

# THE INFLUENCE OF VERMICOMPOSTS ON PLANT GROWTH AND PEST INCIDENCE

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## SUMMARY

During the last twenty years, considerable progress has been made in developing methods of breaking down organic wastes, including animal wastes, crop residues, urban and industrial organic refuse and sewage biosolids; which has been termed vermicomposting. Vermicomposts have a fine particulate structure, low C:N ratio, with the organic matter oxidized and stabilized and converted into humic materials. They contain nutrients transformed into plant-available forms and are extremely microbially-active. Additions of low rates of substitution of vermicomposts into greenhouse soil-less plant growth media or low application rates to field crops have consistently increased plant germination, growth, flowering, and fruiting, independent of nutrient availability. This can be at least partially-attributed to the production, by the greatly increased microbial populations, of plant growth regulators including plant hormones, such as indole-acetic acid, gibberellins and cytokinins and also humic acids which simulate the effects of hormones.

Vermicomposts can suppress the incidence of plant pathogens such as *Pythium*, *Rhizoctonia* and *Verticillium* significantly, by general or specific suppression

mechanisms. Vermicomposts applied to soils have considerable influence on the trophic structure of nematode populations, suppressing plant parasitic species populations significantly. Greenhouse experiments have shown that low substitutions of vermicomposts into soil-less plant growth media can decrease the amounts feeding and damage by sucking pests such as aphids and mealy bugs and chewing pests such as caterpillars.

All of these various inputs of vermicomposts into plant growth produce significant and economic increases in yields of ornamental, vegetable, and fruit crops. Vermicomposting has considerable potential for the large-scale conversion of environmentally undesirable organic wastes into value-added materials with great potential in horticulture and agriculture.