RESEARCH

Thirty three research projects were organized by SAURES in the year 2010-2011. The results of the projects have been presented as extended summary in this report.

RESEARCH PROJECTS

EFFECT OF WATER AND HEAT STRESS ON GROWTH AND YIELD PERFORMANCE OF SOME WHEAT (*Triticum aestivum* L.) VARITIES/LINES

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Extended Summary

Experiment 1.

Effect of genotypes on the yield performance of wheat (*Triticum aestivum* L.) under water scarcity condition

The experiment was conducted at the experimental field of Sher-e-Bangla Agricultural University, Dhaka during the period from November 2008 to March 2009. Seeds of 19 genotypes of wheat were sown on November 30 to determine their relative performance on the yield and yield components providing only one flood irrigation at early stage. The experiment was laid out in randomized complete block design (RCBD) with three replications. The highest yield (3.32 t h^{-1}) was obtained in the variety Gourab and the lowest from Pavan-76(2.64 t h^{-1}). In respect of yield the sequence of genotypes in Gourab ≥ BL-1022>Sufi>kolyan Sona>BAW1104> BL1883≥BAW1051>BAW917>BAW1064>Prodip>Bijoy> IVT-9>Sonora>Sourab> Shatabdhi ≥IVT -10> Flag-66>Kanchan >Pavan-76. Gourab produced the higest yield. It also produced the highest weight of 1000 seeds (49.10g) which was statistically similar (48.62g) to Kolyan Sona and the lowest weight (36.98g) was found in Pavan-76. The maximum number of spikelets per spike (19.73) was found in Prodip, while the minimum number (15.30) was recorded in IVT-10. Results revealed that the genotype which produced the highest yield that also produced best yields components characters. Low yielding genotype produced decreased leaf area, TDM, fewer fertile spikelet. Genotypes Gourab and Bl-1022 showed better performance over the others in respect of growth, reproductive, yield and yield contributing characters among the genotypes under study.

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Experiment 2.

Efficacy of different genotypes on the growth and yield of wheat (*Triticum aestivum* L.) under normal water supply condition

The experiment was conducted to observe the efficacy of different genotypes on the growth and yield of wheat (*Triticum aestivum* L.) at the Agricultural Botany experimental field of Sher-e-Bangla Agricultural University, Dhaka during the period from November 2008 to March 2009 providing three flood irrigation at early stage, tillering stage and panicle initiation stage if the crop. The experiment comprised of 19 wheat genotypes such as BL-1883, BAW-1104, BAW-1064, Sonora, Sourab, Prodip, Fang 60, Gourab, BAW-917, IVT-9, Sufi, Shatabdi, Kanchan, Pavan-76, IVT-10, Bijoy, BL-1022, Kalyan Sona and BAW-1051. The experiment was laid out in Randomized Complete Block Design (RCBD) with three replications. The maximum days to starting emergence of seedling (6.00 days) was recorded from wheat genotype IVT-10 and the lowest days to start emergence of seedling (4.67 days) were for BL-1883, Sourab, BAU-917, Sufi, Shatabdi and Kanchan. At 30, 40, 50, 60, 70 DAS and harvest, the longest plant (24.53 cm, 49.29 cm, 71.24 cm, 89.51 cm, 94.23 cm and 98.33 cm) was obtained from the wheat genotype Gourab and the shortest plant (19.80 cm, 41.88 cm, 62.19 cm, 76.12 cm, 77.63 cm and 80.96 cm) was recorded from the wheat genotype Pavan-76. The maximum number of fertile tillers per plant (5.50) was observed in the wheat genotype Gourab, whereas the minimum number (4.83) was recorded from the wheat genotype Pavan-76. The highest leaf area of flag leaf (39.99 cm^2) was obtained from the wheat genotype Gourab and the lowest (20.65 cm^2) was recorded from the wheat genotype Gourab and the shortest length (13.52 cm) was obtained from the wheat genotype Pavan -76. The maximum number of spikelets per spike (23.07) was found from the wheat genotype BL – 1883, while the minimum number (17.97) was recorded from the wheat genotype IVT – 10. The maximum number of filled grains per spike (56.47) was found from the wheat genotype Gourab, again the minimum number (29.77) was obtained from the wheat genotype Pavan – 76. The highest weight of 1000 seeds (51.34 g) was recorded from the wheat genotype Gourab and the lowest weight (39.99 g) was found from the wheat genotype Pavan – 76. The highest weight of grain per hectare (4.14 ton) was obtained from the wheat genotype Gourab, while the lowest weight (3.43 ton) from the wheat genotype Pavan – 76. The highest weight of straw per hectare (5.79 ton) was obtained from the wheat genotype Gourab, while the lowest weight (3.86 ton) was found in the wheat genotype Gourab, while the lowest weight (3.86 ton) was found in the wheat genotype Pavan – 76.

Experiment 3.

