

SITE SPECIFIC SOIL FERTILITY MANAGEMENT OF AN OXISOL CULTIVATED WITH CORN FOR APPLICATION OF LIME AND GYPSUM

A.M. Coelho¹, G.J. de O. Lima², T.F. Cunha²

¹Embrapa Maize and Sorghum Research Institute, Sete Lagoas- MG, Brazil,

E-mail: amcoelho@cnpmc.embrapa.br, telephone +55-31-3027-1145, fax +55-31- 3027-1188

²Campo Agricultural and Environmental Analyses, Paracatu-MG, Brazil,

E-mail: ap@campoanalises.com.br, telephone +55-38-3671-1164

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Abstract

Due to the necessity to improve soil fertility diagnostic, the researches have been searched for more efficient technologies on agronomic and environmental aspects. One of these technologies is the use of the concept of site specific for soil fertility management. This research was conducted in a farm field (100 ha) located in Corinto, Minas Gerais state, in the 2007/2008 growing season. The soil is classified as Silt Clay Oxisol, cropped with corn and irrigated with a center-pivot sprinkler irrigation system. Grid cell of 1 ha, was used for collecting soil samples from 0 to 20 cm and 20 to 40 cm depths. Data of pH, Al^{3+} , Ca^{2+} , Mg^{2+} , CEC, base saturation (BS), Al^{3+} saturation and organic matter were submitted to geostatistical analysis and interpolated by point-kriging using the modeled semi-variograms. Based on the maps of BS and Al^{3+} saturation, it was possible to define zones of management for application of lime and gypsum. The threshold used to the definition of the rates of lime was 60 % of BS in the top of 20 cm. The criteria based on values of Ca ($<0.5 \text{ cmol/dm}^3$) and Al^{3+} saturation ($>25 \%$) in the subsoil (20 to 40 cm) were used for gypsum application. With these informations, maps of application of lime and gypsum at variable rate were generated. The rates of lime range from 0 to 3 t/ha and for gypsum of 0 and 1 t/ha. The costs of soil sampling with GPS, soil chemical analyses, field mapping with GIS and application of lime and gypsum, are evaluated.