EFFECT OF NITROGEN, PHOSPHORUS AND POTASSIUM NANO FERTILIZERS ON PRODUCTION AND QUALITY OF EGYPTIAN COTTON

By

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ABSTRACT

Two field experiments were carried out at the Agricultural Experimental and Research Station, Faculty of Agriculture, Cairo University, Giza, Egypt in two seasons in years 2016 and 2017 to evaluate NPK nano-fertilizers application, times, methods and rates on vegetation growth analysis, yield and fiber properties of Egyptian cotton cultivar (Giza 90). The experiment was laid out in a split-split plot in a randomized complete block design arrangement with four replications. Treatments included two application times were applied in main plots, two application methods foliar and soil in sub-plots and four rates applications of control (100% soil application traditional recommended NPK fertilizer dose (RFD) and nano NPK fertilizers 12.5%, 25% and 50% RFD) were applied in sub-sub-plots.

Obtained results indicated that, the application of three times of NPK nano-fertilizers gave higher plants, total dry weight, crop growth rate, relative growth rate, leaf area and leaf area index than two times. Foliar NPK nano fertilizers application of all traits recorded higher values of most studied parameters than soil application. Nano-fertilizers at 50% RFD recorded values of studied parameter statistically at par with control traditional (100% RFD). Treatments of 12.5% were at par with 25% NPK nano fertilizers for the most studied growth parameters. Interactions between the studied three factors were significant in some growth stages.

Significant increases of total and open bolls per plant, boll weight and seed cotton yield as a result of the application of three times NPK nano-fertilizers than two times. Foliar nano-fertilizers application of these traits recorded higher values at the previous parameters than soil application. In the most of studied parameters nano-fertilizers at 50% RFD recorded values statistically at par with control traditional (100% RFD). Also, treatments of 12.5% at par with 25% NPK nano-fertilizers. Interactions between the studied three factors were insignificant in studied parameters except lint%. Whereas, the highest values of previous traits were obtained from plots treated with 50% RFD nano NPK with split 3 times and applied by foliar application in most cases.

The application rates of NPK nano fertilizers significantly affected on studied fiber properties. Also, times and methods of application on fiber length in second season and application methods on Length uniformity Index second seasons. All the interaction between study factors cleared no significant effect on fiber quality parameters except interaction between time of application and method of application and (between time of application and rates of application) had a significant effect on fiber strength in second season only.

Key words: cotton, *Gossypium barbadense* L., NPK nano-fertilizers, nano-phosphorus, nano-nitrogen, nano-potassium, growth parameters, seed cotton yield. fertilizes foliar and soil application, cotton fiber quality.

DEDICATION

I dedicate this work

To whom my heartfelt thanks; my parents for their all lovely offered and supports in all my life

To my husband for his patience, cooperation and encouragement during my study and to my beautiful and intelligent kids, Asmaa, Adam, Alaa and Esraa

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