

Turfgrass Irrigation with Municipal Effluent: Nitrogen Fate, Turf Kc Values and Water Requirements

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Goals:

- Determine the potential movement of organic contaminants and nitrogen contained in municipal secondarily treated wastewater used to irrigate turf.
- Develop information pertaining to this movement; how these contaminants can be managed to reduce the risk of groundwater pollution.
- Determine how effluent irrigation influences the water and nitrogen requirements of turf.
- Evaluate the evapotranspiration equations currently in use in the southwestern US.

Two weighing lysimeters have been installed at the University of Arizona Karsten Turfgrass Research Center for researching the consumptive water use of turf, nitrogen fertilizer loss through leaching, and solute transport through a fine sand soil profile.

Each tank is 13 feet deep and 8 feet in diameter, and has a soil-filled weight of approximately 99,120 lbs. Each tank has sampling ports in groups of five which are spaced at 120° intervals around the tank. These ports begin at the 3.3 foot depth (level) and are then positioned every 1.6 feet down to a depth of 11.5 feet. Tensiometers with pressure transducers, Time Domain Reflectometry (TDR) probes, and ceramic and stainless steel solution samplers have been installed, three at each level.

A single neutron probe access tube was installed in the center of each lysimeter. These devices are used for sampling soil water and monitoring soil moisture content. A Cardinal scale with an electronic loadcell measures changes in tank weight to ± 0.44 lbs (0.002" water loss or gain).

Land preparation and irrigation system installation was completed on the site. A dual irrigation system was used so that each lysimeter can receive wastewater or potable water. A wind speed shut-off switch and zero trajectory heads were installed to prevent drift. The lysimeter computer will also be able to shut the irrigation system off when a predetermined amount of water has been applied.