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Spatial dependence of pH in a crop-livestock system in the southwest of Amazon

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Introduction
The high level of precipitation observed in the Amazonia and the original material of the soil are conducive to the high level of acidity on the soils. This edaphic attribute is responsible to low integrity and sustainable productivity in agrossystems in Brazil. In this work, we report the geostatistic analysis and results 8 years of cropping under no till and integrated crop/livestock systems on soil pH in the Brazilian Amazon.

Material and Methods
The experiment is located at the research station of Embrapa (406440 S; 9027781 W and 406700 S, 9027357 W) in soil types are dystrophic red-yellow oxisol, under no tillage (crop and livestock system) since 2008 (Passos et al., 2013). The clime is humid tropical (well-defined dry and rainy season) according to Köppen's Climate Classification. In 2012, the soil was sampled at a depth of 0 – 10 cm, in a grid of 30m x 30m, totaling 128 sampling points in intersect lines. The data were analyzed by descriptive statistics, normality test, trend analysis and verification of spatial dependence by means of experimental semivariograms and adjusted the variables presenting spatial dependence. Finally performing ordinary kriging of data, generating maps of prediction of the variables under study, and analyzed quality with cokriging.

Results and Conclusions
The pH values for asymmetry and kurtosis revealed is not normal distributions. The data set with coefficient of variation (CV) equal to 4,8%, are considered low-variance (<10%). The semivariance were adjusted using the Circular, adjustment method presented better performance, with parameters: *nugget effect (C_0)* of 0,04, *sill (C_0+C_1)* of 0,07 and *range (a)* of 136 meters. The semivariograms revealed moderate spatial dependence *($C_0/(C_0+C_1)x100$)* indicate 64% (*nugget effect* between 26-75% of the *sill*). Despite adequate yields achieved in last years in the area (Passos et al., 2013); above the state average; the area presents pH values consider highly acidic that are agronomically inappropriate for the most cash crops.
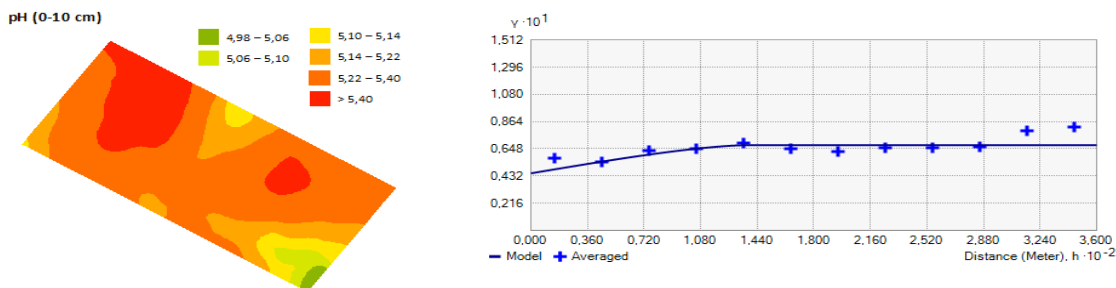

Figure 1 – Map of pH estimated by the kriging and adjust semivariogram.

References cited
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