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“Bridging the gap between increasing knowledge and decreasing resources”

## Application of Poultry Manure with Zeolite Reduces the Use of Commercial Fertilisers and Improves the Soil Fertility in Organic Sugar Cane Production

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### Abstract

The enterprise “Carlos Baliño”, which is the only producer of organic sugar cane in Cuba, carries out various projects focussing on technologies for the sustainable management of sugar cane plantations. To fulfil the international standards expensive imported products are applied, such as the bio stimulant of organic origin Enerplant®<sup>®</sup>, produced in Mexico, and K<sub>2</sub>SO<sub>4</sub> because of the common poverty of potassium (K) in Cuban soils and the high K demand of sugar cane. However, deposits of poultry manure absorbed in zeolite (Man-Zeo) exist as residues near the “Carlos Baliño” enterprise and could be applied in order to reduce the application rate of imported products. To evaluate the effect of Man-Zeo as single application and combined with K and Enerplant®<sup>®</sup> an experiment under production conditions in macro plots was carried out on a Rhodic Eutruxox soil (organic matter 2.6%; pH 6.3; K content 60.0 mg kg<sup>-1</sup>soil, H<sub>2</sub>SO<sub>4</sub> extraction). The following treatments (single and in combination) were applied: control (without any application), K supply (100 kg ha<sup>-1</sup>), K supply (50 kg ha<sup>-1</sup>), Man-Zeo (5 t ha<sup>-1</sup>, N 1.52%; P 2.01%; K 0.97%), Enerplant®<sup>®</sup> 1 dose, Enerplant®<sup>®</sup> 2 doses. Plant and soil characteristics were investigated after the harvest of the sugar cane. The application of 5 t ha<sup>-1</sup> Man-Zeo reduced the necessity of K application from 100 to only 50 kg ha<sup>-1</sup> and the use of Enerplant®<sup>®</sup> from two to one application. Enerplant®<sup>®</sup> showed poor results when applied without further nutrients. The treatments including Man-Zeo increased the stability of soil aggregates, the bioavailable contents of P and K in soil and the diversity of soil macro fauna, mainly regarding the sub-class of *Oligochaeta*. The results showed the high potential of residues to improve soil fertility and plant growth.

**Keywords:** Fertiliser, organic, sugar cane