NATURAL ROCK OF IPIRÁ EFFECTS ON COMMON BEAN (*PHASEOLUS VULGARIS*) PRODUCTION AND SOIL ACIDITY

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The Natural Rock of Ipirá is the commercial name of a product that presents as basic component the bentonite (Anônimo, 2006) that comes being tested with positive results on areas of crop exploration. The bentonite is a clay found in natural deposits presenting variable composition in accordance with local clime conditions from where the original material was formed. In water presence, the bentonite particles hydrate and expand forming a colloidal supension. In the maximum expansion, these particles move freely and due to the electric loads that they possess, form organized structures. Depending on the rock exchangeable cation, the bentonites can be calcic or sodic (Gopinath et al., 2003). They present characteristic stability and sometimes form porous surface quickly and has the capacity to liquefy and to form gel depending on the local humidity. Some of these clays are used as repellent pesticide in biological control of jungle plagues, medicinal plants and in traditional crops (Rossi, 2006). This research purposes is to test the efficiency of the Natural Land of Ipirá as fertilizer in the development and productivity of bean crop in comparison with commercial fertilizer applied in amounts based on Brazilian official recommendation.

The experiment was carried out in Santo Antonio de Goiás- Goiás State, Brazil in one acid Oxisol, poor in organic matter, in phosphorus, calcium, magnesium, manganese and zinc. The following treatments were studied: 1 = check treatment, 2 = low fertilizer dose - 250 kg/ha of 4:30:16 (N, P_2O_5, K_2O), 3 = 300 kg/ha of Natural Rock of Ipirá used as

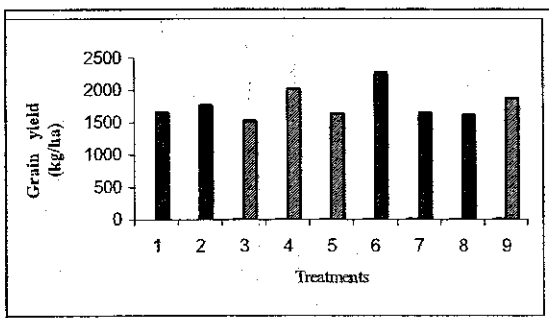

FIGURE 1. Effects of Natural Rock of Ipirá on grain yield of bean (kg/ha).

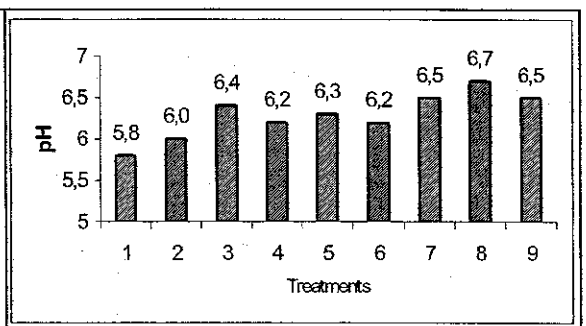

FIGURE 2. Effects of Natural Rock of Ipirá on soil pH (1:2,5 soil: water).

fertilizer, 4 = 300 kg/ha of Natural Rock and 250 kg/ha of 4:30:16 (N, P_2O_5, K_2O), 5 = limed soil and 300 kg/ha of Natural Rock of Ipirá plus 250 kg/ha of 4:30:16 (N, P_2O_5, K_2O), 6 = application of 1.000 kg/ha of Natural Rock of Ipirá, 7 = application of 3,000 kg/ha of Natural Rock of Ipirá,

8 = 9,000 kg/ha of Natural Rock of Ipirá and 9 = application of 27,000 kg/ha of Natural Rock Ipirá.

The common bean was cultivated as irrigated crop under central pivot. The parameters of production and soil characteristics observed were grain yield, pH, soil concentration of Ca and Mg. The bean production was influenced by the Natural Rock of Ipora application (Figure 1). High production was obtained by applying high amounts of Natural Rock of Ipirá but the production obtained by application of 300 kg/ha of Natural Rock plus 250 kg/ha of 4:30:16 (N, P_2O_5, K_2O) was similar to that obtained in parcels where 1,000 kg/ha of Natural Rock of Ipirá were applied. Higher soil pH, Ca and Mg values were observed in plots where Natural Rock of Ipirá was applied (Figure 2).

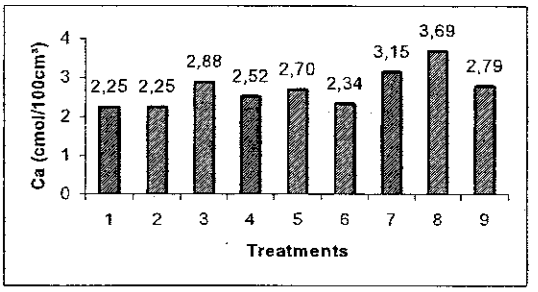

FIGURE 3. Effects of Natural Rock of Ipirá on soil calcium (Ca) concentrations.

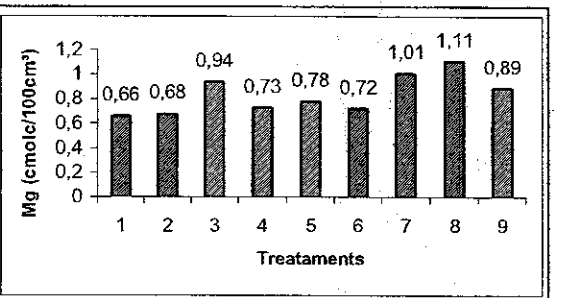

FIGURE 4. Effects of Natural Rock of Ipirá on soil magnesium (Mg) concentrations.

Bean crop is known by its needs to high soil fertility. As the results obtained, the best grain yields were observed in plots that present the highest pH (Figure1) values and Ca and Mg (Figures 3 and 4) concentrations. . Both calcium and magnesium are considered important nutrients for bean crop. On the other hand, in pH between 5.7 and 6.8, the majority of nutrients are disposable for plants (Thung & Oliveira, 1998). The best grain production in this research was observed in parcels presenting soil pH from 6.2 to 6.7. The Natural Rock of Ipirá functioned as soil conditioning, contributing for the high bean grain production.

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