

SUMMARY

In an ultisol of Lamas province, San Martin department, in the Peruvian amazon region, was conducted two experiments with organic and mineral amendments application, in order to recuperate unfertile abandoned lands (acid soil, pH 5.0) and incorporate them into profitable agriculture.

In a first experiment, the immediate and residual effect of various doses of vermicompost (HL) and phosphoric rock of bayovar(RF) was evaluated on the yield of crops in the rotation system: Corn (*Zea mays* L) – Cowpea (*Vigna unguiculata* L) - Corn (*Zea mays* L) - Soybean (*Glycine max* Merrill), using varieties traditionally used by farmers (corn, var "Marginal 28 tropical"; Cowpea var "San Roque"; Soybean var. "nacional").

In the second experiment the doses of calcium magnesium amendment called "magnecal" was evaluated on yields of the crop rotation: Corn - Soybean, using genetically improved varieties (maize, var "INIA-602" and Soybean, var. "cristalina")

In both experiments, the evolution of soil chemical characteristics was evaluated in the same time as the effect of the application of the amendments.

Randomized Complete Block statistical design (BCA) was used in the experiments with 16 treatments in a first case (HL-RF) and 09 treatments in the second case (Magnecal), and 04 replications for both.

Treatments for HL-RF experiment were combinations of humus increasing doses (0, 10, 15 and 20 t/ha). For the experiment with the amendment magnecal, doses were 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5 and 4.0 t/ha. The carbonate content of the material used was 77% CaCO_3 and 19% MgCO_3 .

The outstanding results for the experiment with application of vermicompost-phosphate rock were those who received the highest doses of humus (15 and 20 t/ha) in combination with the highest doses of RF (150 and 200 kg/ha P_2O_5).

The highest yields for marginal 28 tropical corn (first sowing) was 1107 and 1105 kg/ha. In cowpea San Roque variety (second sowing), yields were 2224 kg/ha and 2099 kg/ha. For marginal 28-T corn (third sowing), yields were 1674 kg/ha and 1544 kg/ha. For "nacional" variety soybean (fourth sowing) yields were 1485 kg/ha and 1222 kg/ha.

The lower yields were those who did not receive humus applications. In corn were 518 kg/ha and 512 kg/ha. For cowpea 1406 and 1298 kg/ha. For corn yields were 509 kg/ha and 489 kg/ha. Finally, for soybean were 428.4 kg/ha and 373.9 kg/ha.

Corn and soybean were the crops less tolerant to high aluminum concentrations present in the soil, however both reacted positively to humus and PR applications improving their performance with combined doses of 15 to 20 t/ha of humus and 150 to 200 kg/ha of P_2O_5 .

With magnecal application, the results found that doses of 3.0, 3.5 and 4.0 t/ha of the amendment had better effect on crop yields with 4057 and 4659 kg/ha in corn "INIA-602" variety and 1447 and 1651 kg/ha for "cristalina" soybean variety. For both crops without amendment witnesses gave lower yields with 2696 and 569 kg/ha for corn and soybean, respectively. However, INIA variety corn was tolerant to soil acidity, while soybean was sensitive.

In chemical soil characteristics, it was found that applications of vermicompost and phosphate rock bayovar increased soil pH in shape gradually as the increase of the respective doses.

The soil organic matter increased in direct relation to the increase of the applied dose of humus being greater with doses of 15 and 20 t/ha. This implies a greater contribution of nitrogen to crops that are expressed in higher yields.

Available soil phosphorus had increases in accordance with increasing doses of rock phosphate applied. Doses of 150 and 200 kg/ha of P_2O_5 were the most salient.

The content of exchangeable calcium and magnesium also increased with the application of vermicompost and phosphate rock in combination.

Finally, the content of exchangeable aluminum decreased inversely with increasing doses of humus and PR. This showed drastic decrease aluminum saturation in the soil exchange complex effect of the combined application of humus and phosphoric rock.

Moreover, the effects of the application of soil amendment magnecal were stronger. Regard soil pH and content exchangeable magnesium and calcium, increased in direct relation to increasing doses of lime. In turn, the aluminum + hydrogen and potassium exchangeables, were inversely related, decreasing with increasing doses of lime.