



Greater Harmony Between Agriculture and the Environment Reclaiming Wastewater through Soil Aquifer Treatment

Issue

Water-short areas in the U.S. and around the world have turned to reclaiming wastewater as a way to increase water supplies. Some treatment methods use chemical additives to help purify the water. Charles Gerba, a University of Arizona soil scientist, tested a more natural method currently used in Tucson, and found that it produced high quality nonpotable water without additives at a low cost.

What has been done?

The soil aquifer treatment used a 37-meter layer of soil as a filter. Wastewater was purified as it passed through, and was then collected in underground storage tanks. This is a natural, sustainable system that will not wear out. It takes the place of building a conventional treatment plant.

Impact

The soil aquifer treatment significantly reduced enteroviruses as they passed through the soil. Groundwater samples held no *Giardia*. The two organic compounds present were reduced by 92 percent and 85 percent respectively, and total nitrogen leached out 47 percent during recharge. The project has now expanded to include the City of Phoenix in Arizona, and Los Angeles and Orange Counties in California, at the request of those communities.

In Tucson, the project grew to include studies on using artificial wetlands as a pretreatment before soil aquifer treatment. At Tucson's Sweetwater Wetland and Recharge Facility the wetlands method reduced *Giardia* cysts and *Cryptosporidium* oocysts by more than 99.9 percent, and fecal coliforms and coliphages by 68 and 52 percent, respectively.

Funding

City of Tucson, American Water Works Association Research Foundation
U.S. Environmental Protection Agency (EPA)
Los Angeles County Sanitation District
Agricultural Research Service

Contact

Charles Gerba, soil scientist
Department of Soil, Water and Environmental Science
Shantz Bldg., Room 429
PO Box 210038
The University of Arizona
Tucson, AZ 85721
Tel: (520) 621-6906, FAX: (520) 621-1647
Email: gerba@ag.arizona.edu