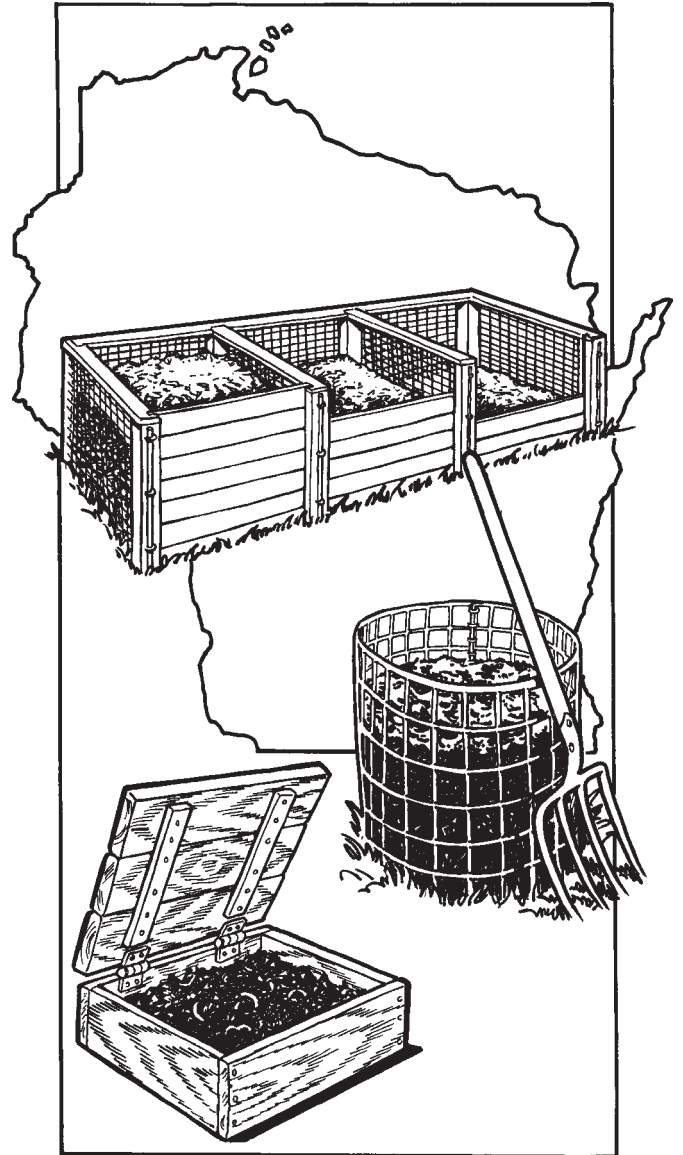


Home Composting

The Complete Composter



Wisconsin Department of
Natural Resources

PUBL-SW-182 93

Wisconsin's Recycling Law

In recent years, as much as 30% of all household trash generated in Wisconsin consisted of yard wastes. That's 300,000 tons of leaves, grass clippings, and other biodegradable, compostable materials sent to landfills and incinerators each year.

Yard wastes in landfills contribute to methane gas and leachate which pollute the air and local water supplies. And the high moisture in yard wastes causes them to burn poorly in incinerators, raising pollution levels and operating costs.

That's why, as of January 1993, state law bans yard wastes — leaves, grass clippings, garden debris, and twigs, brush, and branches six inches in diameter or smaller — from landfills and most incinerators. This law does not apply to stumps, roots or shrubs with intact root balls, or incinerators which burn solid waste to recover energy.



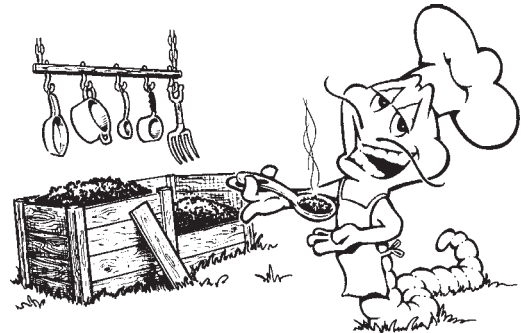
A Burning Issue

Another popular method of leaf and brush disposal — backyard burning — pollutes the air, creates a fire hazard, and is a nuisance to neighbors. State air quality and fire control rules restrict backyard burning, and many communities prohibit it entirely. When possible, try to reuse or compost materials you used to burn.

In This Brochure...

You will find detailed information for “advanced” composters. If you have mastered the information on basic composting, and are ready to move on to new challenges, this brochure is for you.

Compost Systems. page 4
“Cold” and “Hot” composting systems-
which approach is better for you?



Food Scrap Composting. page 5
When and how should food scraps be
composted. Includes information
on soil incorporation,
“hot” composting, and
vermicomposting
(worm bins).



