

THE BENEFIT OF GYPSUM FOR CROP PRODUCTION IN WISCONSIN

Francisco J. Arriaga^{1/} and Richard P. Wolkowski^{2/}

Abstract

Gypsum is a mineral whose chemical structure consists of calcium sulfate with two water molecules in its structure ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$). This mineral has been used in agriculture as a fertilizer for centuries, mainly as a source of calcium and sulfur. There are three main sources of gypsum available today for agricultural use: mined, recycled wallboard, and flue-gas desulfurization (FGD) gypsum. Chemically these sources are identical, with the exception of recycled wallboard gypsum, which might contain pieces of paper within the material. Currently there is considerable interest in FGD gypsum for agricultural use as it is readily available. Flue-gas desulfurization gypsum is generated in air scrubbers engineered to remove sulfur from exhaust gases in coal-burning electric power plants. This type of gypsum typically has a smaller particle size than mined sources; thus it dissolves and reacts more readily.

Several benefits are attributed to gypsum application to soil, other than supplying calcium and sulfur to crops. It is said that gypsum applied to soil works as a soil conditioner that improves soil structure, infiltration capacity, drainage properties, can improve nitrogen utilization of some crops, and reduce aluminum toxicity of the profile of acid soils. Further, FGD gypsum application to soil in specific has been proposed as a potential practice to reduce nutrients losses such as phosphorus. Research conducted in Wisconsin has mainly concentrated on the impact of FGD application to soil as an amendment and its impact on crop productivity, soil properties and phosphorus losses. The most recent data from research studies conducted in the State focusing on gypsum application to soil will be presented.

^{1/} Assistant Professor and State Soil Specialist, Dept. of Soil Science, Univ. of Wisconsin-Madison and Univ. of Wisconsin-Extension, 1525 Observatory Dr., Madison, WI 53706.

^{2/} Senior Scientist (Emeritus), Dept. of Soil Science, 1525 Observatory Dr., Univ. of Wisconsin-Madison, Madison, WI 53706.