

Mercury Release from Soils Amended with Flue Gas Desulfurization Solids

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Flue Gas Desulfurization derived gypsum (FGD) can be beneficial when applied as an agricultural soil amendment however concern has been raised regarding the release of mercury (Hg) from these materials to the environment. This work investigated Hg release to the air and water associated with soil from Indiana, Alabama, and Ohio amended with FGD in a laboratory setting. FGD was homogenized into each soil at rates of 4.5, 45, and 170t/ha and added at 4.9t/ha as a thin layer to represent a tilled and no-till agricultural setting, respectively. Data was also collected from unamended soils and those with applications of commercial gypsum. 24 hour Hg flux was measured from each material on a seasonal time step over one year. Water that had leached through a representative set of materials was collected seasonally and analyzed for total dissolved and methyl mercury. Perennial rye grass (*Lolium perenne*) was grown in a subset of soil treatments and Hg accumulation and flux measured.

Total Hg concentrations in the amended soils were similar to background soils and did not change significantly over the course of a year ($p=0.212$). Hg concentrations of leach solutions from the FGD amended soils were not different from those reported for US surface waters. Emissions from amended soils were higher initially relative to unamended soils however all fluxes became similar over time. Rye grass Hg concentrations were not related to amendment rate and were similar to values reported for foliage grown in uncontaminated settings.