

Effect of sowing time and advance lines on the yield and yield contributing characters of groundnut

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Abstract The experiment was carried out at the Regional Agricultural Research station, Bangladesh Agricultural Research Institute (BARI), Rahmatpur, Barisal during the rabi season of 2007-2008 and 2008-09 with 4 advance lines to find out the optimum sowing time on the yield and yield contributing characters and best advance lines of groundnut. The experiment was conducted in 6m x 4m size plots in a randomized complete block design (RCBD) with three replication. There were four sowing time and four advance lines viz., December-01, December-10, December-20, December-30 and ICGV 96342, ICGV 96390, ICGV 90228, SL-1. Among the treatments the highest pod yield (2366kg/ha) was found at first sowing time of December-01. The highest pod yield (2380kg/ha) was found in SL-1 of groundnut advance line. The results also showed that the groundnut advance line of groundnut coupled with December-01 sowing gave the highest pod yield (2380kg/ha).

Key words: Sowing time, advance line, yield, Yield Contributing, Characters, groundnut.

Introduction

Bangladesh is principally an agricultural country and produces good number of oilseed crops like mustard, sesame, groundnut, linseed, niger, safflower, sunflower, soybean, castor, etc. The first three are considered as the major oil crops. Groundnut (*Arachis hypogaea*) is one of the important oilseed crops. So far, a number of high yielding varieties have been developed. Research programme is going on to develop more varieties with high yield potential and diseases resistant varieties. Recently, a few number of groundnut lines have been collected from ICRISAT. Some of them are performing good under Bangladesh condition.

Groundnut (*Arachis hypogaea* L.) is the third most important legume oilseed crop in Bangladesh (Anon, 2008.) which is grown in 27073 ha with a production of 34240 metric tons in 2002-2003 (BBS, 2005). Its seed contain 48-50% oil and 22-29% protein. It is used as edible oil, to make cake, biscuit and other confectionary purpose. Recently, the area of groundnut is being decreased due to the competition with rabi crops like wheat, potato, boro rice and mustard (Biswas *et al.* 1997). Moreover, most of the char areas of Bangladesh become inundated in the kharif season which causes decline of groundnut area. In kharif season, only some high lands are used for groundnut cultivation.

But yield of groundnut is very low due to poor management practices under field conditions, such as improper practices can increase the productivity of groundnut up to a considerable extent. There is bright prospect for expansion of groundnut cultivation because it can be grown in both rabi and kharif seasons. Each crop genotypes needs certain time for normal growth and development. The present study was therefore, under taken to find out the effect of sowing time and advance lines on the yield of groundnut.

Materials and Methods

The experiment was conducted in the field of the Regional Agricultural Research station, Bangladesh Agricultural Research Institute (BARI), Rahmatpur, Barisal during rabi seasons of 2007-2008 and 2008-2009. It was laid out in a randomized complete block design (RCBD) with three replications. The unit plot size was 6m x 4m. The

treatment of the experiment were four advance lines of groundnut viz., ICGV 96342, ICGV 96390, ICGV 90228, SL-1 and four date of sowing groundnut viz., D₁ = December-01, D₂ = December-10, D₃ = December-20, D₄ = December-30. The seeds were sown at the spacing maintained for groundnut was 30 cm row to row and 15 cm seed to seed distances. Fertilizers were applied at 25-160-85-300-5-10 kg/ha of urea, triple super phosphate, muriate of potash, gypsum, zinc sulphate and borax respectively, as recommended for Bangladesh (Anon, 2004). One half amount of urea and full dose of all other fertilizers were incorporated into the soil at the time of final land preparation. The remaining urea was top dressed in two equal installments at 35 and 65 days after sowing. During land preparation, cowdung was applied at 10 ton/ha. Intercultural operations, such as irrigation was given twice, weeding, mulching and earthing up were done as and when necessary as per recommendation of Mondall and Wahhab (2000). Insect and disease control were done as per requirement. At maturity 10 randomly selected plants were uprooted for data collection. Data were collected days to maturity, plant height, no of pods/plant, no of seeds/pod, TGW and plot yield. The yield and yield contributing characters were recorded. Recorded data were analyzed in the computer package programme MSTAT-C for Randomized Complete Block Design (RCBD) and mean value were separated by Duncan's Multiple Range Test (DMRT) (Gomez and Gomez, 1984).

Results and Discussion

Effect of sowing time: Table 1 shows that no. of mature pod/plant, 100-seed wt. (gm) and pod yield were statistically significant. These characters showed better performance in the earlier dates of sowing. Plant characters like days to maturity and plant height did not vary significantly. The maximum no. of mature pod/plant (21.0) was obtained from December-01 sowing. The lowest no. of mature pod/plant (17.7) was recorded from mature pod/plant December-01 sowing. In case of 100-seed wt. (gm), the maximum of 100-seed wt. (gm) (55.5) was obtained from December-01 sowing. The lowest of 100-seed wt. (gm) (49.7) was recorded from December-30 sowing. The maximum pod yield (2366 kg/ha) was

obtained from December-01 sowing which was followed by December-10 sowing. It might be due to higher no. of mature pod/plant and 100-seed wt. (gm) in this treatment. The lowest pod yield (1877 kg/ha) was recorded from

December-30 sowing (Table 1). Results show that reasonable good seed yield could be obtained up to December-01 sowing but yield was considerably reduced from December-30.

