

By Steve Werblow

Treating it well

Wastewater treatment recycles our most vital resource

Water is far too valuable to be used just once. That's why water recycling, or reclamation, projects are growing worldwide, opening up new sources of precious, high-quality irrigation water for farmers.

The U.S. currently recycles 5 to 6% of its municipal wastewater—9 out of 10 of those recycled gallons flow in California, Florida, Arizona and Texas. Australia recycles 8% of its wastewater, and is aiming for 30% by 2015. Israel remains the world leader, recycling 75% of its wastewater and using it to supply half the nation's irrigation. Recycling allows Israel to use about 2 billion cubic meters (1.6 million acre-feet) of water each year from an annual supply of 1.3 billion cubic meters.

Every city and town must treat its wastewater and find a beneficial use for it, says Meni Ben-Hur of Israel's Agricultural Research Organization.

Israel matches water treatment to its use. Water for non-edible crops can undergo less treatment than water targeted to edible crops. Edible crops are also protected from contact with the treated wastewater.

Quality in. Israel also boosts wastewater quality by adjusting what goes into the system, Ben-Hur says. Soap makers developed boron-free detergents to eliminate phytotoxic B levels in irrigation water, and a national drinking water desalination project will lower salt levels in treated water. Some recycling systems are relatively simple. A Cargill Meat Solutions

beef processing facility near Wilroads, Kan., directs its process water through anaerobic settling ponds, then applies it to about 1,000 acres of corn silage and rye two to three miles away.

Agronomist Randy Waldren of Crop Quest in Top City, Kan., crop consultant on the project, says the odor-free water delivers a nutrient boost.

"We're getting 35 to 40 pounds of nitrate nitrogen and 45 to 50 pounds of phosphate," Waldren notes. That saves money on the crop side, and eliminates Cargill's need for costly nutrient removal that would be required prior to traditional discharge.

Waldren adds that sodium and chloride levels in the water run a little over 500 mg/liter, so an annual application of three to five tons of gyp-

sum per acre reduces SAR, or sodicity, helping preserve good soil structure.

Food crops require more thoroughly treated water. In 1986, Florida's City of Orlando and Orange County began deliveries of secondary treated wastewater—clarified, filtered and chlorinated—from their Conserv II project to 3,250 acres of citrus groves. Remaining treated water recharges the area's over-tapped aquifer.

The treated water is clean and clear—in fact, it doesn't leave a red-dish stain like local drinking water does, notes Jack Ross of Oakland, Fla.

Most important, the system has been farmer-friendly, he adds. The water arrives at a strong 45 psi, and the plant staff is responsive to irrigation and frost-protection needs.

Reliability includes quality as well as delivery, says Dale Huss of Ocean Mist Farms in Castroville, Calif., chairman of the Water Quality and Operations Committee for the 20-million-gallon-per-day Salinas Valley Reclamation Project.

Quality out. Decades of groundwater overdrafts let seawater intrude into Salinas' aquifer. To reduce well use, the Monterey Regional Water Pollution Agency designed a tertiary treatment system to supply irrigators.

The plant's filtration and chlorine disinfection systems eliminate 99.999% of the pathogens in the wastewater, a fact backed up by vigilant monitoring. "It's one of the safest water sources for irrigation in the world," says Huss. "It's probably the most inspected, test-



► **Large photo:** This reservoir in southern Israel stores treated wastewater for crop use. Re-using 75% of its water, Israel leads the world in wastewater reclamation. ► **Top inset:** Meni Ben-Hur says improving drinking water quality helps minimize the micronutrient and salinity levels in reclaimed water. That's made the water easier for farmers to manage. ► **Above:** Wastewater treatment plants supply half of Israel's crop needs.

ed water supply there is." And despite elevated salinity levels typical of treated wastewater, it's less salty than the threatened local groundwater.

"The quality is a lot better than what we were pumping out of the deep aquifer before," says Huss. "A number of our properties along the coast wouldn't be in farming at this point if it wasn't for this water." ■