



AGRONOMIC EFFICIENCY OF ANIMAL RESIDUES BASED PHOSPHORUS FERTILIZER

Jéssica Franciele Kaminski Ramos*, Julia Alfano Keller Ventura Neves Da Costa, Gabriel Carlos Francisco, Airton Kunz, Fabiane Goldschmidt Antes, Vinicius De Melo Benites, Jorge Makhlouta Alonso

*Universidade Federal Rural do Rio de Janeiro Embrapa Suínos e Aves Embrapa Solos jessicakaminski07@gmail.com

The high demand for phosphate fertilisers and the external dependence on these inputs highlight the need to develop strategies to meet the phosphorus (P)

eficiency of Brazilian soils. The country has a great potential for exploitation considering the large volume of agricultural waste generated in this sector. The use of fertilisers produced from the pyrolysis of bovine bones (Bone Char) and swine effluent (digestate) is a sustainable alternative destination for these residues. The practice promotes circular energy and enables the supply of P to plants. This work aimed to evaluate the dry matter production of maize the accumulation of P under the influence of fertilisation with agricultural residues. The experiment was conducted in a greenhouse, using a completely randomised design, with four treatments and four replications. The treatments were composed of agricultural residues (Bone Char and digestate), in addition to the reference fertiliser triple superphosphate (STP) and the control treatment (without P). The treatments were incorporated into the soil in full volume before the first planting, at a P dose of 160 mg kg-1 of soil. The experimental units were formed by pots with 2 kg of Red Latosol and a maize plant (Zea mays L., hybrid AG 8740 PRO3). Two crop of 45 days were carried out. After the experimental period, the shot of the plants was collected, conditioned in an oven at 65°C until complete drying and the dry mass of the aerial part was measured. P extraction was performed by nitroperchloric digestion and determination by the colorimetric method using UV/visible spectrophotometry. Shapiro Wilk and Bartlett's test were used to assess normality of residuals and homoscedasticity of variances, respectively. Means were compared using Scott Knott's mean test.

In the first crop, agricultural residues showed a positive response in the production of aboveground dry matter. "Bone Char" had a higher production equivalent to the reference treatment (STP), followed by "digestate". In the accumulated dry matter, all fertilization treatments were superior to the control treatment. "Bone Char" showed results similar to STP. The highest accumulation of P by maize in the first cultivation was observed with the application of "Bonechar", resulting in the same amount of P as STP. In the P accumulation, combining the two cultivations, "Bone Char" provided a greater accumulation of P in the plants. Fertilization with "Bone Char" can result in an agronomic performance equivalent to soluble fertilizer (STP). These agricultural residues can be a promising alternative to supply the deficiency of P in tropical soils and meet the demands of crops with high demand for this nutrient, such as maize.