

## EFFECT OF DIFFERENT SEEDING DATES ON MORPHOLOGY AND YIELD OF DIFFERENT COTTON GENOTYPES

M. Aziz<sup>1</sup>, J. U. Ahmed<sup>2</sup>, M. G. G. Mortuza<sup>3</sup>, M. T. Rahman<sup>4</sup> and M. F. Uddin<sup>5</sup>

### ABSTRACT

The experiment was conducted at Cotton Research, Training and Seed Multiplication Farm, Sreepur, Gazipur during May 2006 to January 2007. The experiment was carried out to determine the appropriate sowing time of cotton. Twenty two genotypes of cotton were tested. The genotypes were planted in three different sowing dates viz. May 15, June 15 and July 15. Among 22 genotypes five genotypes (NAM-77, C-2602, BC-0342, BC-0406 and CB-10) were found to be short durated in respect of early flowering (57, 57.67, 57.74, 58.87 and 57.29 days in June sowing respectively) and boll splitting time (94.32, 87.19, 100.56, 102.67 and 95.56 days in June sowing) than the cultivated genotype CB-9 (68.33 and 130.41 days for first flowering and first boll splitting respectively).

**Key words:** Cotton genotypes, Seeding date, Cotton yield

### INTRODUCTION

Cotton (*Gossypium hirsutum* L.) is an important cash crop. It is considered as a source of direct income to farmers and labourers because of local textile industry. There is vast gap between the potential and national average yield. Yield of seed cotton is a result of many contributing factors, among those the time of sowing is an important one. Late sowing beyond recommended (July sowing) time lowers the seed cotton yield significantly. Itnal *et al.* (1993) reported that seed cotton yield was decreased by delaying sowing after July. They further observed that higher seed cotton yield due to early sowing was mainly attributed to higher number of open bolls and seed cotton weight. Hosny and Shahine (1995) concluded that delayed sowing increased the period from sowing to seedling emergence, 1<sup>st</sup> square, 1<sup>st</sup> flower, 1<sup>st</sup> open boll and full harvest, while number of open bolls per plant survival decreased. Shekara *et al.* (1988) reported that mean seed cotton yield was 1871 kg ha<sup>-1</sup> from the earliest sowing date, 1655 kg ha<sup>-1</sup> when sown in the first fortnight of June and <600 kg ha<sup>-1</sup> with later sowing dates. When cotton is planted after the break of monsoon, it suffers from moisture stress at later stage when bolls are being formed and developed. Cotton in Bangladesh is grown in July-August when maximum rainfall occurs and is not strictly suitable for exploiting maximum potentiality.

Sowing time plays an important role to realize maximum seed cotton yield. Yield of cotton can be sufficiently increased if we know the optimum time for sowing. Keeping in view all these, the experiment was conducted to find out the appropriate sowing time and short duration cotton genotypes under rainfed conditions at Sreepur, Bangladesh. With the view in mind, the study was undertaken to identify short duration cotton genotypes and their yield at different seeding dates, to study the morphological differences at different seeding time.

### MATERIALS AND METHODS

A field experiment was carried out at the Research field of Cotton Research, Training and Seed Multiplication Farm, Sreepur, Gazipur during kharif season (15<sup>th</sup> May, 15<sup>th</sup> June and 15<sup>th</sup> July) of 2006 using cotton genotypes collected from Cotton Research Centre, Mahigonj, Rangpur as the test crop to find out the morphological response of cotton genotypes under varied planting time. The experimental site was situated at 24.09°N latitude and 90.26°E longitude having an elevation of 8.4 meter from the

<sup>1</sup>DPD, Disaster and Climate risk management in agriculture project, DAE, Khamarbari, Farmgate, Dhaka, <sup>2</sup> Professor, Department of Crop Botany, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Salna, Gazipur-1706. <sup>3</sup> & <sup>4</sup> Cotton Development Officer, <sup>5</sup> Deputy Director (HQ), Cotton Development Board, Khamarbari, Dhaka-1215

sea level (Anonymous, 1989). The experiment was laid out in Randomized Complete Block Design (RCBD) with three replications having two factors viz. genotypes and sowing date. The unit plot size was 4.5 m × 5.4 m maintaining line to line 90 cm and plant to plant 45 cm which were separated by 1.0 m. The experimental blocks were separated by 1.0 m. The treatments included— twenty two genotypes and three sowing time. Seeds were sown in three dates i.e S<sub>1</sub> = First sowing - 15 May, 2006, S<sub>2</sub> = Second sowing - 15 June, 2006 and S<sub>3</sub> = Third sowing - 15 July, 2006.

