Turfgrass Research, Education and Extension Endowment

2006 progress reports for 2005-2006 funded projects

Fate of carbon and nutrients in warm season turf with and without composted biosolids, N, and return of clippings.

Scientists: Dai, Vietor, Schnell, Proven, White, Hons and Boutton

Funding: $5,000

Municipal biosolids (MB) are applied to land as a soil amendment and fertilizer. There is potential to use MB through either through soil incorporation or topdressing to improve soil physical and chemical properties during turf establishment and maintenance. This research quantified MB impacts on amended Tifway bermudagrass sites compared to sites not amended with MB. Characterization of MB evaluated the fate of soil mineral nutrients and organic carbon, fertilizer nitrogen and return of clippings. Comparisons were made between sprigged plots amended with 25% by volume of composted MB versus those without MB. Both were sprigged to Tifway bermudagrass. Variables studied included monthly nitrogen fertilizer, inorganic fertilizer amendments (N-P-K), and an unfertilized control. Aggressive periodic soil sampling allowed for data collection on the impacts of MB in the turfgrass system. Researchers summarized the work by stating " although some trends have been identified over the 9 months of sampling, continued monitoring is needed to evaluate the dynamics of soluble organic carbon, dissolved organic carbon, total N and P...in relation to management of composted MB, fertilizer N and clippings."

Summary: This research provides characterization of how MB impact establishing turfgrass systems. It is basic work that is necessary to explore potential benefits of MB if they are to be considered for use in turfgrass systems.

Evaluation of transplanted sod for cycling of composted municipal biosolids.

Scientists: White, Vietor, Munster, Provin, Dai, and Chalmers

Funding: $4,961

Topdressing or incorporation of volume-based rates of composted municipal biosolids (CMB) is often recommended to enhance turf establishment on excavated or disturbed soils.Yet, one concern associated with this practice is to prevent transport and runoff loss of CMB nutrients. Use of CMB as a soil amendment or in CMB amended transplanted sod will reduce requirement for P fertilizer since P is contained in CMB. Researchers evaluated phosphorus and nitrate nitrogen runoff from CMB (Dillo-Dirt) amended Tifway bermudagrass. CMB had positive impact on speed of sprig establishment and sod harvesting at a depth of 3/4 inch removed 31% of the P originally incorporated CMB to a depth of just over 3 inches. CMB amendments enhanced physi-

cal properties of soil and sod that are relevant to sod value (water capture, reduced dry and wet weight of harvested sod). Runoff losses from CMB amended sod were compared to non-amended sod for losses of N and P forms in surface runoff.

Summary: Use of CMB in turfgrass sod has potential as a best management practice. Results will quantify potential positive and negative aspects of CMB use in sod production by measuring nutrient cycling, runoff and nutrient transport with harvested sod.

Improving nitrogen recommendations for turfgrass.

Scientists: Hons, Provin, White, and Shahandeh

Funding: $4,800

Industry standard practices regarding turfgrass nitrogen fertilizer relies on nitrogen fertilizer programs for application rate, timing, frequency and seasonal amounts. These programs are usually based upon grass species, use and desired quality. Soil test results for nitrate nitrogen are used in other crop systems to provide credit for soil nitrate nitrogen levels in making nitrogen recommendation from a soil test. This research attempts to better understand nitrate soil test nitrogen levels and associated turfgrass response. Research plots were established on zoysiagrass and St. Augustinegrass to evaluate changes in soil nitrate over time, to evaluate the availability of residual soil nitrate for turf uptake/use and to evaluate turfgrass soil test report nitrogen recommendations bsed upon soil nitrate levels. The grasses were fertilized in February 2006 with 0, 1/2, 1, 2 and 3 LBS actual nitrogen (as calcium nitrate) per 1000 sq ft. March 2006 soil test results in St. Augustinegrass for soil nitrate nitrogen ranged from 5.8 ppm (parts per million) for the unfertilized treatment to only 8.6 ppm for the 3 LB N treatment. The identical treatments in zoysiagrass ranged from 5.7 to 6.0 ppm soil nitrate. Lack of soil test nitrate rate related separation ranges were attributed to leaching resulting from high rainfall plus malfunctions that resulted in excess applied irrigation. Late June nitrogen applications to zoysiagrass had strong correlations between nitrogen application, soil test nitrate nitrogen, and turf color/growth.

Summary: The research improved understanding of the relationship between residual soil nitrate from soil testing and turfgrass nitrogen fertilizer recommendations.

Evaluation of long term drought survival in San Antonio of established turfgrass species and cultivars.

