

EFFECT OF SOWING DATES ON PERFORMANCE OF GROUNDNUT (*Arachis hypogaea* L.) CULTIVARS IN RABI SEASON UNDER SOUTH GUJARAT CONDITIONS

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ABSTRACT

*A field experiment was conducted on deep black soils of College Farm, Navsari Agricultural University, Navsari during rabi-2005-06 to study the “Effect of sowing dates on performance of groundnut (*Arachis hypogaea* L.) cultivars in rabi season under South Gujarat conditions”. The results revealed that growth parameters, yield attributes, yield and net return were recorded significantly higher when groundnut crop sown at 15th to 25th October as compared to other dates of sowing. Also, groundnut variety GG-2 was found best followed by GG-7 with respect to growth parameters, yield attributes, yield and economics.*

KEY WORDS: *Groundnut, growth parameters, sowing date, yield*

INTRODUCTION

The peanut or groundnut (*Arachis hypogaea* L.), is a crop of the legume or "bean" family (Fabaceae). It is grown in *kharif* as well as in summer seasons and present research is also concentrated on it, but the production in *rabi* season would have a stabilizing influence on price behavior because of the arrivals of the crop in to market during off season. The cultivation of this crop is not economical during *kharif* season due to inadequacy and uncertainty of rainfall coupled with infestation of pest and disease. On the contrary, the cultivation of this crop during summer season is much profitable, but early sowing (last week of January) results in poor emergence, whereas later sowing (after first week of February) faces early onset of monsoon and thereby premature

harvesting of the crop also causes loss in yield and shelling percentage. An alternative planning is, therefore, necessary to reduce irrigation requirement by utilizing residual soil moisture and post-monsoon rain to stabilize the yield. Keeping this in view, the present investigation was framed to study the effect of sowing dates on performance of groundnut (*Arachis hypogaea* L.) cultivars in *rabi* season under South Gujarat conditions.

MATERIALS AND METHODS

A field experiment was conducted at College Farm, Navsari Agricultural University, Navsari during *rabi* – 2005-06 to study the “Effect of sowing dates on performance of groundnut (*Arachis hypogaea* L.) cultivars in *rabi* season under South Gujarat conditions”. The soil of experimental field was clayey

in texture, low in nitrogen (0.05%), medium in phosphorus (31.00 kg/ha) and rich in potash (370.00 kg/ha). Sixteen treatments comprising of four dates of sowing viz., 15th October (D₁), 30th October (D₂), 4th November (D₃) and 14th November (D₄) and four cultivars viz., GG-2 (V₁), GG-5 (V₂), GG-7 (V₃) and TG-26 (V₄) were tried in strip plot design with three replications. The clean and bold seeds were selected and seed treatment of Thirum @ 3gm/1kg seed was given before sowing. Furrows were opened at 30 cm apart then entire quantity of nitrogen and phosphorous were applied as basal. Sowing was done by dibbling of seeds using recommended seed rate of different varieties as per treatments. Two hand weeding were carried out at 20 and 40 DAS. The observations of growth, yield attributes and yield were taken from randomly selected five plants from net plot area and subjected to statistical analysis. The estimation of oil content in kernel was done by using Nuclear Magnetic Resonance (NMR) instrument. Net realization and BCR values were also worked out by considering the prevailing market price of seed and haulm.

RESULTS AND DISCUSSIONS

Effect of date of sowing

Result presented in Table 1 indicated that groundnut sown on 15th October and 25th October produced significantly higher plant height, root nodules per plant and dry matter production per plant than 4th November and 14th November sowing. 15th October and 25th October produced significantly higher pod yield per plant, pod yield (q/ha), test weight and shelling percentage than 4th November and 14th November sowing. This might be due early sowing provide congenial condition for better vegetative growth as compared to delayed sowing. These findings are in accordance with the

results reported by Deka *et al.* (1997). Difference due to different date of sowing was found to be non significant with respect to number of branches per plant, oil content and harvest index. Significantly higher pod yield and haulm yield was achieved under 15th October and 25th October date of sowing, while maximum gross realization, net realization and CBR were recorded under 15th October sowing as compared to rest of the treatments (Table 2). The increase in seed yield under early sowing might be on account of overall improvement in almost all yield attributes under early sowing i.e. 15th October (D₁). These results are in close conformity with the findings of Ghadekar (1989), Bhalerao *et al.* (1993), Deka *et al.* (1997) and Dhadge *et al.* (2008).