Seeds were defuzzed and treated with Gaucho at the rate of 5 g kg<sup>-1</sup> seed and were sown 2-3 seeds hill<sup>-1</sup> (8-10 kg ha<sup>-1</sup>) on 15 May, 15 June and 15 July of 2006 in furrows maintaining the row to row spacing of 90 cm and plant to plant spacing 45 cm. Seeds were placed in pit to a depth of 4-5 cm and then covered with loose soil. The seedlings of different genotypes emerged between 6-8 days after sowing. After full maturation of bolls, seed cottons were collected by hand picking and they were dried under sun light. Total three hand pickings were done. After drying of seed cotton, lint and seed of cotton were separated by ginning. Cotton lint and seeds were weighed and lint was examined in the Cotton Development Board, Khamarbari, Dhaka to analyze fibre quality.

The recorded data on various parameters of the crop were statistically analyzed using RCBD design and levels of significance of genotypes within a seeding date were tested using LSD test. t-test was used to compare the level of significance between the two consecutive dates.

## RESULTS AND DISCUSSION

### Plant height

Plant height was significantly influenced by sowing time (Table 1). The highest plant (141.30 cm) was found at July 15 sowing time which was statistically superior to the rest of the sowing time of cotton. Sowing time July 15 was followed by June 15 of cotton. The shortest plant (56.37 cm) was noted from July 15 sowing. With respect to plant height, the maximum height of 141.30 cm per plant was recorded

**Table 1. Plant height of cotton genotypes at different seeding time**

Genotypes	Plant height (cm)			Difference		Relative to July	
	May sowing	June sowing	July sowing	July and May sowing	July and June sowing	May sowing	June sowing
BC-025	102.37	101.22	100.29	-2.09*	-0.94NS	1.02	1.01
BC-088	109.96	108.89	108.04	-1.92**	-0.85NS	1.02	1.01
BC-044	109.08	109.08	108.27	-0.80NS	-0.81NS	1.01	1.01
BC-051	89.79	99.08	98.39	8.60**	-0.69NS	0.91	1.01
BC-063	120.04	121.19	120.99	0.95NS	-0.20NS	0.99	1.00
BC-040	116.39	117.33	116.45	0.05NS	-0.88**	1.00	1.01
BC-0116	107.08	107.85	107.85	0.78NS	0.00NS	0.99	1.00
BC-0165	118.01	119.60	119.41	1.40**	-0.18NS	0.99	1.00
BC-0188	107.96	109.49	109.48	1.52*	-0.01NS	0.99	1.00
BC-0197	99.45	99.68	98.90	-0.55NS	-0.79NS	1.01	1.01
BC-0252	102.04	103.22	102.92	0.88**	-0.30NS	0.99	1.00
BC-0294	115.01	116.97	116.89	1.88**	-0.08NS	0.98	1.00
BC-0342	128.29	129.56	140.31	12.02**	10.76**	0.91	0.92
BC-0405	129.04	130.30	129.87	0.83*	-0.44NS	0.99	1.00
BC-0406	119.00	118.16	139.21	20.21NS	21.05NS	0.85	0.85
SR-01	113.04	115.86	115.30	2.26**	2.57NS	0.98	1.00
SR-05	99.96	99.30	98.92	-1.05**	-0.38NS	1.01	1.00
CB-8	59.55	58.59	56.37	-3.18**	-2.22**	1.06	1.04
CB-9	140.94	140.34	141.30	0.36NS	0.96*	1.00	0.99
CB-10	110.04	110.09	119.21	9.17**	9.12**	0.92	0.92
NAM-77	120.12	123.52	129.60	9.49**	6.08**	0.93	0.95
C-2602	127.17	125.85	135.89	8.72**	10.04**	0.94	0.93
LSD (0.05)	7.05	10.52	10.68				
CV (%)	4.85	5.70	5.67				

\* indicates significant at 5% level of significance and \*\* indicates significant at 1% level of significance by t-test

with the genotype CB-9 at the harvest of cotton. The lowest plant height (56.37 cm) was recorded in CB-8 genotype of cotton.

