

Increased Crop Yield and Economic Return and Improved Soil Quality Due to Land Application of FGD-Gypsum

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ABSTRACT

The use of high-sulfur coal for power generation in the United States requires the removal of SO₂ produced during burning in order to meet clean air regulations. Some scrubbing technologies lead to the production of large amounts of flue gas desulfurization (FGD)-gypsum. Gypsum is a soluble source of the plant nutrients Ca and S and can also improve the physical and chemical properties of soils. However, there are few reports on the use of FGD-gypsum for enhancement of crop growth or soil quality in agriculture. FGD-gypsum, used as a S fertilizer, was applied at a rate of 30 lbs S/acre to an agricultural soil (Wooster silt loam, Typic Fragiudalf). Corn (*Zea mays*) grain yield was statistically ($P \leq 0.05$) increased by 18.3% in 2002 and 6.6% in 2003 as compared to a no-treatment control. Based upon measurements of soil physical and chemical properties, the quality of a Blount soil (Aeric Epiaqualf) in Ohio was improved by application of 1,500 to 3,000 lbs of FGD-gypsum/acre. Economic benefits of land application of FGD-gypsum to no-tillage agricultural fields in Ohio were evaluated, and the return on investment of a gypsum/no-tillage system was compared with a no-gypsum/conventional tillage system. Results indicated that the gypsum/no-tillage system had substantial economic advantages compared to the no-gypsum/conventional tillage system.

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