USE OF WASTE AS FERTILIZER

PHOSPHORUS RELEASE IN SOIL FERTILIZED WITH NPK ORGANOMINERAL FERTILIZERS BASED ON SWINE MANURE COMPOST

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The production of organomineral fertilizers from agricultural waste has potential to supply nutrients to production systems and is an environmentally appropriate way of disposing of organic waste. In Fertilizer Technology Laboratory at Embrapa Solos, NPK organomineral fertilizers were produced based on swine manure compost, five for conventional production, and three adapted for organic production systems. The objective was to evaluate the release of phosphorus from NPK organomineral fertilizers in the soil, under laboratory conditions. For a dosage equivalent to 100 mg of P, ten fertilizers were applied in plastic cups containing 100 g of soil Argissolo Vermelho Amarelo, using the eight organomineral fertilizers based on swine manure compost, two commercial phosphate fertilizers, MAP and Termophosphate, in addition to a control without fertilization (control), in a completely randomized design with three replications and seven collection periods (1, 7, 15, 30, 45, 60 and 90 days). After fertilization, the water soil content in each plot was maintained at field capacity. After each incubation period, the soil was dried, crushed and sieved, and subsequently taken for analysis of the levels of available P in the soil. Statistical analysis showed that there was a difference between the treatments in the evaluated collections, and proving that all fertilizers increased the levels of available P with their application to the soil. The levels of P available in the control ranged between 4.2 and 6.6 mg kg-1, indicating that they are soils with low P availability, serving as an excellent indicator of soil fertility. Treatment with MAP showed a high value of 180.0 mg kg-1 with one day of incubation, and in the rest of the collections available P stabilized between 43.0 and 62.4 mg kg-1. Among the organomineral fertilizers with MAP and KCl in its formulation, the treatment with the addition of MgO and micronutrients showed the highest levels of available P, being only lower than the treatment with MAP with one day of incubation, and then the highest value, varying between 104 and 165 mg kg-1. The treatment fertilized with thermophosphate, on the other hand, showed low levels up to 7 days of incubation with 45.4 mg kg-1, and between 15 and 45 days, it reached the highest values, between 106.0 and 136.7 mg kg-1, and reducing below 76 mg kg-1, in the last collections. The organomineral fertilizers adapted for organic agriculture showed levels of available P always lower than the treatment with thermophosphate and potassium sulfate, except for the treatment with the addition of MgO, bentonite, potassium silicate and micronutrients, which in the last collection reached high levels of 189 mg kg-1. These results demonstrate the ability of organomineral fertilizers based on swine manure compost to supply phosphorus to the soil, compared to commercial phosphate fertilizers.