### Sympodial branchial branch

Sympodial branchial branch is generally called fruiting branches. Fruiting branches develop in succession from the first fruiting branch and upward. June 15 sowing time significantly produced the maximum sympodial branch (20.95) than other times (Table 2). Sowing on May 15 and July 15 produced the less sympodial

**Table 2. Number of Sympodial branch in cotton genotypes at different seeding time**

Genotypes	Sympodial branch			Difference		Relative to July	
	May sowing	June sowing	July sowing	July and May sowing	July and June sowing	May sowing	June sowing
BC-025	16.63	18.08	16.74	0.11NS	-1.34*	0.99	1.08
BC-088	18.00	18.84	18.81	0.81NS	-0.03NS	0.96	1.00
BC-044	17.08	17.81	18.53	1.45**	0.71**	0.92	0.96
BC-051	18.12	19.30	18.65	0.54**	-0.64**	0.97	1.03
BC-063	18.44	20.04	19.81	1.37NS	-0.22NS	0.93	1.01
BC-040	19.04	20.11	19.68	0.64NS	-0.43NS	0.97	1.02
BC-0116	18.26	20.95	19.98	1.72**	-0.97*	0.91	1.05
BC-0165	16.27	18.67	17.74	1.47*	-0.93NS	0.92	1.05
BC-0188	17.01	18.36	19.74	2.73**	1.39*	0.86	0.93
BC-0197	15.89	17.18	16.87	0.98**	-0.31NS	0.94	1.02
BC-0252	17.62	18.81	18.87	1.25*	0.06NS	0.93	1.00
BC-0294	15.96	16.98	17.07	1.11**	0.09NS	0.93	0.99
BC-0342	17.04	16.65	18.28	1.23*	1.63**	0.93	0.91
BC-0405	17.92	18.91	18.45	0.53NS	-0.47NS	0.97	1.03
BC-0406	16.51	18.01	20.52	4.02**	2.51**	0.80	0.88
SR-01	15.00	16.08	16.82	1.82**	0.74*	0.89	0.96
SR-05	14.22	15.37	15.44	1.22*	0.07NS	0.92	1.00
CB-8	13.86	14.01	13.97	0.11NS	-0.04NS	0.99	1.00
CB-9	16.82	16.82	16.53	-0.30NS	-0.29NS	1.02	1.02
CB-10	17.26	18.22	15.79	-1.47*	-2.44**	1.09	1.15
NAM-77	20.14	20.00	16.24	-3.90**	-3.76**	1.24	1.23
C-2602	13.19	14.29	12.56	-0.63NS	-1.73*	1.05	1.14
LSD (0.05)	1.24	1.69	1.36				
CV (%)	5.59	5.76	4.70				

\* indicates significant at 5% level of significance and \*\* indicates significant at 1% level of significance by t-test

branch than June 15 sowing of cotton. The higher sympodial branch in June 15 might be due to plant received comparatively favourable environment and due to the development of less number of monopods. The lowest sympodial branch (12.56) was observed in July 15 sowing time of cotton.

### Single boll weight

June 15 sowing time significantly produced the maximum single boll weight (5.50 g) than other sowing times (Table 3). Sowing on June 15 and July 15 produced the similar weight of single boll weight but superior to May 15 sowing time. June 15 and July 15 were followed May 15 sowing time. The higher single boll weight in June 15 might be due to plant received comparatively favourable environment. The single boll weight per plant ranged from 3.04 g to 5.50 g. The maximum single boll weight (5.5 g plant<sup>-1</sup>) was recorded by CB-10 genotype which was statistically similar to all genotypes except CB-8, BC-0188 and BC-0165 genotypes.

### Number of bolls plant<sup>-1</sup>

Different sowing times significantly influenced on number of bolls per plant of cotton (Table 4). The maximum number of bolls per plant (25.56 bolls plant<sup>-1</sup>) was recorded in June 15 sowing time which was statistically superior to the rest of the sowing times of cotton. Sowing time June 15 was followed by July 15. Noticeable variation in the number of bolls per plant was found in the different genotypes of cotton. Number of bolls per plant differed significantly by genotypes. Maximum number of bolls (25.56

