

Santo ISD Utilizes Dairy Manure Compost in Sports Field Management

The Fighting Wildcats of Santo High School, Farm-to-Market Road 2201, Santo, TX played football on a field that was considered to be in "fair-to-poor" condition largely due to compacted soil and substandard turfgrass cover.

Scott Mauney, Palo Pinto County Extension Agent - Agriculture, Texas Cooperative Extension, offered his assistance to the school board in renovating the field. He contacted Dr. Jim McAfee, Extension Turfgrass Specialist in Dallas, and together they formulated a sports field management plan that included mechanical aeration of the football field, a top-dress application of dairy manure compost and commercial (nitrogen) fertilizer, timely applications of irrigation and efficient weed control practices.

As part of the Dairy Manure Compost Utilization Program, a project funded through a Clean Water Act Section 319(h) Grant by the US EPA through the Texas Commission on Environmental Quality, Santo ISD and Texas Cooperative Extension cooperatively demonstrated the use of dairy manure compost on the field. Further, Santo ISD was able to receive a \$5 rebate for each cubic yard of compost purchased.

The demonstration was implemented in May, 2004, when top-dress quality dairy manure compost was uniformly applied to the surface of the field at a rate of 80 tons per acre. Subsequently, the field was mechanically aerated to partially incorporate the compost, enhance nutrient and water uptake and to reduce compaction. As the season progressed, the field received two additional applications of 20 pounds per acre of inorganic nitrogen fertilizer and was mechanically aerated a second time.

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The treatments and timely maintenance resulted in better turfgrass coverage and uniformity. Improvements were noted in grass density, health, color, and overall appearance. Ray Hollis, Maintenance Supervisor with the Santo ISD, even noted that the football players liked the added cushion of the healthy turf stand, which aided in fewer injuries when falling during play.

Unfortunately, the condition of the field has again declined primarily due to overuse this last season. Athletes from a newly constructed school were temporarily reassigned to the Santo ISD field and it was also utilized by community soccer programs. The expectation is that with the addition of new sports facilities in the community, use of this field will again be largely limited to varsity sporting events and field health can once again improve.

It is at this point that the board expects their investment in the dairy manure compost application to pay dividends. The one-time heavy applications of compost are expected to improve chemical and physical properties of the soil, which will potentially hasten the recovery of the field from damage caused by overuse or other stresses such as climate. In addition, large compost applications can improve turfgrass health and optimize turfgrass response to fertilization, irrigation, aeration, and other management practices. Thus, standard fertilizer treatments and management practices (e.g. irrigation, aeration, etc.) can maintain the field for several years before re-treatment with compost is necessary.

Due to the positive results on the football field, the Santo ISD School Board considered a similar compost-fertilizer-management program for the baseball infield in 2005. However, plans to construct a new field were also under consideration. Thus, the board decided to delay the substantial investment of a dairy compost application until baseball field construction plans were finalized.

The costs of purchasing and hauling dairy compost can be substantial, especially for smaller school districts with limited budgets. Figure 1 is an example of the itemized costs associated with compost purchase and transport.

Compost Budget Sheet	
Compost (200 CY @ \$16.00/CY).....	\$ 3,200.00
Freight (50 Mi @ \$3.00/loaded Mi X 3 loads) ..	\$ 450.00
Sub-total (before rebate).....	\$ 3,650.00
Composted Manure Incentive Payment	
(Rebate of \$5.00/CY).....	-\$ 1,000.00
TOTAL COSTS.....	\$ 2,650.00

Figure 1. Estimated costs for the purchase and transportation of dairy manure compost. Costs are related based on a top-dress application on a football field at a rate of 80 tons per acre.

This example does not include the equipment and labor costs associated with compost application, which can also pose difficulty when utilizing compost. For example, compost spreaders were not readily available to Santo ISD but as part of the demonstration, TCE provided a small compost spreader. Mauney reports though that applying the 80 tons per acre compost treatment with the small research-type spreader required two people and nearly two days to accomplish.

The final question is will the school board realize the long term responses to the dairy compost applications they are anticipating? Research studies conducted at the Texas A&M Research and Extension Center at Dallas confirm that incorporation of dairy compost 6-inches deep into the soil does indeed provide such long term benefits. This and other demonstrations have

shown that dairy compost is a good source of nutrients that are released for plant use over time. When supplemented with periodic commercial fertilizer applications, specifically nitrogen, turfgrass responses (growth, color, density) are typically better than those obtained following only commercial fertilizer use. Long term improvements in soil physical and chemical properties, however, are less likely to result from surface applications than from incorporation of dairy compost into the soil.