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ABESTRACT

Two field experiments were carried out at the Farm of Sids Research Station, Bani-Swef Governorate, Agricultural Research Center, Egypt, during the two successive summer seasons of 2016 and 2017. The objective of this study was to investigate the effect of three population density through five plant distribution, *i.e.* 64615 plants/fed from 10 cm between hills with leaving one plant/hill (A), 64615 plants/fed from 20 cm between hills with leaving two plants/hill (B), 43076 plants/fed from 15 cm between hills with leaving one plant/hill (c), 43076 plants/fed from 30 cm between hills with leaving two plants/hill (D) and 51692 plants/fed from 25 cm between hills with leaving two plants/hill(control) (E) under four nitrogen fertilizer levels, i.e. (30, 45, 60 and 75 Kg N/fed) on growth, flowering, yield and its components as well as fiber quality properties for the Egyptian cotton, variety Giza 95.

Significant differences were detected for allmost growth, flowers, yield and its components as well as fiber properties of cotton among the three plant densities through five plant distributions or four nitrogen fertilizer levels during 2016 and 2017 seasons.

Data showed that planting pattern of D significantly surpassed the other plant densities and distributions and gave the greatest mean values of No. of monopodial/plant, No. of sympodial/plant, No. of fruiting sites/plant, No. of open bolls/plant, No. of total bolls/plant, % of open bolls/plant, % of shedding bolls/plant, seed cotton yield/plant, boll weight, seed index, 50 % span length, 2.5 % span length and length uniformity ratio as well as significantly gave the shortest plants, the lower position of the first sympodium, the shortest period from planting to first flower and boll opening appearances and lowest mean values of plant losses %. Meanwhile, planting pattern of C gave the greatest fiber strength and lowest fiber finesses (highest micronaire reading). Results illustrated that planting pattern of A gave the greatest mean values of plant height, the first fruiting node, No. of days to first flower appearance, No. of days to first boll opening appearance, lint percentage and plant losses %. However, planting pattern of B gave the greatest mean values of No. of plants/fed at harvest and fiber finesses (lowest micronaire reading). Resulted recorded that planting pattern of E significantly surpassed the other plant densities and distributions in seed cotton yield/fed and lint cotton yield/fed in the first and second seasons.

Results revealed that cotton plants which fertilized by 75 kg N/fed was the most effective level and significantly recorded the maximum mean values for plant height, No. of monopodial/plant, No. of sympodial/plant, No. of days to first flower appearance, No. of fruiting sites/plant, No. of days to first boll opening appearance, No. of open bolls/plant, No. of total

bolls/plant, seed cotton yield/plant, boll weight, seed index, seed cotton yield/fed, lint cotton yield/fed, length uniformity ratio and fiber finesses (lowest micronaire reading) during the first and second seasons, % of shedding bolls/plant in the second season only and 50 % span length in the first season only. On the other hand, % of open bolls/plant and lint % were significantly decreased by increasing nitrogen fertilizer levels from 30 to 75 kg N/fed. Meanwhile, the first fruiting node, No. of un-open bolls/plant, lint index, No. of plants/fed, plant losses % , 2.5 span length, fiber strength and fiber elongation % were not significantly affected by increasing nitrogen fertilizer levels from 30 to 45, 60 and 75 kg N/fed during the first and second seasons.

Data showed that plant height, No. of monopodial/plant, No. of sympodial/plant, No. of days to first flower appearance, No. of fruiting sites/plant, No. of days to first boll opening appearance, No. of open bolls/plant, total No. of bolls/plant, open bolls/plant %, shedding bolls/plant %, seed cotton yield/plant, boll weight, seed cotton yield/fed and lint cotton yield/fed were significantly affected by the interaction between the three plant population densities through the five plant distributions and the four nitrogen fertilizer levels during 2016 and 2017 seasons. On the other hand, the first fruiting node, No. of un-open bolls/plant, seed index, lint %, lint index, No. of plants/fed, plant losses % and fiber properties under study were not affected by the interaction.

Results revealed that planting pattern of D under soil fertilized by 75 kg N/fed gave the maximum mean values of No. of monopodial/plant, No. of sympodial/plant, No. of fruiting sites/plant, No. of open bolls/plant, No. of total bolls/plant, shedding bolls/plant %, seed cotton yield/plant and boll weight, also gave the shortest period from planting to first flower and boll opening appearances. Meanwhile, planting the same plant population density under the lowest nitrogen fertilizer level (30 kg N/fed) gave the greatest mean values No. of open bolls/plant %. Results illustrated that the greatest mean values of plant height and the longest period from planting to first flower and boll opening appearances which obtained from planting pattern of A when received 75 kg N/fed during both growing seasons. Results indicated that planting pattern of E with soil fertilized by 75 kg N/fed produced the maximum mean values of seed cotton yields/fed and lint cotton yields/fed.

It could be summarized that planting cotton plants (Giza 95) under planting patterns of D or E with soil fertilized by 75 kg N/fed to maximized quantity and quality of cotton yield characters.