**Table 3. Single boll weight in cotton genotypes at different seeding time**

Genotypes	Single Boll Weight (g)			Difference		Relative to July	
	May sowing	June sowing	July sowing	July and May sowing	July and June sowing	May sowing	June sowing
BC-025	3.90	4.44	4.48	0.59**	0.04NS	0.87	0.99
BC-088	4.01	4.57	4.40	0.39**	-0.17**	0.91	1.04
BC-044	3.53	4.44	4.01	0.49**	-0.43NS	0.88	1.11
BC-051	4.04	4.49	4.31	0.27*	-0.18**	0.94	1.04
BC-063	4.07	4.37	4.01	-0.06NS	-0.36*	1.01	1.09
BC-040	3.83	4.39	4.17	0.34*	-0.22NS	0.92	1.05
BC-0116	3.51	4.19	4.33	0.82**	0.14NS	0.81	0.97
BC-0165	3.20	3.91	3.91	0.71**	0.00NS	0.82	1.00
BC-0188	3.04	3.54	3.92	0.88**	0.38NS	0.78	0.90
BC-0197	3.75	4.39	4.39	0.63*	-0.01NS	0.86	1.00
BC-0252	3.50	4.31	4.13	0.63**	-0.18NS	0.85	1.04
BC-0294	3.75	4.04	4.04	0.29NS	0.00NS	0.93	1.00
BC-0342	3.75	4.23	4.42	0.67*	0.19NS	0.85	0.96
BC-0405	4.00	4.50	4.39	0.39**	-0.11*	0.91	1.02
BC-0406	3.63	4.08	3.86	0.24NS	-0.22NS	0.94	1.06
SR-01	3.83	4.67	4.51	0.68**	-0.16NS	0.85	1.04
SR-05	3.58	4.58	4.43	0.85**	-0.15*	0.81	1.03
CB-8	3.47	4.15	3.13	-0.34*	-1.02**	1.11	1.33
CB-9	4.47	5.01	5.07	0.60**	0.06NS	0.88	0.99
CB-10	4.90	5.50	4.00	-0.90NS	-1.50NS	1.22	1.37
NAM-77	3.08	4.73	5.00	1.92**	0.26NS	0.62	0.75
C-2602	3.96	4.08	3.68	-0.29NS	-0.40NS	1.08	1.22
LSD (0.05)	0.368	0.817	0.72				
CV (%)	5.95	11.38	10.29				

\* indicates significant at 5% level of significance and \*\* indicates significant at 1% level of significance by t-test

**Table 4. Boll number per plant in cotton genotypes at different seeding time**

Genotypes	Boll Number per Plant			Difference		Relative to July	
	May sowing	June sowing	July sowing	July and May sowing	July and June sowing	May sowing	June sowing
BC-025	17.37	21.97	20.33	2.96*	-1.63NS	0.85	1.08
BC-088	16.63	19.88	18.25	1.62*	-1.63NS	0.91	1.09
BC-044	18.96	21.56	21.49	2.53*	-0.06NS	0.88	1.00
BC-051	18.04	21.74	21.03	2.99**	-0.71NS	0.86	1.03
BC-063	17.10	19.82	17.84	0.74NS	-1.98**	0.96	1.11
BC-040	18.08	21.63	21.29	3.21**	-0.34NS	0.85	1.02
BC-0116	19.59	21.37	18.29	-1.30*	-3.08*	1.07	1.17
BC-0165	19.04	22.89	20.85	1.81**	-2.04**	0.91	1.10
BC-0188	20.05	23.04	21.67	1.62*	-1.37NS	0.93	1.06
BC-0197	19.10	23.16	20.94	1.84**	-2.22*	0.91	1.11
BC-0252	18.29	21.27	19.60	1.31NS	-1.67**	0.93	1.09
BC-0294	18.93	23.89	22.33	3.41*	-1.56NS	0.85	1.07
BC-0342	19.93	22.41	21.78	1.85NS	-0.63NS	0.92	1.03
BC-0405	21.26	23.93	22.03	0.77NS	-1.89**	0.96	1.09
BC-0406	17.45	20.63	21.17	3.72NS	0.54NS	0.82	0.97
SR-01	21.04	25.56	23.96	2.92*	-1.59*	0.88	1.07
SR-05	14.53	16.29	13.28	-1.24*	-3.01*	1.09	1.23
CB-8	13.10	16.33	15.44	2.34*	-0.89NS	0.85	1.06
CB-9	15.82	16.30	20.01	4.19NS	3.71**	0.79	0.81
CB-10	17.00	18.24	18.19	1.19*	-0.05NS	0.93	1.00
NAM-77	14.85	16.14	16.00	1.15*	-0.14NS	0.93	1.00
C-2602	10.32	10.71	10.56	0.24NS	-0.15NS	0.98	1.01
LSD (0.05)	2.05	1.52	1.84				
CV (%)	7.09	4.47	5.77				

\* indicates significant at 5% level of significance and \*\* indicates significant at 1% level of significance by t-test

bolts plant<sup>-1</sup>) was recorded in SR-01 genotypes which was statistically superior to the rest of the genotypes of cotton. The minimum number of bolls (10.32 bolls plant<sup>-1</sup>) was noted in the genotype C-2602.

