



Research Project: [Soil Hydrology and Management Effects on Erosion and Water Quality](#)

Location: [National Soil Erosion Research Lab](#)

Title: Assessment of Mercury in Soils, Crops, Earthworms, and Water when Soil is Treated with Gypsum

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Technical Abstract: Flue gas desulfurization (FGD) gypsum from fossil fuel combustion has many potential uses in agriculture, but there is concern about the potential environmental effects of its elevated mercury (Hg) concentration. The wet limestone scrubbing process that removes sulfur from flue gas (and produces gypsum) is also effective in removing Hg from flue gas. Mercury concentrations in gypsums, soils, crops, earthworms, and vadose water were measured in studies of gypsum as a beneficial soil amendment in Alabama (2 studies), Indiana, Ohio, New Mexico, North Dakota, and Wisconsin. Each study was designed using a standard protocol and involved a comparison of FGD gypsum with commercial (mined) gypsum each at three rates, plus an untreated control (0 rate) treatment. The gypsum rates varied in the different studies depending on the intended effects on soil properties. Mercury concentrations in FGD gypsum varied from 198 to 1332 ng/g (mean = 560 ng/g) and were one or more orders of magnitude greater than in the corresponding mined gypsum. Mercury concentrations in FGD gypsum were 7 to 39 times higher than in corresponding soil before treatment, while those in mined gypsum were lower than in corresponding soil before treatment except in New Mexico. Soil Hg was sometimes increased by FGD gypsum compared to the control treatment, but only the 66% increase for Wisconsin was statistically significant. Compared to mined gypsum and the untreated control, FGD gypsum increased Hg concentrations in plant tissue from a mixed (grass-legume) pasture in Ohio, but not in alfalfa in New Mexico and Wisconsin, wheat grain in North Dakota, corn grain or soybean foliage in Indiana, and bermudagrass or cottonseed in Alabama. Compared to the untreated control treatment, FGD gypsum increased Hg concentrations in earthworms by up to 40%, but none of the increases were statistically significant. If care is taken to remove as much mercury as possible during production of FGD gypsum, it seems mercury should not preclude the use of FGD gypsum as an agricultural amendment.

