

Comparison of Mined Gypsum Pellets and FGD Gypsum on Plant Productivity and Nutrient Uptake

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ABSTRACT

A study was conducted to compare differences between gypsum application from mined sources and FGD gypsum (FGD) on several environmental parameters. The study's objective was to address the fate of Hg and other RCRA metals in a common agricultural system and assess its mobility in shallow groundwater. We applied 0, 0.34, 0.84 and 2.42 MT ha⁻¹ FGD and mined gypsum pellets (PG) to 0.8 km long by 20 m wide plots with Yeddo/Ragsdale soils. The experimental was completely random with 4 replicates with three rates of each material and a control. Suction lysimeters were installed at 60 cm to high rate and control plots corn planting. Water samples were taken and analyzed for 32 elements, nitrate, ammonia, phosphate, sulfate, chloride and six herbicides. Atrazine and glyphosate were found in the water samples but below the MCL except one sample. Trace or no metolochlor, acetochlor simazine and alachlor were found. No differences among treatments were found. Trace amounts or undetectable levels of the RCRA elements were found in the water except for Hg which was detected at ppt levels. FGD had 200 ppt Hg compared to 0.1 ppt for PG and 26.1 for soil, little was found in the water. The concentration order was FGD<PG<control. Greater concentrations of chloride and sulfate were found in FGD and PG plots. Nitrate, ammonia and phosphate concentrations were not different. Water quality does not appear to be negatively affected by application of either FGD or PG at the maximum rate.