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“Development on the margin”

## Influence of Quality Compost on Plant Growth and Mycorrhizal Colonisation in Corn

GETINET DESALEGN<sup>1</sup>, ERWIN BINNER<sup>2</sup>, ANDREAS LÖSSL<sup>1</sup>, HORST VIERHEILIG<sup>3</sup>, PETER LIEBHARD<sup>1</sup>, PETER LECHNER<sup>2</sup>

<sup>1</sup>University of Natural Resources and Life Sciences (BOKU), Institute of Agronomy and Plant Breeding, Austria

<sup>2</sup>University of Natural Resources and Life Sciences (BOKU), Institute of Waste Management, Austria

<sup>3</sup>Estación Experimental del Zaidín, Spanish Council for Scientific Research (CSIC), Departamento de Microbiología de Suelos, Spain

### Abstract

The soil functions for agricultural productivity and environmental sustainability depend on soil organic matter. At present, its degradation is a rising problem in most agricultural lands worldwide. The maintenance and improvement of organic matter is an effective mechanism to combat soil or land degradation, reversing the declining trend in agricultural productivity and preserving the environment for present and future generations. The objectives of this study were to evaluate the effects of a high quality compost application to soil on (i) total dry matter and other yield parameters of corn (*Zea mays* L.), (ii) plant nutrients uptake, and (iii) the infectivity potential of indigenous arbuscular mycorrhizal fungus (*Glomus mosseae*) of corn roots. The two tested composts were produced from biowaste alone or a mixture of biowaste and horse manure. Corn plants were grown in pots in the greenhouse, their yield structures, mycorrhizal root colonisation and soil nutrient bioavailability were determined. Overall, results indicated that compost application to soils increased plant height, leaf area index and biomass dry matter yield of corn significantly ( $p < 0.001$ ) as compared to the control treatment. The maximum plant growth and major nutrient composition in the tissue were found in the pure biowaste treated pots. The highest indigenous mycorrhizal colonisation was recorded in the control treatment, while compost amendment negatively affected them. That might be associated with higher bioavailability of plant nutrients, particularly phosphorus in the compost treated pots than in non-treated one. Hence, it is plausible to conclude that the highest bioavailability of plant nutrients and the highest functional groups of soil organic matter are noted after quality compost addition. Such noted changes play an important role in the soil functions to improve plant productivity. A similar long-term experiment is essential for a better understanding of the changes in soil functions as well as to better follow organic matter development.

**Keywords:** Compost quality, corn, mycorrhiza, plant nutrients