Piles, Pits, Bins and Barrels. page 7
What composting bin design will work for
you given the amount of space, time, and
attention you can give to composting?

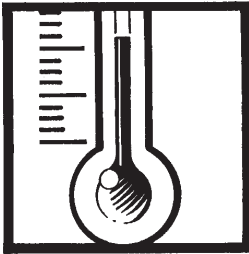
Commonly-Asked Questions. page 17
Answers to commonly-asked questions on
weather, pesticides/herbicides, odors, pests,
composting pine needles and oak leaves
and other potential composting problems.

Cold Composting

“Cold” composting is the easiest way to reduce yard wastes. A cold compost pile is basically a storage pile for yard wastes.

A cold compost pile decomposes very slowly and requires no turning. New material is added to the top of the pile; there is no need to mix it in. Cold compost can take 1-2 years to create finished compost.

In a cold compost pile, grass clippings should be mixed with other bulky materials to keep odors from developing. Because cold composting involves slow decomposition and less turning (aeration), it is *not* recommended for composting food scraps.



Cold composting is ideal for a household that needs to manage material, has enough space to allow material to sit for 1-2 years, and wants to put minimum work into managing their yard waste.

Hot Composting

A “hot” compost pile rapidly breaks down yard wastes. Decomposition is caused when the right combination of carbon and nitrogen in yard wastes interact with bacteria, water, and oxygen. This chemical reaction can heat the pile’s center up to 170° F or more.

Hot compost piles require frequent mixing, or “turning,” to allow air to circulate throughout. A hot pile can make humus (finished compost) in 6-8 weeks.

Hot composting is ideal for a household that needs to manage yard waste, has limited space for a compost pile, wants a finished product in a short amount of time, *and* is willing to actively work the material. Food scraps *can* be added to hot compost piles at the time the material is turned, or buried 8-10 inches into the center of the material. Many communities regulate composting food scraps. *Always* check with your local community before composting your food scraps.



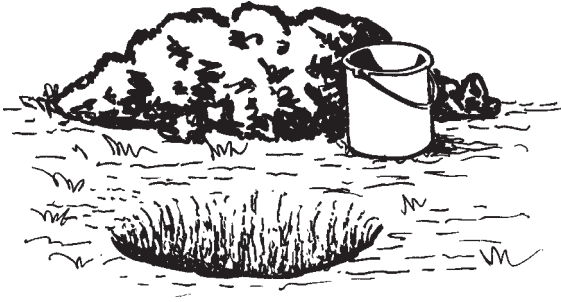
Food Scrap Composting

Food scraps may be composted in three ways: incorporation into the soil, “hot” composting and worm bins.

In many communities there are public health ordinances which regulate food waste composting. *Always* check with your local community before attempting to compost your food scraps.

Soil incorporation

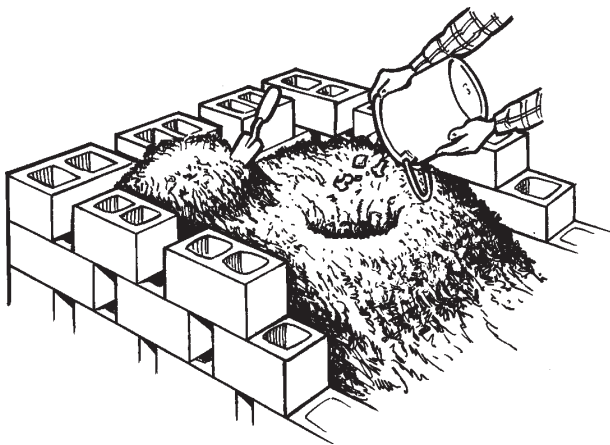
Soil incorporation is the simplest method of composting food scraps. Dig a hole or trench, chop the food scraps and mix them into the soil, and then cover them with at least 8" of additional soil.



DO NOT bury foods such as meat, bones, dairy products, or oils. They will attract animals and other pests.

Hot composting

Food scraps should only be added to *hot, active* compost piles. Always mix them into the *center* of the pile (buried 8-10 deep), not on top. Add only uncooked vegetable scraps, never scraps containing oils, meats, bones, or dairy products. Keep the pile enclosed in a bin to help keep out animals.



What food scraps can I compost?

Do compost:

fruits and vegetables, including apples (peels and core), cabbage, carrots, celery, coffee grounds, eggshells, grapefruit, lettuce, onion peels, orange peels, pears, pineapple, melon rinds, potatoes, pumpkin shells, squash, tea leaves, tomatoes, and turnip leaves.

Do not compost:

dairy and meat products, including butter, bones, cheese, chicken, fish scraps, lard, mayonnaise, meat scraps, milk, sour cream, and yogurt. Do not compost foods containing oils or fats such as peanut butter, salad dressing, margarine, and vegetable oil.

