

Effect of spacing on improved cultivars of summer growing groundnut (*Arachis hypogaea*) in Red and Laterite zone of West Bengal

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ABSTRACT

A field experiment was conducted during summer season of 2004 and 2005 at All India Co-ordinated Research Project on Groundnut, Bidhan Chandra Krishi Viswavidyalaya, Regional Research Station, Jhargram, Paschim Medinipur to find out effect of spacing on improved cultivars of summer growing groundnut (*Arachis hypogaea*) in Red and Laterite zone of West Bengal. The highest pod yield was found in the variety TAG 24 (2856Kgha⁻¹) followed by ANDG50 (2798Kgha⁻¹), TG38-B (2569Kgha⁻¹) and DH101(2503Kgha⁻¹). Similarly kernel yield was found maximum in the variety TAG24 which was significantly superior than other varieties. The highest Shelling percentage was obtained with the variety TG38B. The 100 kernel weight was found maximum in the variety TG38B (41.8g and 42.2g in 2004 and 2005 respectively) and lowest was observed in the variety DH101 (34.2g and 34.2g in 2004 and 2005 respectively). All the varieties matured within 110-126 days after sowing. The highest BCR (3.56) was observed in the variety TAG24. in case of plant spacing 30 cm x 10 cm gave highest pod and kernel yield as compared to closer spacing (20cm x10cm) and wider spacing.

Key Words : Groundnut, variety, spacing, yield, economics

Groundnut is an important food legume and oil seed world wise and presently grown in about 90 countries in about 25 million hectares under different agro climatic regions. It is mainly grown on large scale in India, China, USA, Senegal, Indonesia, Nigeria, Brazil & Argentina. India is the leading groundnut producing country since it accounts for about 34.5% world groundnut area and about 27.3% production (second to China). It is recognized that the optimal combination of new genotypes proper plant stand is the driving force to increase production, which are necessary to satisfy the demands of an increasing population of the world (Kailas *et al.*, 1997). Hence, the present investigation is aimed to find out the optimum plant population on some improved cultivars of groundnut in Red & Laterite zone of West Bengal.

MATERIALS AND METHODS

The present investigation was conducted at Regional Research Station, Bidhan Chandra Krishi Viswavidyalaya, Jhargram, Paschim Medinipur, West Bengal during the summer season of 2004 and 2005. The soil of the experimental field was sandy loam in texture with organic carbon content 0.045, available nitrogen 166.05 Kgha⁻¹, Phosphorus content 10.95kgha⁻¹ potassium content 87.31 kgha⁻¹ with pH 6.4. The experiment was laid out in split plot design with 3 replications keeping variety in main plots and spacing in sub plot. The treatment comprised 5

varieties viz., V1-TG38B, V2-TAG24, V3-ICGS44, V4- DH101 and V5- ANDG50 and 3 levels of spacing viz., S1-20cmx10cm, S2-30cm x 10cm and S3 45cmx10cm. The recommended dose of N, P₂O₅, and K₂O was 30:60:40 Kgha⁻¹. The pre-emergence application of herbicide pendemethalin @ 1ml lit⁻¹ of water was applied. Seed was treated with Dithene M 45 @ 3gm kg⁻¹ of seed. The crop was sown on 17th and 2nd January during 2004 and 2005 respectively. Gypsum was applied @400 kg ha⁻¹.

RESULTS AND DISCUSSION

Ancillary observations

Early flowering 36-39 days after sowing was observed in variety TAG 24 and ANDG 50. Another varieties the first flowering continued up to 41- 44 DAS (TG 38B, ICGS 44 and DH 101) and in all the varieties 50% flowering occurred within 4-7 days from first flowering. Shelling percentage was found maximum in varieties TG 38B and ICGS 44 although they were statistically at par with the other varieties TAG 24, ANDG 50 and DH 101 during both the years (2004 and 2005). In case of plant population shelling percentage varied significantly and it was found maximum in wider spacing 45 cm x 10 cm (70.8 % and 69.8 % during both the years) followed by 30 cm x 10 cm (69.8 % and 69.4 %) and 20 cm x 10 cm (67.6 % and 67.2 %) Munda *et al.* (1989) opined alike. Hundred kernel weight was found

Table 1 : Effect of spacing on improved cultivars of summer season groundnut (*Arachis hypogaea*) in red & laterite zone of West Bengal

