REDUCE/REUSE/RECYCLE YARD WASTE IN PINELLAS COUNTY

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Abstract. In maintaining home landscapes, residents of Pinellas County produce enough yard waste during the growing season to account for a significant amount of the daily sanitation pick up. The Florida Solid Waste Management Act of 1988 mandated each county reduce the amount of solid waste generated by 30% by the year 1994. Realizing vast quantities of yard waste were being generated in Pinellas, a county yard waste mulch project was initiated. A yard waste composition study was carried out to determine suitability of grinding equipment. Yard waste was collected both curbside and at drop off centers, then taken to the processing area where it was ground. The processed yard waste was then moved to the windrowing site. Windows were monitored for temperature, oxygen, moisture levels and pesticide/herbicide residues. After 45 days, the finished weed-free, pathogen-free product as ready for public distribution around the county.

In 1988, the Florida Legislature passed the Solid Waste Management Act which has a goal that each county reduce the amount of solid waste generated by 30% before the end of the year 1994. In maintaining home landscapes, residents of Pinellas County produce enough yard waste during the growing season to account for a significant amount of the daily sanitation pick up. An analysis of the waste stream indicated that 22% was yard waste and land clearing debris which represented approximately 260,000 tons per year.

The total amount of solid waste generated in Pinellas County is over 1,200,000 tons per year. This large volume of waste can be significantly reduced by implementing yard waste recycling programs. These efforts include: residential on-site grass clipping recycling, backyard composting and mulching as methods of recycling yard waste. For residents not wishing to recycle yard waste on-site, municipal yard waste to mulch projects is a viable option. Landscape maintenance by-products not only can be removed from the municipal solid waste stream, but they can be turned into mulch for use by residents, park services, government and commercial horticulture enterprises. Landscape contractors and home gardeners utilize mulch for functional and aesthetic purposes. Mulch applications provide the additional benefits of:

1. decreasing water evaporation from soil  
2. helping prevent soil erosion loss by wind or water  
3. helping control weed invasion

The Pinellas County Yard Waste Recycling Program was located at the county landfill and utilized 4.25 acres. This project is a cooperative effort between the City of St. Petersburg Sanitation Department, Pinellas County Cooperative Extension Service, the University of Florida Institute of Food and Agricultural Sciences (IFAS), the Pinellas County Department of Solid Waste Management and ten cities.

The yard waste processed at the county project is collected by both curbside collection systems and drop off centers. The project accepted yard waste from cities that had separate yard waste and trash collection. City-wide...
segregated curbside yard waste collection from single-family dwellings was carried out a minimum of once a week. The most common vehicle used is a rear loading compaction truck and yard waste was debagged at the curbside. Acceptable material size of yard waste was limited to 6 inches in diameter and 6 feet in length.

To create the most cost-effective end product, a mulch production processing was chosen. Yard waste was converted into mulch as a result of the chipping and shredding action performed by the mobile tub grinder. The Jones "Mighty Giant" tub grinder utilizes a high speed rotating hammer mill powered by a 400 HP diesel engine. This grinder is a self-loading machine and becomes mobile when pulled by a truck tractor. The grinder is equipped with a 28-foot hydro-fork that loads wood waste material into the tub grinder. The tub rotates to assist feeding the material into the hammer mill. The production of this machine will vary between 8 to 20 tons of processed materials per hour.

This equipment makes use of several screens to obtain a desired product size and consistency. Each change in screen size directly affects the production rate of the grinder. Smaller screen size results in a lower production rate per hour. The grinding process demonstrates a minimum volume reduction of 33% the original volume.

The processed yard waste was then moved from the grinding area with a Model 624 John Deere front-end loader with a 3.75 cubic yard Tink bucket and a 40 cubic yard roll-off truck. The ground yard waste is placed in windrows 24' wide, 10' high and 120' long. Each windrow is estimated to contain 300 tons of ground materials. The site contained a maximum of 16 windrows or a total windrow capacity of 4,800 tons. It was noted that, over time, mulch decomposes and becomes more dense allowing between 20% to 50% more tons in the same amount of space.

The determination of when to turn a windrow was dependent on the microbial environment within the pile. Active microbes generate temperatures needed to render weed seeds and pathogens nonviable. Adequate moisture and oxygen are necessary to maintain a healthy aerobic microbial environment. To ensure weed seed and pathogen destruction within a windrow, studies indicate a minimum average temperature of 131 degrees Fahrenheit must be maintained at a 3 feet of depth for 3 hours after windrow formation, Stinson et al., (1990). If a temperature reading for a given windrow fell below 110 degrees Fahrenheit or rises above 160 degrees Fahrenheit, windrows were turned and irrigated. Weed seeds that survived at one foot depth were destroyed by mixing into the core at the time of rotation. Windrows received two rotations at two-week intervals resulting in a 45-day rotation cycle. If the oxygen content for a windrow indicated less than 5 percent, this was considered an adequate basis to incorporate further oxygen back into the windrow. When windrows became extremely dry (less than 20% moisture) they were irrigated. Moisture was added to the windrows manually by utilizing fire hoses or naturally by rainfall. To maximize efficiency, windrows were irrigated at the time of windrow turning. These conditions were considered essential during mulch production and prior to the finished material being transported to a stockpile area for future utilization.

