



## Construction of Home Compost Units<sup>1</sup>

Roger A. Nordstedt and Anne W. Barkdoll<sup>2</sup>

The 1990 average statewide generation of municipal solid waste (MSW) in Florida was 8.3 pounds/person-day, 1.5 tons/person-year, or 19.4 million tons per year in Florida (FDER, 1991). This was considerably higher than the national average of 3.6 pounds/person-day estimated by the U.S. Environmental Protection Agency.

Surprisingly, MSW in Florida contains only 15% yard trash compared to 20% for the U.S. Yard waste is defined as vegetative matter resulting from landscape maintenance and land clearing operations and includes tree and shrub trimmings, grass, palm fronds, leaves, trees and stumps. MSW disposed in every Florida county must be reduced by at least 30% by the end of 1994, and no more than one-half of the 30% goal may be met through the recycling of yard trash, white goods, construction and demolition debris (C&D), and tires. Also, by the end of 1994 a majority of the newspaper, aluminum cans, glass, and plastic bottles must be separated from the MSW stream prior to final disposal at a solid waste disposal facility. These must be offered for recycling to complete the 30% recycling goal.

Of the 19.4 million tons of MSW generated in Florida in 1990, 15% was recycled, 16% was combusted in waste to energy plants, and 69% was disposed in permitted landfills. Landfill construction and closure activity has been extensive in the past year, but the costs are very high. Beginning in 1992, yard waste can no longer be disposed in lined

landfills. Because yard waste is a large part of the waste stream (15%), composting and mulching are becoming important in meeting the 30% recycling goal. There are currently 14 counties in Florida with composting projects in operation or under construction. Most of these are for yard trash. When yard waste is banned from landfills in 1992, there will undoubtedly be many more composting and mulching projects in operation.

### RECYCLING YARD WASTE

There are two approaches to recycling and reducing yard waste. The first is to reduce the amount of yard waste set out for curbside collection by encouraging the use of yard waste in the home landscape or garden. The second approach is to set up large county operated composting and/or mulching facilities to process yard waste which has been picked up at curbside or delivered to the facility.

It is recommended that yard waste be reduced and/or used in the home landscape. For example, grass clippings can be left on the lawn or used in the garden. Leaves can be mulched with a lawn mower or shredder and used in the garden or landscape. Yard waste can also be composted.

Some large, woody yard waste may not be readily used in the home yard. Although mechanically powered chippers and shredders are available, they are too expensive for many homeowners. However,

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2. Roger A. Nordstedt, associate professor; Anne W. Barkdoll, post doctoral associate, Agricultural Engineering Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.

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they are available for rental in some communities, and the cost can be minimized by cooperating with neighbors who also have a need for this equipment. Thus, some type of large-scale facility will probably be needed in most communities for some yard waste and for tree surgeon and land clearing debris.

Whenever yard waste can be utilized in the home yard, it should be encouraged. If composting is the method of choice, it can be accomplished in a number of ways in different types of compost units. These units can be manufactured units or can be constructed by the homeowner.

### **FACTORS TO CONSIDER IN SELECTION OF COMPOST UNITS**

Regardless of whether the compost unit is purchased or built by the homeowner, there are several factors to consider in choosing the type of compost unit:

1. aesthetics or appearance
2. quantity of material to be composted
3. likelihood of problems with rodents
4. cost
5. labor requirements
6. skill level required in building
7. skill level required in operating
8. desired time for composting

The appearance of the unit may be very important in some areas, either because of the homeowner's wishes or because of deed restrictions or other limitations. As a matter of fact, in some areas it is either illegal or a violation of deed restrictions to have a home compost unit. Units which have been constructed from wood or masonry can be painted or stained to match the decor of the house or to blend into the landscape.

Many of the home compost units are too small for some homeowners. For example, the small barrel units with a capacity of 30 or 60 gallons are too small for people with large quantities of material to compost. Many of the barrel units are also difficult to turn when the yard waste has been reduced in volume and is very wet. Another limitation of the barrel units is that their volume is not large enough to effectively retain heat produced in the composting process. Hence, they do not achieve the necessary temperatures for weed seed destruction. However, they will still produce a composted material over a

longer period of time. Some of the larger barrel units can achieve the higher operating temperatures.

Manufactured compost units, such as the wire bins, can be purchased for approximately \$40. However, some of the large turning barrel units may cost over \$300. Most of the manufactured compost units are available for approximately \$100. Compost units can generally be constructed by the homeowner for considerably less cost. Some compost units are relatively easy to build, and others require a considerable amount of carpentry or masonry skills to construct.