Piles, Pits, Bins and Barrels

"The Pile"

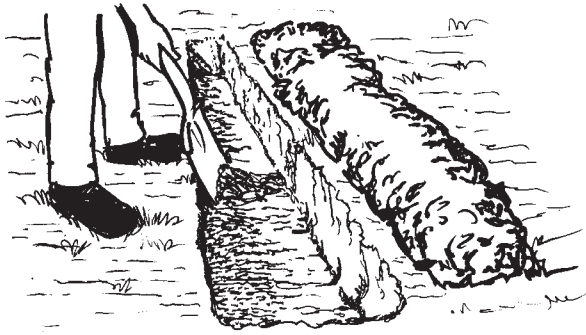
The pile is not a structure, however many people like using this easy composting method. Pile leaves and grass into a corner of the yard and let nature do its work. Normally the pile will take 1-2 years to completely decompose. To speed things up, chop up leaves with a lawn mower and turn the pile occasionally (once or twice a year) with a pitchfork.

Too much moisture or green material (grass clippings) may cause odor problems. To minimize odors, mix in some leaves or bulky organic material and turn the pile more frequently to let air inside. The pile is a cold composting method with little or no turning required. **DO NOT ADD FOOD SCRAPS!**

“The Pit and Trench”

Pit and trench composting is useful for gardeners and is frequently done right in their garden or next to their garden plot. This is a easy compost method requiring no turning.

Dig a pit about 2-4 feet deep. Add in yard wastes, including garden debris, throughout the summer. Surround the pit with chicken wire and plant tomatoes, cucumbers, or other heavy feeder plants around the outside of the wire. At the end of the summer, when the garden is done, cover the pit with 1-3 inches of soil. Next spring plant the garden as usual locating the pit in a different part of the garden. Before covering with soil, food scraps can be added.

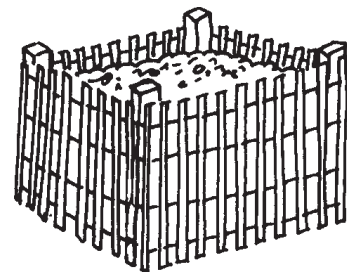


The trench is a variation of the pit. Dig a trench 18 inches deep. The trench can be located in a garden or next to a garden. Fill the trench with leaves, grass, and garden debris throughout the summer. At the end of the summer, when the garden is done, cover the trench with 1-3 inches of soil. Do not add food scraps until you are ready to cover the trench.

Snow fence bin

Bins made with prefabricated snow fencing are popular because they are simple to make and easy to move and store. To build this bin, buy the appropriate length of prefabricated fencing (a 64 cubic foot bin would be 16' long and 4' high), and fasten two-by-fours to the corners to form a stable square bin. A bin 4' x 4' x 4' (64 cubic feet) will ensure the compost pile will remain active during the winter months.

A snow fence bin is a cold composting structure with little or no turning required. **DO NOT ADD FOOD SCRAPS!**

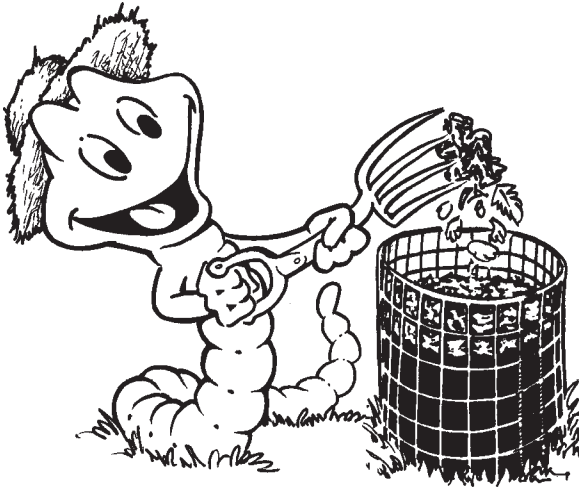


Woven wire bin

This simple, economical bin requires only a length of woven wire fencing and a few minutes of time to construct. Multiply the diameter of the compost heap by 3.2 to get the length of fencing to buy. Fasten the ends with wire or three or four small chain snaps (available at hardware stores) to make a circle. To turn the material in the bin, simply open the bin up, move it, and turn the material back into the bin at its new location. To make the bin more stable, attach the sides to posts. To ensure the compost pile will remain active during the winter months it should have a surface area of 16 square feet with a 4' height.