Effect of varieties

Data presented in Table 1 indicated that significantly the highest plant height and pod yield per plant was recorded by variety GG-5 and GG-7, respectively. Number of branches per plant and dry matter accumulation per plant was recorded significantly higher by variety GG-2 as compared rest of the varieties except GG-7. Significantly higher number of root nodules per plant and shelling per cent was recorded by variety GG-2 as compared to variety TG-26. Further, it was observed that test weight was recorded significantly higher by variety GG-7 as compared to TG-26. Oil content and harvest index was not affected by varieties. The variation in growth attributes was observed due to genotypic differences of varieties. The results are in line with the findings of Padhi (1994). Maximum pod yield, haulm yield, gross realization, net realization and CBR ratio was recorded under variety GG-2 as compared to other varieties

(Table 2). The higher yield under GG-2 variety might be due to inherent efficiency to utilize more water and nutrients as compared to other varieties. The results are in accordance with the findings of Patel *et al.* (1991), Kaul (1993), and Dhadge *et al.* (2008).

Interaction effect

The interaction effect due to date of sowing and varieties were found non-significant with respect to growth, yield attributes and yield of groundnut (Table 1 and 2).

CONCLUSION

On the basis of experimental results, it can be concluded that higher profitable yield of *rabi* groundnut variety GG-2 can be obtained by sowing at around 15th October.

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Table 1: Effect of date of sowing and varieties of groundnut on growth and yield attributes during *rabi* season

Treatments	Plant Height (cm)	Number of Branches Per Plant	Number of Root Nodules Per Plant	Dry Matter Production Per Plant (g)	Pod Yield Per Plant (g)	Oil Content (%)	Test Weight (g)	Shelling Percent (%)	Harvest Index (%)
Date of Sowing (D)									
D ₁ :15 th October	35.23	7.15	88.16	36.52	18.88	48.86	48.46	73.61	36.01
D ₂ :25 th October	34.80	6.98	85.82	35.87	17.75	48.69	44.13	70.04	36.10
D ₃ :4 th November	28.60	6.89	73.25	29.52	14.53	48.17	39.63	66.31	34.52
D ₄ :14 th November	26.25	6.90	72.67	28.77	12.93	47.56	37.26	63.91	34.40
S.Em. $\pm$	0.86	0.21	1.22	0.83	0.44	0.69	1.42	0.88	0.76
C.D. at 5%	2.99	NS	4.22	2.88	1.52	NS	4.92	3.03	NS
C.V. %	9.58	10.37	5.28	8.81	9.49	4.96	11.62	4.43	7.43
Varieties (V)									
V ₁ :GG-2	32.56	7.58	87.39	37.29	14.57	47.31	35.64	70.49	35.19
V ₂ :GG-5	39.87	6.91	77.84	30.74	17.75	48.77	44.60	69.60	33.38
V ₃ :GG-7	34.20	7.02	84.12	35.46	19.31	49.00	47.65	68.38	36.43
V ₄ :TG-26	18.26	6.42	70.54	27.19	12.46	48.20	41.59	65.39	36.03
S.Em. $\pm$	0.90	0.20	3.07	1.13	0.35	0.88	1.21	0.92	0.68
C.D. at 5%	3.13	0.69	10.64	3.91	1.22	NS	4.19	3.17	NS
C.V. %	10.03	9.86	13.32	11.97	7.60	6.31	9.90	4.63	6.67
Interaction (D x V)									
S. Em. $\pm$	1.70	0.39	2.65	1.66	1.16	1.41	2.22	1.94	1.30
C. D. at 5 %	NS	NS	NS	NS	NS	NS	NS	NS	NS
C.V. %	9.44	9.68	5.74	8.79	12.61	5.06	9.06	4.90	6.39

Table 2: Effect of date of sowing and varieties of groundnut yield and economics

Treatments	Pod Yield (q/ha)	Haulm Yield (q/ha)	Gross Realization (Rs./ha)	Net Reutilization (Rs./ha)	CBR
Date of Sowing (D)					
D ₁ :15 th October	24.25	43.04	47954	38501	1:4.07
D ₂ :25 th October	24.01	42.39	47457	38004	1:4.02
D ₃ :4 th November	19.75	37.51	39301	29848	1:3.16
D ₄ :14 th November	19.03	36.31	37885	28432	1:3.01
S.Em. $\pm$	0.43	0.85	-	-	-
C.D. at 5%	1.45	2.93	-	-	-
C.V. %	6.79	7.37	-	-	-
Varieties (V)					
V ₁ :GG-2	24.22	44.38	48034	38581	1:4.08
V ₂ :GG-5	18.86	37.64	37712	28259	1:2.99
V ₃ :GG-7	23.33	40.72	46066	36613	1:3.87
V ₄ :TG-26	20.63	36.51	40785	31332	1:3.31
S.Em. $\pm$	0.52	0.79	-	-	-
C.D. at 5%	1.81	2.73	-	-	-
C.V. %	8.33	6.85	-	-	-
Interaction (D x V)					
S. Em. $\pm$	0.87	1.61	-	-	-
C. D. at 5 %	NS	NS	-	-	-
C.V. %	6.89	6.99	-	-	-

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