

**EFFECT OF ORGANIC AND BIO-FERTILIZATION AND SOIL SOLARIZATION
ON WEED CONTROL AND POTATO YIELD AND ITS COMPONENTS
BY**

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ABSTRACT

Diamant potatoes (*Solanum tuberosum* L.) were grown in two successive winter seasons of 2004/2005 and 2005/2006 in the Desert Research Center at EL-Sheikh Zowayed, North Sinai Governorate, to study the effect of organic-fertilizers, i.e., 70 kg N/fed. as a cattle and chicken manures (3 cattle:1 chicken), 70 kg /fed. as a compost and 12 m² chicken manure + 46.5 kg P₂O₅ + 82 kg N +48kg K₂O (as a check), bio-fertilizer application (Biogen + Phosphorine + Potassumag) and soil solarization on yield and its component of potato plants. The results indicated that weed characters were drastically affected by soil solarization which significantly reduced number, fresh and dry weight of total weeds after 4 and 8 weeks from potato planting compared with non-solarized. Using cattle manure increased average tuber number, size and yield/plant compared with compost treatment. Check treatment gave the highest values compared with organic treatments. The most pronounced effect of the check treatment was increasing tuber contents of dry matter, specific gravity, starch, protein and nitrate. Soil solarization gave higher values of average tuber size and plant yield, while bio-fertilizers application had no significant effects on all studied characters, except reducing tuber content of total protein and nitrate.

Key words: Potato, Organic-fertilization, Bio-fertilization, Soil solarization, Potato yield, Specific gravity, Dry matter, Starch and Nitrate.

INTRODUCTION

In Egypt potato (*Solanum tuberosum* L.) is considered the second vegetable crop after tomato and the first with regard to exportation (MALR, 2005). Potato is a highly cash crop, so it's managed for production of maximum yield using high rates of N fertilizer which resulted in an imbalanced nutritional status of plants and consequently high nitrate accumulation which is considered a health hazard (Rabie *et al.*, 2002).

The development of agriculture practices focusing on short-term productivity based on intensive use of external inputs, such as chemical fertilizers and pesticides, which may have negative environmental impacts and

harmful health hazards for both humans and animals. So, the production of organic agriculture products without inputs of chemical pesticides and synthetic fertilizers has become the profitable area of farming as consumers became more concerned about possible effects of chemicals (Abu-Hussien, 2001).

Increasing N fertilizer levels gave the highest potato yield (EL-Gamal, 1996; Grzeskiewicz and Trawczynski, 1998; Stavrova *et al.*, 2002; Reust and Neyroud, 2003), increased potato tuber dry matter content (EL-Gamal, 1996; Hassandokht and Kashi, 2000), increased starch content (Hassandokht and Kashi, 2000) and increased