# USE OF *BACILLUS CIRCULANS* AS BIO-ACCELERATOR ENRICHING COMPOSTED AGRICULTURAL WASTES

## II- Evaluation of produced compost under organic farming system


## ABSTRACT

The quality of composted rice straw produced from the application of mixed culture of 4 effective *Bacillus circulans* strains as bioaccelerator plus animal manure as organic accelerator was evaluated. Assessment comprised a comparison of the effects of the composted rice straw with the recommended dose of chicken manure and the effects of applied rates (50, 100 and 200% of the recommended dose) of that compost on growth, yield and NPK contents of potato and broccoli grown under organic farming regulations. Data showed that application of the composted rice straw was always superior to that of chicken manure in enhancing total and specific microbial proliferation along with microbial activities in the rhizosphere of potato and broccoli, particularly after 60 days from cultivation. The superiority was also reflected on growth and yield parameters of both crops. The application of 200% of the recommended dose of the composted rice straw also gave more pronounced effects on all above-mentioned parameters compared with the recommended dose or 50% of that dose.


**Key words**: Organic farming, Composted rice straw, Chicken manure, Application rate, Potato, Broccoli.

## INTRODUCTION

One of the major characteristics of Egyptian soils is the deficiency in organic matter content, being in the range of 0.2-1%. Organic matter amendment is also particularly important at the time being, due to the world movement toward natural resources.

At present, bio-organic agriculture is a concept that receiving greater consideration in various regions around the world. The importance of this technology is extended to be a potential solution to numerous problems facing present day agriculture. Accumulative research suggests that organic agriculture results in less erosion **(Reganold *et al.*, 1987)**, less leaching of nutrients and higher carbon storage **(Drinkwater *et al.*, 1995)**, promoting soil structure formation **(Pulleman *et al.*, 2003)**, enhancing soil biodiversity **(Mäder *et al.*, 2002; Oehl *et al.*, 2004)**, alleviating environmental stresses **(Horrigan *et al.*, 2002; Macilwain, 2004)**.

Compost amendment is one of the major practices in bio-organic agriculture and is mainly responsible for most of the above-mentioned beneficial effects **(Giusquiani *et al.*, 1995; Pfotzer and Schu¨ ler, 1997; Bazzoffi *et al.*, 1998)**. Since compost may be produced from different wastes it is very important to assess the quality of compost before its application in agriculture. Therefore, previous analyses of the material in relation to application of variable amendment demonstrate the quality of produced compost **(Masaguer *et al.*, 1999)**.

This study, therefore, aimed to evaluate the effect of composted rice straw produced with the use of *B. circulans* plus animal manure as accelerating factors on growth, yield and NPK content of potato and broccoli grown under bio-organic farming system.

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