



A Piece of the Puzzle

Transporting dairy compost helps in water quality solutions

Transporting dairy manure from Central Texas dairy farms and turning it into marketable, quality compost is a “piece of the puzzle” in finding solutions to improve water quality in the North Bosque River and Leon River watersheds.

Approximately 148 dairies with more than 98,000 cows operate in these two watersheds. Studies have shown that excess manure applications to land near dairies contribute to impaired water quality in the basin. High phosphorus levels in water can cause excessive growth of algae and other aquatic plants, which then rob the water of oxygen, leading to fish kills.

For the past three and a half years, Texas Water Resources Institute (TWRI), Texas Agricultural Experiment Station and Texas Cooperative Extension staff have helped composters produce higher quality composted dairy manure and market it to public entities. These researchers also educated the public in various counties on the many uses for composted

dairy manure and demonstrated applications within and outside the watershed.

These efforts significantly increased the quality, understanding, use and marketing of dairy manure compost, according to Cecilia Wagner, project manager for the TWRI/Experiment Station/Extension Dairy Compost Utilization project, which ended in April.

The marketing project is part of a larger plan developed by the Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB) to produce composted dairy manure to encourage the transport of dairy manure out of the watersheds.

Since 2000, the state board has provided incentive payments to commercial haulers to transport approximately 960,000 tons of raw manure from dairies to compost facilities, according to this project’s reports. About 450,000 cubic yards of compost from the watersheds were sold from that manure, with 71



percent exported out of the Bosque River watershed.

In a complementary program, TCEQ provided incentive payments to public entities to purchase dairy compost. In 2004, the incentive rebate payment was expanded to private agricultural producers and compost distributors through the Upper Leon Soil and Water Conservation District Compost Rebate Program. The rebate, offered through the Upper Leon Conservation District, led to the use and distribution of more than 3,000 cubic yards of composted dairy manure, Extension program specialist Wagner said.

Both programs were funded through a Clean Water Act Section 319(h) Grant from the U.S. Environmental Protection Agency and are scheduled to end August 2006 or when the incentive funds are depleted.

TCEQ provided funds to TWRI and Extension for the education and marketing component of the plan.

Extension worked with compost producers in the area to produce uniformly high quality compost. Because of the project, the majority of these dairy

compost producers have joined the U.S. Composting Council's Seal of Testing Assurance Program.

"Dairy compost producers' knowledge of sound production practices, record keeping and testing has vastly increased," said Dr. Mark McFarland, Department of Soil and Crop Sciences professor and Extension soil fertility specialist. "The quality and consistency of composted material improved substantially over the life of the project."

Through the application demonstrations, fact sheets, news articles and workshops, compost customers learned about dairy compost. In addition, the project contracted with Ron Alexander and Associates to help conduct marketing activities.

Extension conducted more than 15 dairy compost use demonstrations as part of the project.

In one demonstration, the Santo Independent School District in Palo Pinto County, working with Scott Mauney, Extension agent, and Dr. Jim McAfee, Extension turfgrass specialist, used dairy compost as part of a sports management plan to successfully

Dr. Cynthia McKenney of the Texas Agricultural Research and Extension Center at Dallas discusses the use of dairy manure compost to establish newly constructed landscapes at the center's annual turf and ornamental field day.



restore the district's football field. The density and amount of grass across the field increased and grass texture was softer than in years before.

Extension conducted other demonstrations in Comanche, Erath, Stephens, Coryell, McLennan, Somervell and Tarrant counties.

Practice verification studies refined recommended use rates of compost on common turfgrass varieties, landscapes, forages, and row crops. Additionally, Extension specialists evaluated soil and water quality following various dairy compost erosion control applications to ensure environmental sustainability.

In some of the verification studies, researchers evaluated non-traditional uses for dairy compost.

Researchers at the Texas Agricultural Research and Extension Center at Dallas evaluated using dairy compost to establish landscapes at new construction sites. Post-construction landscaping is usually approached from only the plant-selection viewpoint; and little effort is devoted to the severely disturbed soil, said Dr. John Sloan, assistant professor in the Department of Soil and Crop Sciences.

Following three years of data collection by Sloan and ornamental horticulturalist Dr. Cynthia McKenney, the Dallas researchers concluded that adding dairy manure compost during establishment improves the long-term performance of ornamental and turf plants typically used in new urban landscapes.

Sloan said that the increased performance is primarily due to the greater levels of soil fertility and improved soil physical properties, such as increased water infiltration and reduced soil compaction. The group recently received additional funding from TCEQ to continue the study for an additional three years in order to assess the long-term benefits of dairy manure compost.


Scientists with TWRI and the Blackland Research and Extension Center in Temple are also studying the use of dairy compost to help restore damaged training lands at Fort Hood. *(See Fort Hood story in this issue on page 2.)*



“These programs are all pieces in the puzzle to restoring and protecting the Bosque River Watershed,” Wagner said.

“We’ve seen the use of dairy manure compost increase in several markets,” she said. “While we have not seen the market develop to the extent desired, we believe, as with most markets, it will continue to grow with time.”

“Most importantly,” McFarland said, “results from these projects have increased tremendously our understanding of the most effective and environmentally sound uses of dairy manure compost and will support future growth and development of the composting industry both in the region and statewide.”

For more information on the project, visit <http://compost.tamu.edu>. 

As part of a verification study within the Dairy Compost Project, Extension staff monitor runoff from vegetated plots during simulated rainfall. Two different treatments—erosion control using a 50/50 mix of compost, and woodchips and application of inorganic fertilizer—were applied to the plots and the quality and quantity of the runoff water was compared.