#### Days to first flowering

Days required to first flowering varied significantly due to time of sowing (Table 5). June 15 sowing date required maximum period (68.33 days) among the sowing time which was statistically superior to the rest of the sowing time of cotton. June 15 required minimum period (55.89 days) which was statistically lower than May 15 and July 15. It was observed that June 15 sowing led to lower days required to first flowering. The genotypes significantly varied in recording the days required to first flowering of cotton (Table 5). Genotype CB-9 required significantly longer time (68.33 days) compared to other genotypes and it was statistically superior to the rest of the genotypes under studied. Genotype BC-0165 required minimum period (55.89 days) to first flowering of cotton followed by NAM-77, CB-10 and BC-0342.

**Table 5. Days to First Flowering in cotton genotypes at different seeding time**

Genotypes	Days to first flowering			Difference		Relative to July	
	May sowing	June sowing	July sowing	July and May sowing	July and June sowing	May sowing	June sowing
BC-025	66.58	64.56	64.08	-2.50 NS	-0.48NS	1.04	1.01
BC-088	61.78	60.78	61.22	-0.55 NS	0.45NS	1.01	0.99
BC-044	63.56	63.00	62.90	-0.65 NS	-0.10NS	1.01	1.00
BC-051	64.18	64.93	64.11	-0.07 NS	-0.82*	1.00	1.01
BC-063	61.78	62.44	63.19	1.41*	0.74NS	0.98	0.99
BC-040	66.37	65.89	64.78	-1.60*	-1.11NS	1.02	1.02
BC-0116	64.15	65.41	65.33	1.18**	-0.08NS	0.98	1.00
BC-0165	59.11	55.89	56.41	-2.70*	0.52NS	1.05	0.99
BC-0188	60.89	62.11	61.97	1.08**	-0.14NS	0.98	1.00
BC-0197	62.44	61.93	61.85	-0.59NS	-0.07NS	1.01	1.00
BC-0252	67.63	65.66	65.89	-1.74*	0.23NS	1.03	1.00
BC-0294	61.07	59.48	61.22	0.15NS	1.74NS	1.00	0.97
BC-0342	60.46	57.74	58.22	-2.24NS	0.48*	1.04	0.99
BC-0405	61.22	58.56	59.11	-2.11**	0.55NS	1.04	0.99
BC-0406	61.41	58.87	60.30	-1.11NS	1.43*	1.02	0.98
SR-01	67.89	65.11	64.52	-3.37*	-0.59NS	1.05	1.01
SR-05	61.30	58.56	61.22	-0.08NS	2.67*	1.00	0.96
CB-8	58.78	58.33	59.22	0.45NS	0.89NS	0.99	0.98
CB-9	67.00	68.33	67.89	0.89NS	-0.44NS	0.99	1.01
CB-10	57.33	57.29	57.96	0.63NS	0.68*	0.99	0.99
NAM-77	58.33	57.00	57.96	-0.37NS	0.96**	1.01	0.98
C-2602	57.33	57.00	58.00	0.67NS	1.00*	0.99	0.98
LSD (0.05)	3.24	5.92	3.63				
CV (%)	4.92	6.84	4.58				

\* indicates significant at 5% level of significance and \*\* indicates significant at 1% level of significance by t-test

#### Days to first boll splitting

Sowing time had a significant influence on the days to first boll splitting (Table 6). July 15 sown plants required significantly longer time (140.74 days) compared to May 15 and June 15 sowing time. Craig and Robert (2005) found that early maturing genotypes possessed the shorter flowering time while the longer maturing genotypes possessed the longest flowering time. The cotton genotypes showed a significant variation for the days to first boll splitting (Table 6). Genotype BC-044 required significantly maximum time (140.74 days) compared to other genotypes and it was statistically similar to BC-025 but superior to the rest of the genotypes. sowing time produced the highest seed cotton yield (2.95 t ha<sup>-1</sup>). The effect of this sowing time was statistically superior to the rest of the sowing time under study. The higher seed cotton yield in June 15 might be due to plant received comparatively favourable environment. The yield of cotton varied greatly for different genotypes of cotton (Table 7).

