

'Red mud' disaster's main threat to crops is not toxic metals

February 2 2011

As farmers in Hungary ponder spring planting on hundreds of acres of farmland affected by last October's red mud disaster, scientists are reporting that high alkalinity is the main threat to a bountiful harvest, not toxic metals. In a study in the ACS journal *Environmental Science & Technology*, they also describe an inexpensive decontamination strategy using the mineral gypsum, an ingredient in plaster.

Erik Smolders and colleagues note that a dam burst at a factory processing aluminum ore, flooding the surrounding land with more than 700,000 cubic yards of a byproduct termed red mud. At least 10 people died and hundreds were injured in Hungary's worst-ever environmental disaster. Red mud contains toxic metals like arsenic, chromium, cadmium and nickel. The mud also contains radioactive elements and is highly alkaline, caustic enough to burn skin and eyes. On the scale for measuring acidity or alkalinity, 7 is neutral, anything above 7 is alkaline and below is acid. Red mud is about one million times more alkaline than a neutral material. With up to 4 inches of red mud coating [farmland](#), concerns arose about red mud's potential impact on the 2011 planting of corn, alfalfa, and other crops. With little scientific knowledge about red mud's effects on plant growth, much of the concern focused on toxic metals.

The scientists' tests showed that plants in contaminated soil grew about 25 percent slower than crops grown in uncontaminated soil. The main culprit, however, appeared to be not [toxic metals](#) or radioactivity, but red mud's intense alkalinity and salt content. Adding gypsum to the red mud

can reduce alkalinity and will accelerate the removal of the salts, the scientists add, recommending long-term monitoring of metals in the crops to remove any concerns with food chain contamination.

More information: "The Red Mud Accident in Ajka (Hungary): Plant Toxicity and Trace Bioavailability in Red Mud Contaminated Soil"
Environmental Science & Technology

Provided by American Chemical Society

Citation: 'Red mud' disaster's main threat to crops is not toxic metals (2011, February 2)
retrieved 26 April 2024 from <https://phys.org/news/2011-02-red-mud-disaster-main-threat.html>

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