STUDIES ON ABSORPTION OF SOME MINERAL ELEMENTS AND BIOCHEMICAL COMPONENTS OF SUGAR BEET PLANTS UNDER CONDITIONS OF POTASSIUM FERTILIZATION

By

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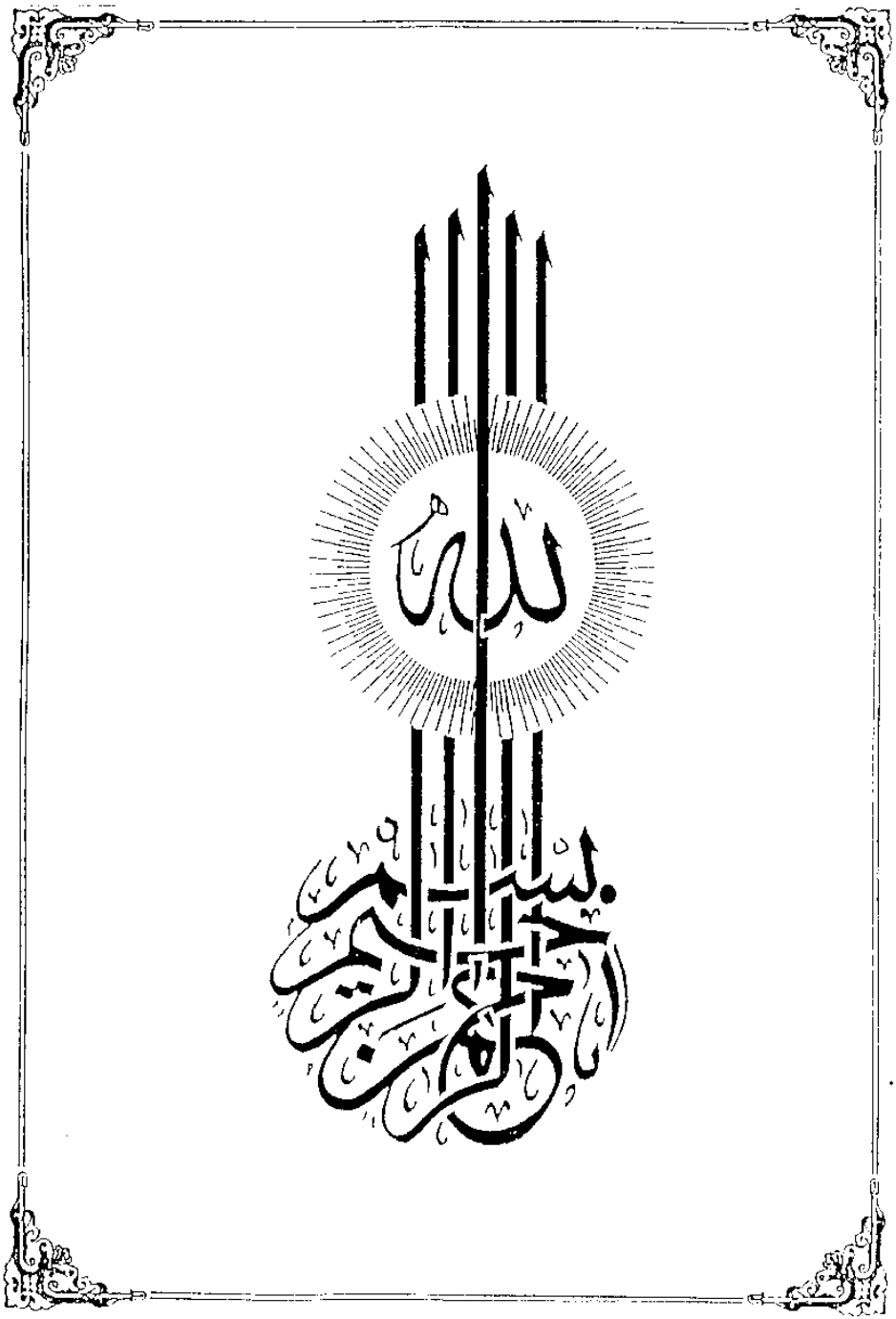

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ABSTRACT

Three pot experiments were carried out to evaluate the effect of fertilization along with mycorrhizal inoculation on growth and yield as well as nutritional status and some biochemical constituents of sugar-beet plants.

Obtained data indicated that, fertilization with nitrogen, phosphorus or potassium usually increased the dry matter content of studied plants and their nutrient uptake as well as carbohydrates status, the effect being dependent on both source and rate of applied fertilizer with growth stage being also effective. Different trend was obtained with mycorrhizal inoculation which seemed to be hazardous for studied sugar beet plants particularly what concerning sucrose of roots; again, effect was relatively dependent on source and rate of applied fertilizer as well as growth stage of concerned plants.

Finally, it may be worth to mention that invertase enzyme appeared to be almost not affected with either fertilization system or mycorrhizal inoculation. Of course, such trend may be a resultant of several factors dealing with metabolic activities within different plant tissues.

KEY WORDS

Sugar beet plants

Nitrogen fertilization

Phosphorus fertilization

Potassium fertilization

Plant growth

Pigments

Reducing sugars

Sucrose

Total soluble sugars

Total carbohydrates

N-status in plants

P-status in plants

K-status in plants

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INTRODUCTION

1. INTRODUCTION

Sugar-beet represents one of the sugar crops expected to be greatly economical in Egypt. This crop is known to be affected by several factors one of which is fertilization practice particularly what concerning potassium which is well-known to be a nutrient having roles in synthesis and translocation of carbohydrates. In fact, sugar beet is classified as a plant that has a high requirement for potassium; more potassium is usually absorbed by sugar beet than any other mineral nutrient element.

More nitrogen is usually required by plants than for any of the other essential mineral nutrients. It is an essential constituent for several metabolities including proteins, amides, amino acids along with nucleic acids as well as chlorophyll.

Phosphorus is one of the essential nutrients present in the plant both in inorganic form and in organic combinations. Inorganic phosphate is found in sugar beet at a concentration of about 60 percent of the total phosphorus in the harvested roots and about 40 percent of the totalphosphorus in leaf blades. The organic compounds that contain phosphorus include several metabilities such