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EFFECT OF BACTERIAL BIOFERTILIZATION AND N-LEVELS ON YIELD AND QUALITY OF SUGAR BEET (VARIETY LOLA)

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ABSTRACT

Two field experiments were conduced in Sakha Agricultural Research Station farm to investigate response of sugar beet plant var. Lola to nitrogen levels (100%, 75% and 50% of recommended dose) and/or combined microbial inoculation (*Azotobacter chroococcum* + *Bacillus megatherium*). Results showed that N-application significantly increased top and root yields, root fresh weight and sugar yield (ton/fed.), but did not significantly affect the percentages of N, P, K, α-amino nitrogen, Na, sucrose, extractability, sugar extractability/plant and purity.

Microbial inoculation significantly increased top and root yields and root fresh weight, while did not significantly influence percentages of N, P, K, sucrose, sugar extracted/P or extractability, α-amino nitrogen and Na.

The treatment, inoculation + 75% N gave the highest economic net return without exerting a bad effect on yield quality. Therefore, the study recommended the application of this treatment as an agricultural process for sugar beet, where it showed a positive effect on the yield and resulted in saving a lot amounts of chemical N fertilizer. The matter which is important in decreasing the deleterious effect of nitrogenous fertilizers residue on the environment.

INTRODUCTION

Sugar beet (*Beta vulgaris* L.) is a complementary sugar crop to narrow the gap between the consumed and produced sugar. In addition sugar beet is the second source of sugar production after sugar cane, where about 40% of sugar production all over the world is produced annually from sugar beet (El-Sayed *et al.*, 2007).

In Egypt, the cultivated area of sugar beet increased from 17000 feddan in 1982 to 168000 in 2005 (Tantawy *et al.*, 2006).

In recent years, agricultural sustainability has emerged as a worldwide is largely because of the increasing pressure on the limited supply of land for food production and the irrelevance of present-day conventional agriculture on non-renewable fossil fuel. A considerable interest exists in adopting alternative agricultural practices and low input systems with the belief that present conventional agricultural systems using soluble fertilizers have detrimental effects on soil physical, chemical and biological properties, plants, farm animals and the environment (Murata and Goh, 1997).

In Egyptian soils total phosphorus content is present in unavailable inorganic or organic forms. Increasing alkalinity of soil increases unavailability of phosphorus (Balba 1981).