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Implications for Using Compost in Vegetable Production

Six compost products were obtained for the purpose of evaluating the plant nutrient, carbon, and organic matter contents. The composts included in the study were a yard waste compost (containing no animal manure), two cow manure based products, mushroom compost (containing manure and straw), and two compost products that contained 25% and 33% separated swine solids. The carbon sources used ranged from wood waste to cotton gin trash. The benefits and potential issues associated with using compost to fertilize vegetables was studied using tomatoes. The constituent application rates (e.g. N, Cu, Zn, Na) resulting from spreading compost at the agronomic rates for P₂O₅ and K₂O were calculated and evaluated. Tomatoes were selected because they require a small amount of pre-plant N (45 kg/ha), and large amounts of P₂O₅ (190 kg/ha) and K₂O (224 kg/ha). In addition, spreading compost prior to field preparation would most likely fit easily with current cultural practices. It was determined that the only compost products that were unacceptable for use on tomatoes fields were yard waste compost and mushroom compost. Application of the yard waste compost at the agronomic rate for P₂O₅ provided 538% more pre-plant N than required. Fertilization with mushroom compost provided excess N along with excessive amounts of sodium (113 kg Na/ha). The data and nutrient balancing calculations point out that application recommendations based on a prescribed volume (application depth) or mass per unit area (t/ha) are not useful. Instead, compost application rates need to be determined based on analysis of the plant nutrients in a compost product, soil-test results, and the nutrient requirements of the crop to be grown.

Author: John P. Chastain

University Affiliation: Clemson University

Co-Author(s): K.P. Moore and C. Frase