#### Yield

There was a significant effect of different sowing time in recording seed cotton yield (Table 7). June 15

**Table 6. Days to first boll splitting in cotton genotypes at different seeding time**

Genotypes	Days to first boll splitting			Difference		Relative to July	
	May sowing	June sowing	July sowing	July and May sowing	July and June sowing	May sowing	June sowing
BC-025	140.19	138.55	139.30	-0.89*	0.74**	1.01	0.99
BC-088	135.48	132.45	134.22	-1.26**	1.78*	1.01	0.99
BC-044	140.60	140.04	140.74	0.14NS	0.70NS	1.00	1.00
BC-051	137.89	137.41	138.33	0.45NS	0.93NS	1.00	0.99
BC-063	137.56	136.07	138.11	0.56NS	2.04*	1.00	0.99
BC-040	138.48	138.71	139.07	0.59NS	0.37NS	1.00	1.00
BC-0116	135.22	136.23	137.19	1.97NS	0.96NS	0.99	0.99
BC-0165	120.04	115.08	117.07	-2.97**	2.00NS	1.03	0.98
BC-0188	133.85	134.29	134.63	0.78NS	0.34NS	0.99	1.00
BC-0197	128.07	126.50	129.00	0.93NS	2.50*	0.99	0.98
BC-0252	137.30	136.30	137.60	0.30NS	1.30NS	1.00	0.99
BC-0294	117.63	116.52	117.19	-0.44NS	0.67NS	1.00	0.99
BC-0342	105.19	100.56	102.74	-2.45*	2.18*	1.02	0.98
BC-0405	114.41	112.30	112.96	-1.45*	0.66NS	1.01	0.99
BC-0406	102.74	102.67	103.08	0.34NS	0.41*	0.99	0.99
SR-01	130.97	130.74	131.41	0.44NS	0.67NS	1.00	0.99
SR-05	128.85	128.89	130.00	1.15NS	1.11NS	0.99	0.99
CB-8	119.93	120.93	120.63	0.70NS	-0.30NS	0.99	1.00
CB-9	129.23	130.41	130.67	1.44*	0.26NS	0.99	1.00
CB-10	95.67	95.56	92.33	-3.33*	-3.22*	1.04	1.03
NAM-77	94.33	94.32	97.63	3.30NS	3.31**	0.97	0.97
C-2602	89.00	87.19	89.22	0.22NS	2.04*	1.00	0.98
LSD (0.05)	9.36	14.15	14.40				
CV (%)	6.16	7.02	7.13				

\* indicates significant at 5% level of significance and \*\* indicates significant at 1% level of significance by t-test

**Table 7. Yield of cotton genotypes at different seeding time**

Genotypes	Yield (t ha <sup>-1</sup> )			Difference		Relative to July	
	May sowing	June sowing	July sowing	July and May sowing	July and June sowing	May sowing	June sowing
BC-025	1.67	2.41	2.25	0.58*	-0.16NS	0.74	1.07
BC-088	1.65	2.24	1.98	0.34**	-0.26*	0.83	1.13
BC-044	1.65	2.37	2.13	0.48*	-0.24NS	0.78	1.11
BC-051	1.80	2.41	2.24	0.44**	-0.17NS	0.80	1.08
BC-063	1.72	2.14	1.77	0.05NS	-0.37**	0.97	1.21
BC-040	1.71	2.34	2.19	0.48**	-0.15*	0.78	1.07
BC-0116	1.70	2.21	1.96	0.26*	-0.25*	0.87	1.13
BC-0165	1.50	2.21	2.01	0.51**	-0.20NS	0.75	1.10
BC-0188	1.51	2.01	2.10	0.59**	0.08NS	0.72	0.96
BC-0197	1.77	2.51	2.27	0.50**	-0.24*	0.78	1.11
BC-0252	1.58	2.26	2.00	0.42*	-0.26*	0.79	1.13
BC-0294	1.75	2.38	2.23	0.48*	-0.15NS	0.79	1.07
BC-0342	1.85	2.34	2.38	0.53*	0.04NS	0.78	0.98
BC-0405	2.10	2.66	2.39	0.29**	-0.27**	0.88	1.11
BC-0406	1.86	2.08	2.02	0.16NS	-0.06NS	0.92	1.03
SR-01	1.99	2.95	2.67	0.68**	-0.28*	0.75	1.10
SR-05	1.29	1.84	1.45	0.17*	-0.39*	0.88	1.27
CB-8	1.12	1.67	1.19	0.07**	-0.48**	0.94	1.40
CB-9	1.74	2.02	2.50	0.76*	0.49**	0.70	0.81
CB-10	1.96	1.92	1.80	-0.16NS	-0.12NS	1.09	1.07
NAM-77	1.13	1.64	1.97	0.85**	0.34NS	0.57	0.83
C-2602	1.01	1.05	0.96	-0.05NS	-0.09NS	1.05	1.09
LSD (0.05)	0.23	0.35	0.36				
CV (%)	7.53	9.56	10.88				

