

Influences of vermicomposts, produced by earthworms and microorganisms from cattle manure, food waste and paper waste, on the germination, growth and flowering of petunias in the greenhouse

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Vermicomposts have been shown to promote the germination, growth, and yields of plants. This paper aims to demonstrate the effects of vermicomposts produced from three types of wastes on growth and flowering of petunias which are an important U.S. flowering crop.

Vermicomposts, produced commercially from cattle manure, food wastes and paper wastes, were substituted at a range of different concentrations into with a soilless commercial bedding plant container medium, Metro-Mix 360 (MM360), to evaluate their effects on the growth and flowering of petunias (*Petunia* sp.) in the greenhouse. Seeds of petunia (var. Dreams Neon Rose F1) were sown into 100, 90, 80, 70, 60, 50, 40, 30, 20 or 10% MM360 substituted with 0, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100% cattle manure, food waste or paper waste vermicompost. Each type of vermicompost constituted a separate sub-experiment. All plants were watered three times weekly with 200ppm Peter's nutrient solution, containing all nutrients required, from sowing up to 79 days. Substitutions with all of the vermicomposts into MM360 increased germination significantly on almost all sampling dates. Shoot dry weights increased significantly after substituting MM360 with 10–60% cattle manure vermicompost, and 10–100% of both food waste and paper waste vermicomposts. Numbers of flowers increased significantly after MM360 substitutions with 20–40% of both cattle manure and food waste vermicomposts, and by only 40% of paper waste vermicompost. There were no positive correlations between the increases in numbers of flowers, and the amounts of mineral-N and microbial biomass-N in the potting mixtures, or the concentrations of N in the shoot tissues of petunias. Factors such as improvement of the physical structure of the potting medium, increases in populations of beneficial microorganisms, and most probably, the availability of plant growth-influencing-substances such as hormones and humates produced by microorganisms during vermicomposting, probably contributed to the increased petunia germination, growth and flowering.