01). Among the different quantities of FYM tested, application of 21.9 t ha⁻¹ (175 % recommended level of FYM) recorded the highest DMP, pod yield (2476 kg ha⁻¹), haulm yield, net return and BCR (2.87).

Keywords: Confectionery groundnut, varieties, FYM, yield, economics, B: C ratio

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an important oilseed crop grown in both developed and developing countries of the world for the production of oil and protein. In India, groundnut is primarily used as an oil seed crop; it is also consumed directly as food because of its palatability and nutritive value. Besides, oil (48%) and protein (22%), groundnut seed contains carbohydrates (10%), minerals (3%) and B complex vitamins. More than 70 per cent of world's total groundnut production is being utilized for edible oil, 20 per cent for seed purpose and limited quantity of groundnut kernel is used for direct consumption as confectionery^[7]. The large seed size is of considerable importance for direct consumption. Studies on confectionery groundnut are scanty to provide adequate information for recommendation to confectionery purpose. Hence the present study was undertaken to find out a suitable confectionery groundnut variety and optimum dose of FYM to be applied to confectionery groundnut for higher yield.

MATERIALS AND METHODS

Field experiments were conducted at Coconut Research Station, Aliyarnagar, Tamil Nadu Agricultural University Tamil Nadu, India during *kharif* 2004 and 2005 to find out a suitable confectionery groundnut

variety and optimum quantity of FYM to be applied for maximizing the groundnut yield. The soil of the experimental field was sandy loam. The nutrient status of the soil was low in available nitrogen (225 kg ha⁻¹ and 195 kg ha⁻¹), medium in available phosphorus (12.8 kg ha⁻¹ and 12.8 kg ha⁻¹) and medium in available potassium (250 kg ha⁻¹ and 250 kg ha⁻¹) during *kharif* 2004 and 2005, respectively. The experiment was laid out in a split plot design with three replications. Four varieties suitable for confectionery were allotted in the main plot viz., CO 3, VRI 2, TG 41 and TG 42 and four doses of FYM were fitted in the sub plot viz., 12.5 t ha⁻¹ (100 % recommended level), 15.63 t ha⁻¹ (125 % recommended level), 18.80 t ha⁻¹ (150 % recommended level) and 21.9 t ha⁻¹ (175 % recommended level). The recommended dose of fertilizers was applied as basal uniformly to all the treatments. Observations on drymatter production at harvest, yield attributes, yield of pod and haulm were recorded. Net return and benefit cost ratio were calculated based on the prevailed prices of the produce and inputs.

RESULTS AND DISCUSSIONS

Drymatter Production: Among the different confectionary groundnut varieties, CO 3 recorded the highest DMP of 5.38 and 5.89 t ha⁻¹ during *kharif* seasons of 2004 and 2005 respectively. Application of

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Table 1: Effect of varieties and FYM application on growth and yield parameters of confectionery groundnut

Treatments	DMP (Kg ha ⁻¹)		Pod number plant ⁻¹		Pod weight plant ⁻¹		Shelling %		100 kernel weight (g)	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
Varieties										
Co 3	5381	5891	18.9	15.9	38.8	28.1	65.8	57.2	48.1	49.5
VRI 2	4246	5374	15.0	13.9	30.2	24.3	58.8	50.7	48.2	45.5
TG 41	4819	5496	18.5	14.7	37.6	26.7	63.7	53.2	48.5	41.8
TG 42	3741	5402	13.0	11.4	25.3	22.0	57.3	45.5	48.3	40.0
FYM										
12.5 t FYM ha ⁻¹	4367	5273	15.2	12.8	29.1	22.4	60.1	46.0	48.0	39.2
15.6 t FYM ha ⁻¹	4482	5417	15.7	13.0	30.8	23.9	60.3	48.2	47.5	41.7
18.8 t FYM ha ⁻¹	4629	5597	17.1	14.4	35.1	26.8	62.2	54.5	49.0	46.3
21.9 t FYM ha ⁻¹	4708	5852	17.6	15.7	36.3	28.0	62.9	57.2	48.7	49.6
CD (P = 0.05)										
varieties	721	358	2.49	1.48	2.72	2.20	5.76	5.57	NS	NS
FYM	338	280	1.59	1.43	3.03	1.80	NS	3.59	NS	NS
V x F	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 2: Effect of varieties and FYM on yield and economics in confectionery groundnut