Influence of different genotypes on the growth and yield of wheat (*Triticum aestivum* L.) under late sown in high temperature

The experiment was conducted at the experimental field of Sher-e-Bangla Agricultural University, Dhaka during the period from December 2008 to April 2009 to observe the influence of different genotypes on the growth and yield of late sown wheat (Triticum aestivum L.). Normal irrigation was provided to observe the influence of late sown wheat experimentally. The experiment comprised of 19 wheat varieties such as BL 1883, BAW-1104, BAW – 1064, Sonora, Sourab, Prodip, Fang 60, Gourab, BAW – 917, IVT-9, Sufi, Shatabdi, Kanchan, Pavan-76, IVT-10, Bijoy, BL-1022, Kalyan Sona and BAW-1051. The experiment was laid out in Randomized Complete Block Design (RCBD) with three replications. There were 57 plots for the experiment having the size of 2 m × 1.5 m. plots. 19 genotypes of wheat were randomly distributed in the plots. Data on different growth characters and yield attributes were recorded to find out the suitable variety in response to the effect of high temperature stress for late sowing with normal irrigation. All the genotypes were affected due to high temperature but Gourob was the less affected variety due to late planting. Plant height, number of leaf/plant, leaf area index which were higher than other genotypes. Among the 19 genotypes Gourob showed better performance in respect of ear length, 1000 seed weight, dry mater content/ plant, shoot dry matter content. Due to high temperature all the genotypes were affected but Gourob showed higher yield (2.55 ton/ha) than other genotypes and IVT – 10 showed lower yield (1.47 ton/ha). In the experiment among the wheat genotypes Gourab was superior over the others in case of late sowing and IVT – 10 was severely affected by high temperature in terms of different growth and yield contributing characters.

Experiment 4.

Influence of different late sown high temperature condition on the growth and yield performance of different genotypes of wheat (*Triticum aestivum* L.)

The experiment was carried out at the Agricultural Botany experimental field of Sher-e-Bangla Agricultural University, Dhaka during the period from November 2009 to March 2010 to observe the effect sowing date on the growth and yield performance of different genotypes of wheat. The experiment comprised of two factors; Factors A: Sowing dates (4 sowing dates) – S_1: Sowing on 17 November, 2009; S_2: Sowing on 30 November, 2009; S_3: Sowing on 15 December, 2009 and S_4: Sowing on 30 December, 2009 and Factor B: Wheat genotypes (9 wheat genotypes) – V_1: BAW-1064, V_2: Sourab, V_3: Prodip, V_4: Fang-60, V_5: Gourab, V_6: Sufi, V_7: Shatabdi, V_8: Pavan-76 and V_9: Bijoy. The experiment was laid out in tow factor Randomized complete Block Design (RCBD) with three replications. Data on different yield contributing characters and yield were recorded and significant variation was recorded for sowing dates, wheat genotypes and their interaction effect. The maximum days to starting of seedling emergence (5.92) was recorded from S_4, whereas the minimum days (4.82) was observed from. At 60,40,50,60 DAS and harvest the longest plant (45.09 cm, 66.40 cm, 82.56 cm, 86.20 cm and 89.83 cm) was recorded from S_2 and the shortest plant (40.78 cm, 59.51 cm, 74.99 cm, 77.87 cm and 80.65 cm) from S_4. The highest grain yield ha^{-1} (3.64 ton) was found from S_2, whereas the lowest (3.15 ton) was recorded from S_4. The highest straw yield ha^{-1} (4.71 ton) was recorded from S_2, whereas the lowest (3.86 ton) from S_4. The maximum days to starting of seedling emergence (5.28) was found from V_2, again the minimum days (5.05) was recorded from V_1. At 30, 40, 50, 60 DAS and harvest the longest plant (45.36 cm, 66.34 cm, 82.77 cm, 86.84 cm and 90.50 cm) was obtained from V_5, whereas the shortest plant (40.70 cm, 61.20 cm, 76.44 cm, 79.57 cm and 81.64 cm) was recorded from V_9. The highest grain yield ha^{-1} (3.67 ton) was found from V_2 and the lowest (3.10 ton) was observed from V_9. The straw yield ha^{-1} (4.60 ton) was observed from V_2, again the lowest (4.04 ton) was obtained from V_7. The maximum days to starting of seedling emergence (6.33) were observed from S_4V_4, while the minimum days (4.33) from the treatment combination S_1V_4. At 30, 40, 50, 60 DAS and harvest the longest plant (49.41 cm, 71.85 cm, 89.72 cm, 94.24 cm and 98.36 cm) was observed from S_2V_5, again the shortest plant (39.37 cm, 56.89 cm, 71.63 cm, 73.79 cm and 76.31 cm) was recorded from S_4V_9. The highest grain yield ha^{-1}(4.15 ton) was found from S_2V_2, whereas the lowest (2.85 ton) from S_4V_7. The highest straw yield ha^{-1} (5.73 ton) was found from S_2V_2, again the lowest (3.34 ton) from S_4V_7. The variety gourab provided better and steady yield in case of first, second and third sowings whereas, sourab and BAW-1064 provided better yield when sown on 30 November. However, the yield was reduced in case of all the varieties when sown on 30 December.