Response of some flax strains to row spacing and phosphorus fertilization

Tara Ahmed Mohamed Salim Omar

This investigation was carried out at Zarzura Agricultural Research Station, Etay-El-Baroud, Behira Governorate in 1999/2000 and 2000/2001 seasons, to study the response of five flax genotypes to row spacing and phosphorus fertilizer rates.. A split split-plot design with three replications was carried out in both seasons. The main plots were the two row spacing (10 and 20 cm between rows). The sub-plots were the three phosphorus rates zero, 15 and 30 kg P2O5 / fad. The sub-sub plots were the five genotypes i.e. the four strains; S-400/4/4/2, S-422/10/1/3, Si, Sakha 2and Giza 7.The sub-sub plot area was 6m2 (1/700 fad) and sowing dates were 20 and 23 November for the first and second seasons, respectively.The main findings are: Growth characters1-Plant height was significantly affected by row spacing and P rates across sampling dates. Significant differences among genotypes in plant height were detected. The tallest plants were those of Sakha2, while the shortest plants were recorded for S-422/10 in both seasons.2-In both seasons, the 10 cm rows outyielded that of the 20 cm rows in dry matter accumulation. Dry weight / plant was significantly affected by P rates across the three sampling dates in both seasons. Also, genotypes significantly differed indry weight. The highest value of dry weight was recorded by Sakha 2, but the lowest was produced by S-422/10.3-Genotypes differed significantly in crop growth rate (CGR) atthe first period, while the difference was insignificant in the second period.4-Insignificant difference was detected between the two rowspacing on relative growth rate (RGR) except the first period of the first season. whereas, RGR was significantly affectedby P rates at the first period of the second season. The RGR was not significantly affected by the genotypes.Yield components1-Total plant height was not significantly affected by rowspacing in the two seasons, but it was significantly affected by P rates significant differences among the genotypes wereobtained in plant height. The tallest plants were obtained withSakha 2, while the shortest plants were recorded for S-422/10 in both seasons.2-Technical length was significantly affected by row spacing in the first season only, while it was significantly affected by Prates in both seasons. Sakha 2 gave the highest technicallength, while the lowest technical length was recorded by S-422/10.3-Length of capsules zone was not significantly affected byrow spacing in the first season, while it was significantly affected in the second one. P rates or the genotypes did not influence the length of capsules zone.4-Main stem diameter was not affected by either row spacing or P rates in the two seasons. Genotypes varied markedly in main stem diameter. S-422/10 gave greater stem diameter, but a thinner stem diameter was obtained from Sakha 2.5-Number of fruiting branches / plant was not significantly affected by row spacing, however, significantly affected by P rates. Genotypes significantly differed in both seasons. Sakha2 gave the highest number of fruiting branches / plant, while the lowest number of fruiting branches was recorded by S-422/10.6-Number of capsules / plant was significantly affected by both row spacing and P rates in the first season only. Results showed significant differences among the tested genotypes in this trait.7-Number of seeds / capsule was affected significantly by row spacing in the second season only. Increasing P rates significantly increased the number of seeds / capsule in two seasons. Results showed that there were significant differences among the genotypes. Sakha 2 recorded the highest number of seeds / capsule, while the lowest number was that obtained from S-422/10.8-Number of seeds / plant increased significantly by both row spacing and P rates. Results indicated significant differences among the genotypes in this character.9-The

