

Effects of humic acids from vermicomposts on plant growth

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The interactions between earthworms and microorganisms can produce significant quantities of plant growth hormones and humic acids which act as plant regulators. Experiments were designed to evaluate the effects of humic acids extracted from vermicompost and compare them with the action of commercial humic acid in combination with a commercial plant growth hormone, indole acetic acid (IAA) which is a commonly found in vermicomposts. In the first experiments, humic acids were extracted from cattle, food and paper waste vermicomposts. They were applied to a plant growth medium, Metro-Mix360 (MM360), at rates of 0, 250 or 500 mg humates kg⁻¹ dry wt. of MM360, to marigold, pepper, and strawberry plants in the greenhouse. Substitution of humates ranging from 250 to 1000 mg kg⁻¹ MM360 increased the growth of marigold and pepper roots, and increased the growth of roots and numbers of fruits of strawberries significantly. In other experiments, humic acids extracted from food waste vermicomposts were applied at a rate of 500 mg kg⁻¹ dry wt. of MM360, singly or in combination with IAA at a rate of 10⁻⁵ μM, to pepper seedlings. This experiment was designed to compare the differences in effects between the most effective dosage rate of humic acid from food waste, a phytohormone (IAA), and a commercial source of humic acid. The numbers of pepper flowers and fruits increased significantly in response to treatment with humic acid, IAA and a combination of humic acid and IAA. Peppers treated with humic acids extracted from food waste vermicomposts produced significantly more fruits and flowers than those treated with commercially-produced humic acids.