

## Water, Food, Energy & Innovation for a Sustainable World

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American Society of Agronomy | Crop Science Society of America | Soil Science Society of America

**Start**

**285-4 Surface Application of Lime and Phosphogypsum to Improve Fertilizer Use Efficiency of Soybean and Common Beans Cultivated Under No-Tillage System in Brazilian Savanna.**

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*Tuesday, November 5, 2013*

*Tampa Convention Center, East Hall*

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Nowadays, more than 50% of grains production in Brazil, especially soybeans, comes from the Savanna region. However, the cost of production is increasing each year, especially due to the application of high amounts of fertilizers which are responsible for about 30% of production costs. In addition, more than half of the fertilizers used in Brazil are imported. For these reasons there is a need to increase fertilizer use efficiency. Generally, soils from the Brazilian Savanna region are acidic, poor in Ca and Mg, and present toxicity of aluminum. Thus, lime application is essential to correct acidity, to supply Ca and Mg, and to improve NPK fertilizers use efficiency. The use of phosphogypsum is also an important strategy for improving fertilizer use efficiency by increasing the base saturation in the subsurface soil layers. A field study was carried out in an acidic clayey Rhodic Ferralsol, in 2010, 2011, and 2012 growing seasons, aiming to evaluate the effect of annual surface application of lime and phosphogypsum to improve fertilizer use efficiency of soybean and common bean crops cultivated under no-till system. The experiment was carried out in a complete randomized block design with four replications and sixteen treatments arranged in a 4x4 factorial scheme. The factor A was soil correction: control, lime, lime+ phosphogypsum, and phosphogypsum. The factor B was level of NPK fertilization: 0%, 50%, 100%, and 150% of recommended rate for each crop. We applied 2 t ha<sup>-1</sup> of lime and 0.5 t ha<sup>-1</sup> of phosphogypsum annually. The results showed that annual surface application of lime alone or lime plus phosphogypsum increased the productivity of both crops fertilized with NPK, and also increased the efficiency of NPK fertilization. The application of gypsum alone did not affect fertilization efficiency, and caused decreasing in productivity in the treatment without NPK fertilization.

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