1000-seed weight was not significantly affected by row spacing in both season, while it was significantly affected by P rates in the second season only. Significant variationsamong genotypes were present. Sakha 2 gave the highest values, while the lowest values were recorded byS 1.10-Straw yield / plant was not significantly affected by row spacing or P rates in the two seasons. While significant differences between genotypes were observed in straw yield.11-Seed yield / plant significantly increased as row spacing increased in the second season only. P rates significantly affected seed yield / plant in the two seasons. Significant differences among the genotypes were present. Sakha 2 gave the highest seed yield, while the lowest seed yield was recorded by Si.Yield1-Straw yield / fad increased significantly with 10 cm row spacing in the first season only. Straw yield was not significantly affected by P rates in both seasons. Results showed significant differences among the tested genotypes, with the highest yield being produced by Sakha 2, while the lowest was recorded by the S-422/10.2-Seed yield / fad increased significantly by row spacing and P rates in the first season only. Results indicated significant differences among the tested genotypes. Sakha 2 gave the highest yield, while the lowest yield was recorded by Si.3-Oil yield / fad increased significantly by increasing row spacing and P rate in both seasons. Significant differences among the genotypes were also found. Sakha 2 and Si gave the highest and the lowest yield, respectively.SUMMARY-68-4- Row spacing did not significantly affect fiber yield / fad in both seasons, while there were significant effects for P rates. Significant differences among the tested genotypes were found. The highest and lowest yields were recorded by Sakha 2 and S-422/10, respectively.Quality characters1-Results indicated that row spacing affected fiber length significantly in the first season only. The 10 cm distance between rows gave longer fibers in both seasons. Fiber length was significantly affected by P rates and the genotypes significantly differed in this trait. The longest fibers were recorded by Sakha 2 while the shortest fiber were obtained by S-422/10.2-Total fiber percentage significantly increased by increasing row spacing and P rates in both seasons. Genotypes significantly differed in fiber percentage, the highest fiber percentage was obtained from Sakha 2 while the lowest percentage was recorded with S-422/10.3-Fiber fineness significantly decreased by increasing row spacing, while it was significantly increased by increasing P rate in both seasons. There were significant differences among the tested genotypes. Sakha 2 was the highest in Nm, while S-422/10 was the lowest in Nm.4-Oil percentage significantly increased by increasing row spacing and P rates in both seasons. Results indicated that there were significant differences among the genotypes.Seed oil percentage was higher in Sakha 2 while the lowest was obtained from Sl,Correlation studiesI- Seed yield and related characters1-Sakha 2 : Correlation coefficients showed that seed yield was poorly correlated with other variable. However, the correlation between seed yield / plant and seeds / capsule was highly significant.2-S-422/ 10: The relationship between seed yield / plant and each of the number of fruiting branches / plant, the number of seeds / capsules, seeds / plant and seed index were significant and positive.3-SI: Highly significant positive correlation coefficient was detected between seed yield / plant and each of the number capsules / plant, seeds / capsule and seeds / plant.4-Giza 7: Correlation coefficients between seed yield / plant and number of fruiting branches / plant were significant and positive. Similar result was obtained between number of seeds / capsules and number of seeds / plant.5-S-400 / 4: The association between seed yield / plant and number of seeds / plant was highly significant, whereas poor correlation could be observed with other variable. Also, highly significant positive correlations were observed between number of fruiting branches / plant and each of number of seeds / capsule and seeds / plant. Similar results were obtained between capsules / plant and seeds / plant, and between seeds / capsule and seeds / plant.II- Straw yield and related characters1-Sakha 2: Straw yield / plant was poorly correlated with other variable. Highly significant positive correlations existed between total plant height and each of technical length and fiber length, Also, a similar result was obtained between technical length and fiber length .2-S-422 /10 : Straw yield / plant and each of total plant height, technical length and fiber length were insignificant and negative, while the association was insignificant and positive between straw yield / plant and each of stem diameter and fiber percentage.3-S1 : Highly significant positive correlations were observed between straw yield / plant and fiber percentage, as well as between straw yield / plant and stem diameter. Also, highly significant positive correlations were observed between total plant height and

both of technical length ,fiber length and fiber percentage.4-Giza 7 : Straw yield / plant was poorly correlated with other variables. The relationship between total plant height and each of technical length and fiber length was highly significant and positive. A similar result was obtained between technical length and fiber length.5-S-400 /4: Highly significant positive correlation coefficientswere obtained between straw yield / plant and technical length, Also, a similar result was obtained between total plant height and both of fiber length and fiber percentageIII - Correlation coefficients of row spacing and P rates1-Sakha 2 : Significant negative correlation between row spacing and the technical length was detected. While, the relationship between P rates and each of the number of seeds / capsule, seed index, straw yield / plant and seed yield / plant were significant and positive.2-S-422/10: Insignificant negative correlation between row spacing and each of the total plant height and technical length, whereas, the relationship between row spacing and each of number of seeds / capsule and straw yield / plant was significant and positive.3-Si: Significant positive correlation between row spacing and each of number of seeds / capsule and seed yield / plant, as well as between P rates and each of total plant height, seeds / capsule and seed yield / plant were detected.4-Giza 7: Insignificant positive correlation between row spacing and all studied characters. While, the association between P rates and each of technical length, seed index and seed yield / plant were significant and positive.5-S.400/4: Insignificant positive correlation between row spacing and all studied characters. whereas, the relationship between P rates and each of the total plant height, technical length, number of seeds / capsule and seed yield / plant were significant and positive.