Treatment	Groundnut yield and economics																	
	Pod yield (kg ⁻¹)			Kernel yield (kg ha ⁻¹)			Haulm yield (kg ha ⁻¹)			Gross Return (Rs ha ⁻¹)		Net Return (Rs ha ⁻¹)		Total cost of cultivation (Rs ha ⁻¹)	BCR			
	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean	2004	2005	2004	2005	Mean cost	2004	2005	Mean	
Variety																		
TG38B(V1)	2523	2614	2569	1751	1862	1807	3214	3313	3264	51263	53108	34631	36476	16632	3.08	3.19	3.14	
TAG24(V2)	2717	3150	2934	1849	2209	2029	3389	3843	3616	55187	63961	38555	47329	16632	3.32	3.79	3.56	
ICGS44(V3)	2993	2729	2856	2076	1797	1937	3621	3353	3487	60651	55200	44019	38568	16632	3.64	3.32	3.48	
DH101(V4)	2417	2589	2503	1723	1789	1756	3164	3283	3223	49245	52618	32613	35986	16632	2.96	3.16	3.06	
ANDG50(V5)	2713	2883	2798	1900	1949	1925	3421	3564	3493	55115	58551	38483	41919	16632	3.31	3.52	3.41	
SEm(±)	27.31	31.09	23.91	8.93	10.21	9.34	9.58	7.98	10.25									
CD(P=0.05)	79.47	90.47	69.57	25.98	29.71	27.17	27.87	23.22	29.82									
Spacing(cm)																		
20x10	2661	2770	2716	1799	1882	1841	3512	3610	3561	54098	56302	37466	39670	16632	3.52	3.38	3.45	
30x10	2847	2933	2890	2023	2040	2031	3350	3431	3391	57778	59518	41146	42886	16632	3.47	3.58	3.52	
45x10	2510	2670	2590	1757	1842	1799	3223	3372	3298	51006	54243	34374	37611	16632	3.06	3.26	3.16	
S.Em(±)	31.24	28.96	36.21	10.95	8.96	9.08	36.11	16.52	27.36									
CD(P=0.05)	98.41	91.22	114.07	34.49	28.22	28.60	113.74	52.03	86.18									

Table 2 : Effect of spacing on improved cultivars of summer season groundnut (*Arachis hypogaea*) in red & laterite zone of West Bengal

Treatment	Ancillary observation													
	Days to 1 st flowering		Days to 50% flowering		Shelling (%)		SMK (%)		HKW (g)		Oil (%)		Days to maturity	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
Variety														
TG38B(V1)	41	43	45	49	69	71	72	77	41.8	42.2	49	50	122	124
TAG24(V2)	36	37	40	41	68	70	82	85	40.3	39.7	47.3	47	113	110
ICGS44(V3)	41	44	49	49	71	69	74	72.7	38.7	39.3	49.6	50	125	123
DH101(V4)	40	43	47	47	69	66	81	77	34.2	34.2	49	50	123	126
ANDG50(V5)	37	39	44	45	70	68	80.3	79.3	36.4	36.4	53	52	120	127
SEm(±)					0.31	0.41	0.72	0.83	0.95	0.89	0.64	0.61		
CD(P=0.05)					0.90	1.19	2.09	2.41	2.76	2.59	1.86	1.77		
Spacing(cm)														
20x10	39	41	45	46	67.6	67.2	73.8	74.8	37.6	37.6	49.3	49.5		
30x10	39	41	45	46	69.8	69.4	80	80	38.6	38.8	49.9	50.1		
45x10	39	41	45	46	70.8	69.8	79.8	79.8	38.6	38.6	49.6	49.8		
S.Em(±)					0.41	0.38	0.87	0.93	0.03	0.02	0.01	0.02		
CD(P=0.05)					1.29	1.19	2.74	2.93	0.09	0.06	NS	NS		

maximum in the variety TG 38B (41.8 g and 43.2 g in 2004 and 2005 respectively) and lowest was observed in the variety DH 101 (34.2 g and 34.2 g in 2004 and 2005 respectively). Sasikumar *et al.* (1990) reported the similar result. In case of spacing 100 kernel weight varied significantly but they were statistically at par with each other. The variety TAG 24 exhibited highest SMK % as compared to another varieties and in spacing it was maximum in 30 cm × 10 cm during both the years. The highest oil content was found ANDG 50 and lowest was TAG 24 (47.3 % and 47 % in 2004 and 2005 respectively). All the varieties matured within 110 – 126 days after sowing. No significant oil content was observed due to different plant spacing. Similar result was also reported by Dwivedi *et al.* (1992).

Yield and economics

The highest pod yield was obtained in the variety TAG 24 (2934 kg ha⁻¹) followed by ICGS 44 (2856 kg ha⁻¹), ANDG 50 (2798 kg ha⁻¹), TG 38B (2569 kg ha⁻¹) and DH 101 (2503 kg ha⁻¹). Similarly kernel yield was found maximum in the variety TAG 24 (2029 kg ha⁻¹) which was significantly superior than other varieties ICGS 44, ANDG 50, TG 38B and DH101. Ahmed (1992) reported the similar result. Plant spacing S₂ (30 cm × 10cm) significantly increased both the pod and kernel yield as compared to closer spacing S₁ (20 cm × 10 cm) and wider

spacing (45 cm × 10 cm). The highest haulm yield was found in the variety ICGS 44 which was significantly superior than other varieties. The BCR was highest in variety TAG 24 followed by ANDG 50, ICGS 44, TG 38B and DH 101.

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