Treatments	Pod Yield (Kg ha ⁻¹)		Haulm yield (Kg ha ⁻¹)		Net Income (Rs)		BCR	
	2004	2005	2004	2005	2004	2005	2004	2005
Varieties								
CO 3	2438	2237	4390	5879	31413	19311	2.86	2.28
VRI 2	2125	2054	3825	5354	25418	13614	2.63	1.90
TG 41	2408	2134	4310	5587	30578	18047	2.82	2.03
TG 42	1985	1951	3462	5223	21527	12868	2.31	1.78
FYM								
12.5 t FYM ha ⁻¹	2107	1963	3527	5238	22655	12289	2.41	1.89
15.6 t FYM ha ⁻¹	2117	2058	3786	5360	25168	11056	2.53	1.75
18.8 t FYM ha ⁻¹	2256	2162	4171	5632	28944	20025	2.71	2.12
21.9 t FYM ha ⁻¹	2476	2193	4503	5813	32168	20469	2.87	2.14
CD (P = 0.05)								
varieties	251	321	456	275	-	-	-	-
FYM	250	194	300	155	-	-	-	-
Varieties x FYM	NS	NS	NS	NS	-	-	-	-

FYM 21.9 t ha⁻¹ produced the highest DMP both during *kharif* 2004 and 2005, respectively and it was followed by the application of 18.8 t FYM ha⁻¹. This might be due to additional nutrient supplied through FYM as reported by Samui *et al.*,^[6]. The favourable soil conditions provided by additional quantity of FYM in addition to supplying plant nutrients and the resultant higher uptake of nutrients especially N supplied by FYM might have influenced the LAI, DMP and the yield positively. Such a positive effect was reported by Agasimani and Babalad^[1] in groundnut.

Yield Characters: Significant variations in yield characters were observed among the groundnut varieties. The variety Co 3 recorded significantly the highest number of pods plant⁻¹ (18.9 and 15.9) during both the years.

Application of FYM to groundnut showed significant influence on the yield attributes of groundnut in both the years. Application of FYM had significant and positive effect on number of pods per plant. Application of FYM at 21.9 t ha⁻¹ produced the highest number of pods plant⁻¹ (17.6 and 15.7) both during *kharif* 2004 and 2005 respectively and it was followed by the application of

FYM 18.8 t ha⁻¹. This might be due to additional nutrient supplied through FYM. Similar finding was also reported by Samui *et al.*,^[6]. Pod weight was found to be higher in the variety Co 3 which recorded 38.8 and 28.1 g respectively in both seasons. The increase in pod weight might be due to inherent character of the variety which produced higher sized pod and kernel. The maximum pod weight was registered in 21.9 t FYM ha⁻¹ applied plot (36.3 and 28.0 g in the *kharif* 2004 and 2005, respectively). Highest shelling percentage was observed in the same variety (CO 3) i.e., 65.8 and 57.2 % in *kharif* 2004 and 2005 respectively. Application of 21.9 t FYM ha⁻¹ recorded the highest shelling percentage of 62.9 and 57.2%, respectively during both the years.

Yield: Among the different varieties tested, CO 3 recorded the highest pod yield of 2438 and 2237 kg ha⁻¹ which was 18% and 12% increase over control. This might be due to maximum production of pods with more pod weight and more shelling percentage. Application of 21.9 t FYM ha⁻¹ recorded the highest pod yield of 2476 and 2193 kg ha⁻¹. This is ascribed to better growth of groundnut plant at 21.9 t ha⁻¹ of FYM. These findings corroborate the results of Mathur *et al.*,^[5]. The increase in pod yield was 14 per cent and 10 per cent and that of haulm yield was 11 per cent and 9 per cent during 2004 and 2005. Agasimani and Hosmani⁽²⁾ recorded maximum groundnut pod yield in the treatment receiving FYM. This increase in pod yield was to the extent of 64 per cent compared to control. The work of Chittapur and Angadi^[4] who concluded that FYM application significantly increased the pod yield of groundnut also lends support to the present finding.

The increase in yield of crop due to application of FYM is not only because of improved nutrient availability, but also owing to its beneficial effects on physical and biological environment. This has special reference in the groundnut crop as pod setting and development takes place in sub surface soil and the crop is mainly grown in arid and semi arid climate where water storage capacity of the soil plays a vital role^[3].

Economics: Among the four varieties tested, the variety CO 3 recorded the highest net return followed by TG 41. Among the FYM levels, application of FYM @ 21.9 t ha⁻¹ recorded the highest net return followed by application of FYM @ 18.8 t ha⁻¹. The variety CO 3 also recorded the highest BCR of 2.86 and 2.28 during *kharif* 2004 and 2005, respectively. Among the FYM levels, application of FYM 21.9 t ha⁻¹ recorded the highest BCR of 2.87 and 2.14 respectively in *kharif* 2004 and 2005. The increase in net return and benefit cost ratio (BCR) was due to the increased yield in the respective treatments i.e. variety CO 3 and application of 21.9 t ha⁻¹ of FYM.

Conclusion: The results revealed that among the different confectionery groundnut varieties, the variety CO 3 recorded the highest DMP, yield (2438 kg ha⁻¹), haulm yield (4390 kg ha⁻¹), net return and BCR (3.01). Among the different quantities of FYM tested, application of 21.9 t ha⁻¹ (175 % recommended level of FYM) recorded the highest DMP, pod yield (2476 kg ha⁻¹), haulm yield, net return and BCR (2.87).

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