Scientists: Havlak, Chalmers, White and Thomas

Funding: $4,000

This funding was used to purchase a soil moisture sensing apparatus to quickly measure decline in soil moisture in the sponsored research study - “The Evaluation of Sixty-Day Drought Survival in San Antonio of Established Turfgrass Species and Cultivars.” which began in July 2006. The intent was to use the probe to monitor declining mois-

ture in the early stages of drought. We discovered the instrument's three inch probes were most useful in soil that is only has modest moisture stress so its use in the study was limited. It lead the research team to directly evaluate plot moisture from one representative turfgrass variety from each species by volumetric soil moisture taken from cores at 0 to 4; 4 to 8, 8 to 12 and 12 to 18 inch soil depths. These measurements were taken 0, 20, 40 and 60 days after initiation of drought. The unused surplus above the $1850 purchase price, earmarked for labor in taking measurements, was returned to the TREEE account. We plan to make use of this instrument in other studies.

Development of insect resistance in St. Augustinegrass.

Scientists: Reinert and Engleke.

Funding: $5,000

Turfgrasses, like other plants, have a collection of genetic resources in their make up which is referred to as "germplasm". The St. Augustinegrass (SA) breeding program, based at TAMUS-Dallas, has used number of different types of SA parents to generate new hybrid SA for further evaluation. Identifying desirable genetic traits is extremely important to this process. This research characterized germplasm from the SA improvement program along with existing commercial cultivars for their potential resistance or susceptibility to the southern chinch bug, a particularly troublesome insect pest of SA. All 10 commercial cultivars to were found to be highly susceptible, including Floratam and FX-10, which had been known as possessing high levels of chinch bug resistance. SA cultivars generated in the Dallas breeding program were also evaluated for resistance or susceptibility to the southern chinch bug. There were 23 elite SA genotypes found to be highly susceptible to damage. However, four advanced hybrid SA lines produced 66 to 83% mortality of the confined chinch bugs within seven days.

Summary: Southern chinch bugs in Texas have overcome resistance in Floratam and FX-10 St. Agustinegrass. This study has identified strains of SA in the Dallas SA breeding program that have the potential to be used develop a good chinch bug resistant cultivar. A cultivar of St. Augustinegrass resistant to the Southern Chinch Bug is an economical and environmentally sound pest management strategy.

Professional development opportunities in turfgrass management for County Extension Agents in central Texas.

Funding: $1,850

Scientists: Havlak

Texas Cooperative Extension County Extension Agents (CEA) have interaction with the turf and landscape industries. Twenty CEAs met in San Antonio and visited three farms (Bladerunner Farms, the Other Side, and Turfgrass America) in the Poteet area. During the tours, the agents learned about the sod business and issues affecting it. They observed planting, maintenance and harvesting equipment, and fields of various varieties

of grass. John Cosper, TPT Executive Director, visited with the agents concerning water issues and how agents can and need to be involved in regulation making processes being undertaken by cities and water purveyors. In addition to Havlak, Dr. David Chalmers and Dr. James McAfee assisted with the training program.

Summary: Texas Cooperative Extension County Extension Agents in Agriculture, Natural Resources and Horticulture are often asked for recommendations on home and commercial landscape issues. This training provided CEAs the opportunity to better understand turfgrass sod production and grass selection.

Evaluating herbicidal control of three problematic weeds in Texas.

Funding: $5,000

Scientists: Grichar, Havlak, McGuill, Lopez, and Taylor.

Acceptable control strategies have not been worked out for three problematic weeds found in Texas turfgrass systems; K.R. Bluestem, Texas panicum and Sprangletop. This project evaluated herbicidal control for each of these weeds with varied seasonal (fall 2004, spring & fall 2005 and spring 2006) using multiple herbicides alone and in combinations. Each of the three weeds were studied at different Texas locations known for infestations. Turfgrass injury from applied herbicides was also evaluated. The fall 2005-06 drought impaired further seasonal work with K.R. Bluestem. The most effective postemergence herbicides resulted in weed growth reduction or seed head suppression. The most effective control for K.R. Bluestem was using MSMA at 2.65 pt/acre alone or using sequential applications 10 to 21 days apart. Other combinations of MSMA + Image, MSMA + Sencor, MSMA + Drive, MSMA + Monument and MSMA + Revolver resulted in some stand reductions. Sprangletop control was marginal with preemergence herbicides during fall-winter 2005-06; the best control rating was only 47%. Sprangletop postemergent herbicide control was marginal with herbicides that did not result in significant turf injury. Texas panicum control was greater than 90% with Asulam, sequential applications of MSMA and combinations of MSMA with Sencor, MSMA + Drive and MSMA + Monument.

Summary: Researchers found the best of the herbicide control strategies rated “fair” at best for K.R. Bluestem. Sprangletop postemergence control remains difficult as well.