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GROWTH AND YIELD RESPONSES OF BARI GOM-25 IN RELATION TO SOWING TIME

NARGIS JAHAN* AND A.M.M. GOLAM ADAM[1]

Department of Botany, University of Dhaka, Dhaka-1000. Bangladesh

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The average yield of wheat in Bangladesh is very low compared to other leading wheat growing countries of the world and may be attributed to a number of reasons including sowing time. The time of sowing has marked effects on growth and yield of most of the crops in different parts of the world. Optimum time of sowing for wheat is very important due to its requirements for temperature and light for emergence, growth and flowering (1). Too early sowing produces weak plants with poor root systems. Delay in sowing suppressed the yield, caused by reduction in the yield contributing traits like number of tillers, number of grains per spike and grain yield(2). A lot of literatures are available on the research work on different wheat varieties in relation to sowing time(3-10). The present study was undertaken to evaluate the performance of wheat under different time of sowing to find out the optimum sowing time for the variety BARI Gom-25.

A field experiment was conducted in the research field of the Department of Botany, University of Dhaka during November, 2011 to March, 2012 to investigate the effect of different sowing times on growth and yield performance of BARI Gom-25. The experiment was laid out in RCBD with split plot arrangements, replicated four times. The experimental field was prepared conventionally. Seeds were collected from BARI, Joydebpur, Gazipur. BARI Gom-25 is tolerant to moderate level of salinity released in 2010. Seeds were sterilized with 0.5% calcium hypochlorite and sown in lines 20 cm apart. Fertilizers were applied at doses recommended by BARI (260, 170, 110 and 125 kg per hectare of urea, triple super phosphate, muriate of potash and gypsum, respectively). Two-thirds of urea and a full amount of the other fertilizers were applied as a basal amount during final land preparation. Cow dung was also mixed uniformly at the rate of 9880 kg per hectare. The remaining urea was applied immediately after the first irrigation (at the age of 23 days). Weeding was done at the age of 18 days followed by thinning to keep plant to plant distance of 10 cm. Second and third irrigations were applied at the age of 40 and 70 days. The trial consisted of three dates of sowing: S_1 = 14th November, S_2 = 24th November and S_3 = 4th December, 2011. Data on the number of tillers and leaves

*Author for correspondence: <jahan.nargis@yahoo.com>. [1]Department of Botany, Jagannath University, Dhaka-1100, Bangladesh.

per plant were recorded weekly from the age of 35 days to harvest. Number of productive tillers per plant, number of grains per plant, 1000-seed weight (g), grain yield per plant (g) and harvest index (%) were calculated after harvest. The data were compiled and subjected to statistical analysis and treatments means were compared for significance by using LSD test at 5% level of probability[11].

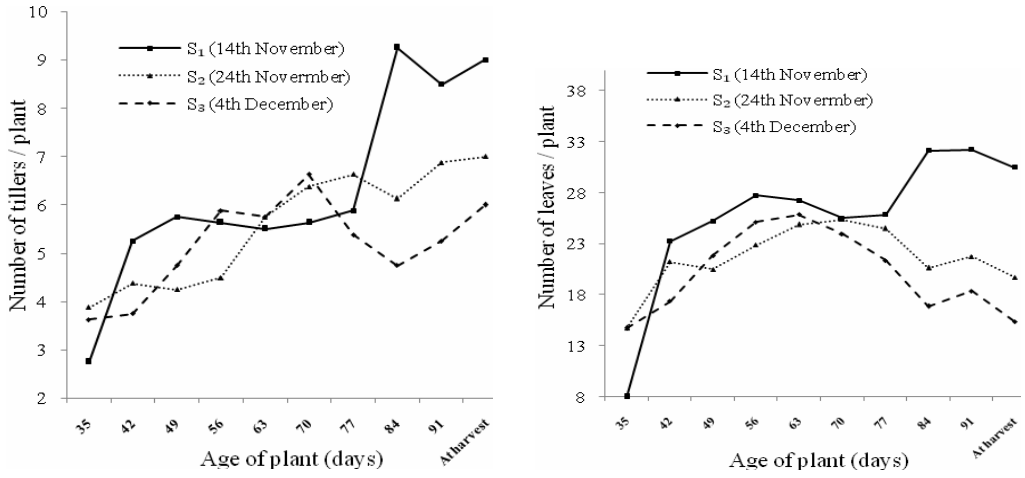

Fig. 1.Effects of sowing time on number of tillers and leaves per plant of BARI Gom-25 at different ages.