Efforts were taken to closely monitor windrows throughout processing. The main objective of the monitoring and quality control efforts was to serve as means of evaluating process and product variables necessary for establishing a product which can be effectively utilized for market opportunities. In order to accomplish this goal, samples of the mulch product were sent out for laboratory analysis. Data collection and evaluation took place on freshly processed and cured mulch. To ensure a safe product, mulch was tested for pesticide/herbicide residues. Chemicals selected for testing include those which may contribute to ground water contamination or have been found to be persistent in the soil, such as organochlorine compounds, organophosphate compounds, hydrocarbons, soil fumigants, chloracetamides, dinitroanilines, phenoxyis, thiacarbamates, and triazines. Lab analyses indicated insignificant or no detectable levels for those pesticides and herbicides tested. The nutrients considered in the analyses were nitrogen, phosphorus, potassium, calcium, magnesium and the soluble salts. Carbon/nitrogen and pH analysis were also carried out.

**Results and Discussion**

According to the Florida Solid Waste Management Act of 1988 (Florida Statute, Chapter 88-130) after January 1, 1992, yard trash will no longer be considered for disposal in lined municipal landfills. Utilization of yard waste as a landscape mulch has proven to be one viable use of this product. To date, the Pinellas County Yard Waste Recycling Program has processed 26,271 tons. The finished mulch product has been used for erosion control, soil stabilization, plant bedding mulch and dust control on trails and parking lots (Ashworth and Harrison, 1983; McConnell and Stinson et al., 1990).
Shiralipour, 1990). A public awareness and educational campaign was used to create an awareness of recycled yard waste mulch and its value. To reach the greatest number of people, a multi-media approach was utilized to disseminate educational information and materials to the public as they relate to yard waste recycling. Some methods of dissemination of information to the public were television and video, newsletters, news articles, brochures, seminars, learn-by-mail series and displays and exhibits.

Public awareness and educational efforts resulted in seventy-five percent of total tonnage being distributed to governmental agencies, parks and recreation areas, highway, municipalities, local nurseries, and golf courses. Recycled yard waste mulch was also marketed for residential landscape use. A countywide free mulch program was initiated with nineteen distribution sites for self-loading. Usage at these sites ranged from 3 to 5 tons a week, approximately 26% of the end-product distribution. A 1991 survey of Pinellas County residents indicated that 74,880 home landscapers have used Pinellas County recycled yard waste mulch (Suncoast Opinion Surveys, 1991). Efforts continue to expand both the commercial, municipal and residential markets for recycled yard waste mulch.

**Development and Implementation of a Landscape Learning Center for Dade County**

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**Abstract.** Dade County residents with horticultural questions often visit the Dade-IFAS Cooperative Extension Service office in Homestead. The original landscape was installed sometime after the building was completed in February, 1969. By 1989, the landscape had gone into a state of decline, with Bauhinia roots buckling the pavement in the parking lot and Schefflera leaves causing the roof to decay. Dade County agents met several times with a landscape architect to develop plans to renew the landscape and to develop a Landscape Learning Center based on the concept of grouping plants with similar characteristics and similar water requirements together. In October 1989, the existing landscape was cleared and prepared for replanting. Planting beds received a topdressing of 6" of a sludge-yard trash co-compost prior to planting. Local nursery growers donated all of the planting material for the Landscape Learning Center. Once plants were installed, 3-4" of shredded yard trash was used as mulch. The new Landscape Learning Center contains the following areas: (a) landscaped area, (b) palm area, (c) native plant area, (d) bamboo planting, (e) mixed tropical and subtropical fruit grove, (f) pine hammock, and (g) patio planting. Plaques have been erected on each planting site so visitors can view the area on a self-guided tour.

Many of the landscapes in Dade County are not well maintained. One reason for this is a lack of knowledge as to which plants can be grown successfully in Dade County. Local residents often lack knowledge or experience in appropriate irrigation and fertilization techniques and insect and disease control measures. Both old and new residents are confused about landscape maintenance. Many conflicting sources of information, such as gardening books written for more temperate areas, are used rather than those developed for southern Florida conditions. Different sites around Dade County provide opportunities for residents to learn more about plants, but most are designed for purposes other than instruction.

Sixty percent (60%) of all the water used by Dade County residents is for landscapes. An informal sampling of the more than 60 phone calls received by the Dade-IFAS Cooperative Extension Service every day indicates that at least one-third of homeowners do not understand how plants grow and that they tend to confuse the relationships among soil, water, air, light, fertilizers and pesticides. They do not know or practice basic principles of lawn care and variety selection. Phone calls and discussions of plant problems with walk-in clientele indicate that pesticides are often used in a haphazard fashion with little realization of their possible adverse impacts on the environment.

The objective of this project was to establish a Landscape Learning Center (LLC) on the 5 acre site of the Dade-IFAS Cooperative Extension Service Office where local residents could observe the wide range of plant material which is available to them as residents of southern Florida. The LLC was envisioned as an ongoing demonstration of how plants can grow to be attractive specimens if proper pruning and installation techniques are used early in a plant’s life even if little follow up maintenance is used.

**Development, Design and Establishment**

**Design.** The Project Coordinator, whose primary extension clientele is the landscape maintenance industry, with

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1Adams, Bruce. 1989. South Florida Water Management District, West Palm Beach, Fla. Personal communication.