

Effluent great for turfgrass, study contends

TUCSON, Ariz.—After more than three years of study, University of Arizona agricultural scientists believe that municipal effluent is ideally suited for turf irrigation. The water is safe—for the turf and groundwater—and effectively produces golf course fairway-quality grass.

At the Arthur Pack Golf Course and Ocotillo Golf Course here and in Chandler, soil scientist Ian Pepper and plant scientist Charles Mancino proved that effluent irrigation must be managed differently. Higher levels of nitrogen, phosphorus and potassium in wastewater can reduce reliance on commercial fertilizer, particularly in the summer.

"Daily applications of effluent offer a built-in advantage," says Pepper. "It's like spoon-feeding nitrogen to the turfgrass."

He and Mancino compared soil samples

taken at depths of two and three feet on plots irrigated with effluent and potable water. They found that levels of nitrate-nitrogen, ammonia (which also contains nitrogen), potassium and phosphorus remained uniform, showing they posed no problem to groundwater.

In soil irrigated with effluent, sodium and phosphorus reached levels that warrant different management practices than customarily used. For example, reducing phosphorus fertilizer applications would allow the grass to use the nutrient contained in the effluent. And applying calcium sulfate or sulfur would reduce the sodium in the soil.

Mancino says turfgrass turning yellow (chlorosis) in the summer is the greatest problem resulting from effluent irrigation. An application of foliar iron takes care of

the chlorosis, but that's expensive. "It's an expense that municipal golf courses might not be able to carry," Mancino says. "Resort-owned courses should have no problem."

Except for its cost, municipal effluent is ideally suited for irrigating turf, Mancino and Pepper believe. "Irrigating turfgrass with effluent is an advantageous way to go, with good management—except for the high cost," Pepper says.

Most golf courses have their own wells, and irrigation water costs between \$40 and \$150 per acre-foot in this part of the country. In Tucson, buying effluent carries a price tag of about \$400 per acre-foot, and using drinking-quality water costs \$440.

For more information on their research, contact Mancino at (602) 621-1851 and/or Pepper at (602) 621-7234.

More contractors are renting equipment

CHICAGO—Since the 1986 tax reform and the loss of the Investment Tax Credit, construction contractors who use heavy equipment have increasingly turned to renting their machines.

Heavy equipment studies conducted in 1986 and again in 1990 by the market research firm of MacKay and Co. found that the number of owned and leased machines at work in the U.S. increased just 3 percent from 1986 through 1990. Rental machines more than doubled in number during the same period.

The survey was sponsored by Construction Equipment magazine, whose

editor Kirk Landers notes, "When investment tax credits were wiped out and

depreciation allowances reduced, the cost of owning high-ticket capital equipment went up substantially.

"When ownership costs go up, so does the liability for an under-utilized machine. From 1986 to 1990, a lot of equipment users just said 'no' to more liability. They made short-term rental commitments instead of long-term purchase or lease commitments."

Some of the machine types that are essential to the country's efforts to rebuild its transportation infrastructure have also aged since the tax reform.

"The average wheel loader in a highway fleet is more than eight years old," says Landers. "In 1986, a wheel loader that old would be scrapped or put into backup work. Today, the contractor replaces or rebuilds the machine's key components and tries to keep it working."

Heavy equipment trends

33 types of paving, lifting and earthmoving equipment

	1986	1990	%change
Rented	58,834	123,565	+110%
Owned/leased	643,496	660,210	+3%
Total machines	702,330	783,775	+11%

Source: MacKay & Co.

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