\* indicates significant at 5% level of significance and \*\* indicates significant at 1% level of significance by t-test

The maximum cotton yield (2.95 t ha<sup>-1</sup>) was produced by SR-01 genotype which was statistically superior to the rest of the genotypes. The lowest yield of cotton (0.96 t ha<sup>-1</sup>) was obtained by genotype C-2602 of the crop. Bhatt (1996) found that the water requirements of cotton were much greater during peak flowering and bolling periods than in the early stages of growth of cotton.

#### Total crop duration

July and May sowing showed the longest plant duration of different cotton genotypes under the study. Total crop duration was recorded as maximum of 218 days with the genotype BC-025 in May 15 sowing. The shortest crop duration was recorded as minimum of 145 days with the genotype C-2602 in June sowing and was followed by NAM-77, CB-10, BC-0342 and BC-0406 (153, 154, 160 and 161 days respectively).

**Table 8. Total crop duration of twenty two genotypes of cotton**

Genotypes	Total crop duration (days)		
	May sowing	June sowing	July sowing
BC-025	218	215	217
BC-088	212	210	211
BC-044	216	217	218
BC-051	216	214	215
BC-063	212	211	213
BC-040	211	216	217
BC-0116	208	210	211
BC-0165	199	180	183
BC-0188	198	200	201
BC-0197	193	190	195
BC-0252	203	202	204
BC-0294	185	183	186
BC-0342	164	160	162
BC-0405	181	179	180
BC-0406	168	161	162
SR-01	210	209	211
SR-05	197	198	200
CB-8	194	196	195
CB-9	211	212	212
CB-10	157	154	156
NAM-77	153	153	155
C-2602	148	145	150
Mean	193.36	191.59	193.31

## CONCLUSION

Five genotypes (C-2602, NAM-77, BC-0406, CB-10 and BC-0342) were found 50-60 days earlier than the cultivar CB-9 and performed better in respect of different parameters including days required to first flowering, days required for first boll splitting and number of sympodial branchial branches per plant.

## REFERENCES

- Anonymous. 1989. Bangabandhu Sheikh Mujibur Rahman Agricultural University. Annual Weather Report. Meteorological Station, BSMRAU, Gazipur.
- Bhatt, J. G. 1996. Cotton Physiology. Indian Society for Cotton Improvement, Mumbai-400019. p 43.
- Craig, W. B. and Robert, L. N. 2005. Phenological and morphological components of cotton crop maturity. Crop Sci. Soc. America. 45: 1497-1503.
- Hosny, A. A. and Shahine, I. M. M. 1995. Modeling the effect of sowing dates on Egyptian cotton. Cotton Res. Ins. Agric. Res. Center. Giza Egypt. Ann. Agric. Sci. Moshtohor. 33: 21-37.

- Itnal, C. J., Radder, G. D., Halemani, H. L., Surkod, V. S. and Sajjan, G. C. 1993. Response of cotton genotypes to time of sowing in drylands. *Karnataka J. Agril. Sci.* 6(2): 117-120
- Shekara. B. G., Parasad, K. T. R., Sharanappa and Shivanna, S. 1988. Effect of sowing date on seed cotton yield of hybrid cotton (DCH-32) in central dry zone of Karnataka. *Current Res. Univ. Agric. Sci. (Bengalore)*. 27: 140-141.