Table 1. Effect of date of sowing on the yield and yield contributing characters of groundnut

Date of sowing	Days to maturity	Plant height	No. of mature pod/plant	100-seedwt.(gm)	Pod yield (kg/ha)
December-01	164a	37.5a	21.0a	55.5a	2366a
December-10	163a	38.7a	19.9a	52.6b	2212a
December-20	163a	37.5a	18.8a	50.7c	2058b
December-30	162a	38.8a	17.7b	49.7c	1877c
CV (%)	NS	NS	5.75	2.68	11.95

Mean followed by the same letters in a column do not differ significantly at 5% level by DMRT

Table 2. Effect of different genotypes on the yield and yield contributing characters of advance line of groundnut

Genotypes/advance lines	Days to maturity	Plant height (cm)	Mature pods/ plant	100-seed wt. (gm)	Pod yield (kg/ha)
ICGV 96342	161.0a	37.8a	20.7b	52.5b	1914c
ICGV 96390	162.0a	38.8a	22.3a	54.7a	2315a
ICGV 90228	163.0a	37.6a	21.6a	53.2b	2112b
SL-1	162.0a	38.3a	23.3a	55.7a	2380a
CV (0.05)	NS	NS	25.09	2.64	13.58

Mean followed by the same letters in a column do not differ significantly at 5% level by DMRT

Table 3. Interaction effect of date of sowing and advance lines of groundnut

Advance line x sowing date	Days to maturity	Plant height(cm)	No. of mature pods/plant	100-seed wt.(gm)	Pod yield (kg/ha)
ICGV 96342					
December-01	165.0a	37.7a	20.7a	53.4a	1918a
December-10	165.0a	37.9a	20.2a	53.1a	1905a
December-20	164.0a	38.4a	19.0b	51.5b	1845b
December-30	162.0a	38.8a	18.4c	49.8c	1717c
ICGV 96390					
December-01	166.0a	38.4a	23.3a	54.8a	2326a
December-10	165.0a	38.7a	23.0a	54.7a	2306a
December-20	165.0a	38.8a	20.8b	52.5b	2208b
December-30	164.0a	38.9a	19.7c	51.0c	2020c
ICGV 9228					
December-01	166.0a	37.5a	22.5a	53.8a	2122a
December-10	166.0a	37.6a	22.0a	53.2a	2112a
December-20	165.0a	38.5a	20.7b	51.5b	2054b
December-30	163.0a	38.5a	18.6c	50.2c	1985c
SL-1					
December-01	167.3a	38.7a	24.3a	55.9a	2380 a
December-10	167.4a	38.8a	24.1a	55.1a	2317a
December-20	166.3a	38.8a	22.9b	53.2b	2226b
December-30	165.0a	38.9a	22.3b	51.1c	2080 c

Mean followed by the same letters in a column do not differ significantly at 5% level by DMRT

Effect of genotypes: Table 2 shows that all the yield contributing characters and yields of different genotypes were statistically significant except days to maturity and plant height. The maximum no. of mature pods/ plant (23.3) was received from the advance line SL-1. The lowest no. of mature pods/ plant (22.7) was obtained from the advance line ICGV 96342. The highest 100-seed wt.(gm) (55.7) was obtained from the advance line SL-1 which was

followed by ICGV 96390. The lowest 100-seed wt.(gm) (52.5) was obtained from the advance line ICGV 96342. The maximum pod yield (2380 kg/ha) was obtained from the advance line SL-1 which was followed by ICGV 96390. It might be due to higher no. of mature pods/ plant and 100-seed wt.(gm). The minimum pod yield (1914 kg/ha) was obtained from the advance line ICGV 96342.

Interaction effect of date of sowing and advanced line of groundnut: Interaction effect of sowing date and advanced line of groundnut showed significant influence on no. of mature pods/plant, 100-seed wt.(gm) and pod yield but days to maturity and plant height were not found significant due to interaction affect of date of sowing and groundnut.advance lines (Table 3). Among the advance lines, the maximum no. of mature pods/plant (24.3) was found in the advance line SL-1 with December-01 sowing and lowest in ICGV 96342 (18.4) with December-30 sowing. The highest 100-seed wt.(gm) (55.9) was obtained from advance line SL-1 which was followed by ICGV 96390(54.8). The lowest 100-seed wt.(gm) (49.8) was obtained from the advance lin ICGV 96342 with December-30 sowing.The maximum pod yield (2380 kg/ha) was obtained from advance line SL-1 with December-01 sowing followed by the advance line ICGV 96390 (2326 kg/ha) with same date of sowing. It might be due to higher no. of mature pods/plant and 100-seed wt.(gm). The lowest pod yield (1717 kg/ha) was obtained from the advance line ICGV 96342 with December-30 sowing. December-30 also showed reasonable good yield but after that yield was reduced considerably incase of all the genotypes (Table-3).

From the result of the experiment, it may be concluded that advance line SL-1, ICGV-96390 and ICGV-90228 were found better yielder when sown in 01 December but these later advance line can also be grown up to 10 December to get reasonable better yield.

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