

BIOAVAILABLE PHOSPHORUS AND HUMIC SUBSTANCES IN COMPOST – EFFECT ON PLANT GROWTH

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Abstract

Rising prices for mineral fertilizers and food have prioritized the issue of food security. To ensure stability and sustainability in agriculture, European Union aims to increase the support of local fertilizer supply. Thus, there has been a rising interest in organic fertilizers, including compost. Collecting and composting organic wastes at the local level can decrease the need for waste transport, management costs and ensure quality fertilizers for locals. Composts, however can vary in input materials, production technologies, and quality, which all affect the fertilization properties. Six composts composed of alternative organic waste (fish waste, horse manure, sewage sludge and green waste) were investigated. The aim of the study was to identify the effect of different composts on the plant growth depending on the share of bioavailable phosphorus (P) and the concentration of humic substances (HS). All selected composts were produced similarly in outdoor compost piles in at least 10 m³ scale in 2018. In plant growth pot-experiments composts were mixed with nutrient poor mineral soil. Nutrient content of soil and composts were measured separately. The content of HS was determined solely from the composts. The experiment was conducted in one week period with Garden cress (*Lepidium sativum*) and two weeks period with Garden vetch (*Vicia Sativa L*). After the experiment the plant aboveground biomass and root biomass were quantified. The impact of the share of bioavailable P and HS on plant growth was determined.

Keywords: organic waste, organic fertilizer, phosphorus forms, humic acid, fulvic acid