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ASSESSMENT OF MICRONUTRIENT IN SOIL TREATED WITH ORGANIC FERTILIZER[1]

AVALIAÇÃO DE MICRONUTRIENTES EM SOLO TRATADO COM FERTILIZANTE ORGÂNICO

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Taking advantage of organic fertilizer for use in agriculture, may have beneficial effects for supplying organic matter and nutrients to the soil. The tested organic fertilizer is produced in a system of thermophilic composting of sewage sludge, the process by which it is mixed with chopped pruning urban, the crushed sugar cane and eucalyptus bark, and the mixture is subjected to aeration process revolving mechanical and oxidation promoted by an intense activity of microorganisms. The same is also additived with gypsum (Ca_2SO_4) in order to reduce the losses of ammonia from the process, helping to prevent odors and also attraction of vectors, besides enriching the material with calcium and sulfur, two macronutrients in plants. On the other hand the application of such compounds should be carefully monitored in order to prevent environmental risks from its use. This work aimed to evaluate the effect of rates of organic fertilizer (OF), in the Instituto de Zootecnia (IZ), in a Typic Acrudox soil, pH_{CaCl2}= 4.9, cultivated with Aries grass (*Panicum maximum*, Jacq.), without liming and focused in soil micronutrients contents. Treatments involved four rates of OF application: 0, 1.5, 3.0 and 4.5 t ha^{-1}, mixed with soil before sowing the grass. The experimental design was a randomized blocks, with five replications, in pots (3.34 dm^3). Soil samples were collected prior to the experiment (original soil) and after cultivation of the Aries grass. Were air dried and passed through sieves with mesh size of 2 mm and analyzed chemically. The micronutrients (B, Cu, Fe and Zn– mg dm^{-3}) were determined by atomic absorption, after extraction with a solution of DTPA, pH 7.3 (Raij et al., 2001). Data were analyzed by the mixed procedure of SAS V. 9.2; average qualitative treatments were compared by Tukey test at 5% probability. The degrees of freedom related to N rates (quantitative treatment) were decomposed into orthogonal polynomials; to obtain the best equation fits the data. OF at a dose of 1.5 kg ha^{-1} was sufficient to raise the contents of Cu, Zn at levels considered medium and not limiting, however this rate for boron has resulted in high levels in the soil. Boron content in soil increased linearly with the addition of OF from 0.13 to 58.2: B = 12.2(OF + 0.28), R^2=0.96. Typical visual symptoms of B toxicity were observed in the leaves of Aries grass at rates above 1.5 t ha^{-1} OF, that is, the burning of leaves, chlorosis and necrosis, often at the edges and tips of older leaves. Zn contents in analysis by extractant DTPA, varied from 0.7 to 5.1, according to the equation Zn= 0.93(OF+ 0.48), R^2=0.93. Cu content varied from 0.21 to 0.61, Cu= 0.087(OF + 1.97), R^2= 0.92. The use of organic fertilizer should be monitored very carefully, using small rates, because of the risks of causing harmful accumulation of heavy metals in soil. Thus it can result in nutrient imbalance, with restrictions on plant growth and environmental contamination.

Key words: acrudox soil, Ariesgrass, environmental sustainability, sewage sludge