Irrigating With Swine Wastewater Can Increase Crop Yields

Agricultural engineers Kenneth Stone and Joseph Millen collect bermudagrass hay for forage quality and nutrient analyses.

Bermudagrass hay crop yields were higher when irrigated with treated wastewater than bermudagrass crops irrigated with well water and amended with commercial fertilizer, according to a U.S. Agricultural Research Service (ARS) study.

However, the high nutrient content of wastewater from livestock can limit its use for irrigation, and spray irrigation can increase the emission of ammonia and other volatile organic compounds, according to an ARS news release.

Researchers Patrick Hunt, Ken Stone, and Matias Vanotti of the ARS Coastal Plains Soil, Water, and Plant Research Center in Florence, S.C., performed a 2-year study to see if subsurface drip irrigation with pretreated swine wastewater could eliminate emissions and increase effectiveness of irrigation, the news release says. The wastewater was pretreated to remove concentrations of ammonia, nitrogen, and phosphorus.

The study found that subsurface drip irrigation with treated wastewater reduces the amount of water draining through the soil, reducing the opportunity for nutrients to leach below the root zone, the release says. "These results imply that [subsurface drip irrigation] with treated swine wastewater provides forage crops with needed irrigation and fertilization that can equal — and even sometimes exceed — the benefits of feeding crops with commercial fertilizer," the release says.

After assessing the yield and biomass of the crop and measuring the nutrient levels in the soil and soil water, the scientists found that yields did not vary significantly when irrigated with wastewater that only replenished 75% of the water lost to evapotranspiration. "This suggests that wastewater subsurface drip irrigation is often effective at lower application rates," which reduces the amount of water needed for irrigation, the news release says.

Read more about this and associated research in the January 2009 issue of *Agricultural Research* magazine at www.ars.usda.gov/is/AR/archive/jan09/clean0109.htm.