



Controlled-Release Fertilizers Using Zeolites

The U.S. Geological Survey (USGS) has experimented with zeolites to help control the release of fertilizer nutrients in soil. Zeolites are porous minerals with high cation-exchange capacity that can help control the release of plant nutrients in agricultural systems. Zeolites can free soluble plant nutrients already in soil, and may improve soil fertility and water retention. Because zeolites are common, these unique minerals could be useful on a large-scale in agriculture.

USGS research has experimented with zeolites applied to several different fertilizers including controlled-release nitrogen, controlled-release phosphorous fertilizers, and in the release of trace nutrients.

Controlled-release fertilizers were tested in greenhouse pot experiments with sorghum-sudangrass using NH₄-saturated zeolite (clinoptilolite) and P-rock with a phosphate application rate of 340 mg P per kg soil, and zeolite/P-rock ratios ranging from 0 to 6. Total phosphate uptake and phosphate concentration measured for the grass were related linearly to the zeolite/P-rock ratio, **and yields summed over four cuttings were as much as four times larger than control experiments.**