Results presented in Fig 1. showed that significantly highest number of tillers per plant was obtained from S_1 at the age of 42, 49, 84 and 91 days and also at harvest. At the age of 63 days similar number of tillers per plant (5.77) was obtained from both S_2 and S_3 treatments. Results obtained from this investigation is similar to the findings of Ansary *et al.*[2] who reported that delay in sowing caused reduction in the number of tillers in wheat. Baloch *et al.*[10] obtained non-significant effect on the number of tillers per unit area with sowing time. The maximum number of leaves per plant was also recorded from S_1 plants from the age of 42 days to harvest and sowing time had significant effect among the treatments in most of the cases. However, significantly highest number of leaves was obtained from both S_2 and S_3 at 35 days (Fig. 1). The increase in leaf number is of vital importance for photosynthetic activities.

Findings of the present study revealed that non-significantly highest number of grains per plant was obtained from S_2. Increase in number of grains per plant due to S_2 was 35.78 % higher over S_3. The higher number of grains per plant following S_2 was possibly due to increased number of productive tillers per plant. The maximum 1000-seed weight was recorded from S_1 followed by S_2. Late sown wheat (S_3) produced minimum 1000-seed weight in BARI Gom-25. There was a gradual decrease in 1000-seed

weight with delayed sowing (Table 1). The results are in accordance with the findings of other investigators [5, 7-8].

Yield per plant was significantly influenced by sowing time and the maximum yield was obtained from S_2. It was 13.90 and 37.66% higher over S_1 and S_3, respectively. The higher yield might be due to the production of maximum number of productive tillers and grains per plant (Table 1). The maximum grain yield in S_2 also indicates that sowing in 24th November is the optimum time for this variety and beyond the optimum time yield per plant decreased. Baloch *et al*.[10] recorded maximum grain yield when sown in November and minimum in December. Kumar *et al*.[3] obtained better grain yield from 20th November sown wheat than 1st November and 10th December. Decrease in grain yield of wheat due to delay in sowing from 20th November onward was also reported by Singh and Uttam [12]. Findings of Ansary *et al*.[2] and Shahzad *et al*.[8] showed lower grain yield with delay sown wheat.

Table 1. Effects of sowing time on yield contributing characters and yield of BARI Gom-25.

Treatments	Productive tillers/ plant (no.)	Grains/ plant (no.)	1000 seeds weight (g)	Grain yield/ plant (g)	Harvest index (%)
S_1 (14th November)	4.88 ab	203.50	51.58 a	10.43 ab	60.30 a
S_2 (24th November)	5.63 a	229.13	51.38 a	11.88 a	52.29 b
S_3 (4th December)	4.13 b	168.75	51.05 b	8.63 b	48.73 b
CV (%)	4.48	18.40	1.76	9.38	6.42
LSD (0.05)	1.16	NS	0.30	2.37	6.55

Mean in a vertical column followed by same letter or without letter do not differ significantly at 5% level. NS indicates non-significant.

Date of sowing significantly influenced the harvest index of BARI Gom-25 and the highest was recorded from S_1. The maximum decrease in grain yield due to late sowing (4th December) might be due to their genotypic characters. Kumar *et al*.[3], Shah and Akmal[4] and Ali *et al*.[9] reported that different varieties responded differently on different sowing dates. Akhtar *et al*.[6] concluded that regardless of varieties or cultivars, better yields were obtained when wheat was sown after 15th and before 30th November. Therefore, to obtain better growth and higher yield, 24th November is the optimum time for sowing of BARI Gom-25.

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