ABSTRACT

Sanaa Gomaa Eid Mohamed Gebaly, Relationship between nitrogen levels and plant distribution with yield and environmental factors in cotton fields, Unpublished Doctor of Philosophy Dissertation, Institute of Environmental Studies and Research, Ain Shams Univ., 2003.

Eighteen treatments which were the combination of six plant densities and distribution of cotton cv. Giza 89 i.e. 66666, 53333, 44444, 44444, 35555 and 29629 plants/fed were resulted from inter ridge widths (60 and 90 cm) within ridge spacing of 20, 25 and 30 cm and three nitrogen levels (60, 75 and 90 kg N/fed) were tried in split-plot design with four replication during 2000 and 2001 seasons at Gemmeiza Agricultural Research Station, El-Gharbiya Governorate. The aim of this investigation was to study the effect of relationship between nitrogen level and plant distribution with yield and environmental factors in cotton fields.

The data revealed that the number of vegetative and fruiting branches, number of leaves per plant, dry weight of the different organs, leaf area per plant, chlorophyll content, number of mature bolls per plant and seed cotton yield per plant were increased significantly by decreasing plant population from 66666 to 29629 plants per feddan, while it increased plant length and seed cotton yield per feddan by increasing plant population from 29629 to 66666 plants per feddan. Although the above range of plant population did not reach the significance with seed index, lint percentage and fiber properties.

Nitrogen application up to 90 kg N/fed induced maximum values of final plant length, number of vegetative and fruiting branches, number of leaves, number of bolls, leaf area per plant, leaf area index, SLW, NAR, CGR, RGR, number of mature bolls per plant and relative humidity percentage but decreased the light penetration, leaf and soil temperature, boll weight, seed cotton yield per feddan. On the other hand, seed index, lint percentage and fiber properties were not affected by N levels.

The interaction between plant distribution and density and nitrogen level had significant influence on all characters studied herein except, plant length, number of vegetative and fruiting branches, number of leaves per plant, SLA, boll weight, seed index, lint percentage and fiber properties in both seasons.

The correlation of number of mature bolls/plant or boll weight or seed cotton yield/plant were positive and significant with light intensity in the middle

and lower third of plant height, leaf and soil temperature at 60, 90, 120 and 150 days after sowing in both seasons.

Key words: Cotton, Nitrogen levels, Plant distribution, Plant densities, Environmental factors, Growth parameters, Yield and yield components, Fiber properties, Chemical constitutes.

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