Rodents or other wild and domestic animals may be a problem in some areas. In those cases, the compost unit should be enclosed and secure. Bin units without a sturdy cover would not be considered satisfactory.

In general, compost units which will provide compost in the least amount of time are also the ones which require the most management. They will require more frequent turning and more attention to the proper proportions of materials which are placed in the compost unit.

### **MAKING YOUR OWN COMPOST UNIT**

There are at least as many different ways to construct a compost unit as there are people who build them. If you decide to build a compost unit, the first step is to decide which type of unit is best for you. Eight of the more important factors to consider were discussed above.

Ideas for constructing your own compost unit can be obtained from various sources. Many of your county extension offices have composting demonstration projects with homemade compost units. Most of the manufactured compost units which you see in manufacturer's literature or in magazines will suggest ways in which to build your own unit. Many organizations, magazines, or state extension offices also have information available (Dickson et al.; Nordstedt et al., 1991).

### **TYPES OF COMPOST UNITS**

Compost units can be classified in several ways. They can be classified into "holding units" and "turning units". Holding units include bins which have been constructed from masonry, plastic, wood, wire, or combinations of these materials. Most of the

manufactured bin units are plastic or wire. Turning units include barrels which are turned horizontally or end to end.

### **Holding Bin Units**

This is the most popular type of home yard compost unit. The simplest and least expensive type of bin compost unit can be constructed from wire fence material. If you can obtain it, snow fence works quite well. Consider using the vinyl coated fence wire which is now available at building supply stores. You may also want to consider splitting the cost of a roll of wire with neighbors or friends. The length of wire which is needed for a circular unit will be approximately 3 times the diameter of the bin. The ends of the fence can be wired together or a steel rod or post can be used to permit quick disassembly for removing the compost or for turning the composting material.

Wire bins can also be square or rectangular if corner posts and/or other side support is provided. Wood or steel posts can be used. Unless extensive side support is provided, these units can be unsightly. Because of the large amount of open area on the sides and top of these units, they may dry out very easily. They may also accumulate excessive water in rainy weather. Because of this, some manufacturers of wire bins now sell plastic liners with some holes for aeration. A cover should be added if animals or excessive rainfall is a problem.

Bin units can also be constructed from lumber or landscaping timbers. Although these units are more expensive than the wire units, they can be made to be very attractive. Units made from landscaping timbers can be constructed similar to a log home, and they can be painted or stained to match the decor of the home and/or landscape. Some attractive units can also be made by using lattice panels in wood frames. Dimension lumber can be used to construct panels, sometimes with slanted side boards to permit aeration.

A very inexpensive bin unit can be constructed by fastening four wood pallets together at the corners with wire or posts (wood or metal). A fifth pallet can be used for a top if security is likely to be a problem.

Bin compost units can also be constructed from concrete blocks. A nonpermanent unit can be made by stacking the blocks and driving steel posts through the holes and into the soil. The blocks can also be

mortared or fastened together with surface bonding materials. Gaps can be left between the ends of the blocks ( $\frac{1}{2}$  to  $\frac{3}{4}$  inch) for aeration, or some of the blocks can be turned on their side to achieve the same effect. The concrete block units can be very attractive if they are painted to match the decor of the house or the landscape.

The bin composting units should be at least 3 feet wide, 3 feet long and 3 feet high. Larger volumes will work even better because of better heat retention. These units can also be made in two or three bin units to facilitate turning of the composting material, particularly if one bin is not large enough to handle the yard waste.

A simple bin compost unit can also be made from large metal or plastic trash cans. The only modification required is the drilling of aeration and drainage holes. Although these units are limited in capacity and do not retain heat well, they are easily mixed by emptying the unit and refilling it.

### **Turning Units**

The turning units will produce compost more quickly than a holding unit, if they are intensively managed. However, the volume of many manufactured units is not large enough to effectively retain heat or to handle the waste from many yards. Plastic barrels are most commonly used to make turning units. They are available in many places that handle mineral oils, detergents, etc. Caution should be exercised to avoid using barrels that have contained hazardous or toxic materials.

Barrel compost units can be turned on either the vertical or horizontal axis. Steel pipe and pipe flanges are convenient ways to mount the barrels on supports made from wood or concrete block. Some barrels will have a large screw on lid for loading and unloading. A door can be made on other barrels by cutting a hole in the side or end and using a piano hinge and a latch. Holes should be drilled in the barrels to provide aeration and drainage of excess water.

### **SUMMARY**

There are many different ways to construct a home compost unit. The requirements and limitations of the yard and the homeowner should be carefully considered prior to beginning construction. Construction of a home yard waste compost unit can be a rewarding and beneficial experience, and it can

help to reduce the solid waste problem in our communities.

### REFERENCES

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