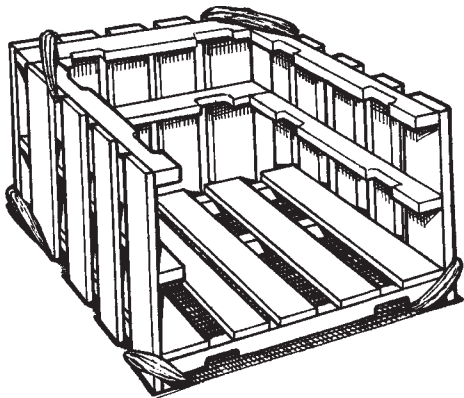
A woven wire bin can be either a cold or hot composting structure. If no turning is

done, DO NOT ADD FOOD SCRAPS! If material is turned frequently, food scraps may be added as the pile is turned.



Wooden pallet bin

Old wooden pallets are an inexpensive, readily available building material. Pallets can easily be wired together to form a bin. In areas where the soil is a heavy clay, consider using a pallet to form the bottom of the bin and keep materials up off the ground for better drainage. Construct bins with removable fronts or sides so that yard materials can be easily turned with a pitchfork. Wire mesh can be substituted for



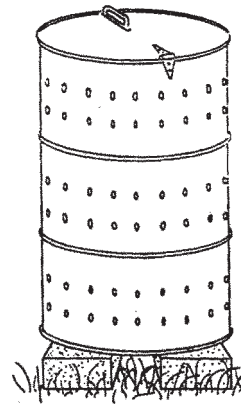
wooden sides to increase air flow. Covered bins allow convenient protection from pests and heavy rains.

A wooden pallet bin can be either a cold or hot composting structure. If no turning is done, DO NOT ADD FOOD SCRAPS! If material is turned frequently, food scraps may be added as the pile is turned or buried 8-10 inches into the pile.

To make the structure more attractive consider painting the bin with an outdoor latex paint or plant climbing plants around the outside of the bin.

Barrel/drum composter

A barrel or drum composter generates compost in a relatively short period of time and provides an easy mechanism for turning. This method requires a barrel of at least 55 gallons with a secure lid. Be sure it was not used to store toxic chemicals.



Drill 6-9 rows of 1/2 inch holes the length of the barrel to allow for air circulation and drainage of excess moisture. Place barrel upright on blocks to allow bottom air circulation, and fill 3/4 full with material.

Every few days, turn the drum on its side and roll it around the yard to mix and let air into the compost. This compost structure is totally enclosed and if frequently turned food scraps *can* be added. The compost should be ready in two to four months.

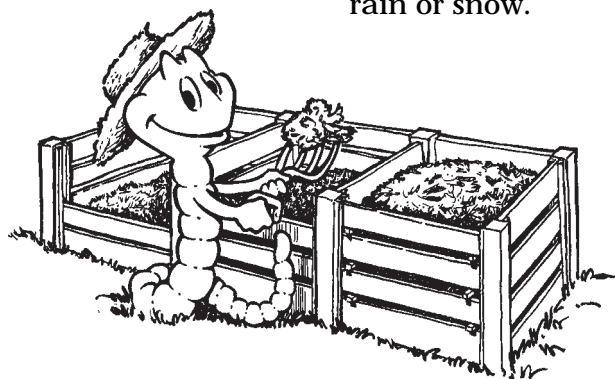
This is an easy system for city dwellers where there is a small amount of material.

There are a number of other designs for barrel/drum composters. This design is one of the easiest to construct at home. Because of the small size of the structure, yard materials in the drum will usually not remain actively through a Wisconsin winter.

Three-chambered bin

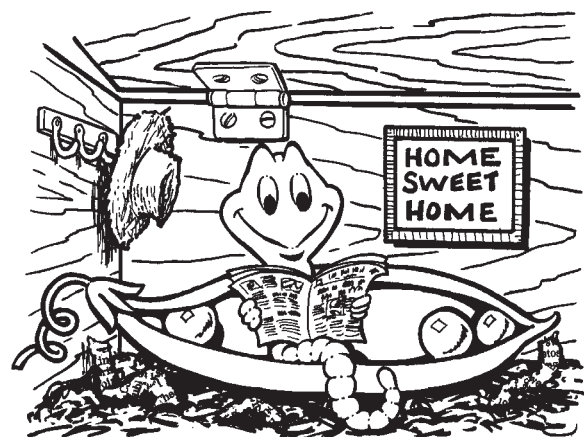
This efficient and durable composter yields quick results. It works like an assembly line with three batches of compost in different stages of decomposition. Material is started in the first bin and allowed to decompose for 3-5 weeks. Then it is turned into the middle bin for another 4-7 weeks. The material in the middle bin is turned into the third and last bin as finished or nearly finished compost. New material is started in the first bin each time it is emptied.

This structure should be made from rot-resistant wood such as cedar or redwood; arsenic free treated wood; plastic lumber; or metal or wooden posts and wire mesh or hardware cloth. Each bin should be approximately 3-5 feet wide by 3-5 feet high. Removable slats in the front and between bins offers complete access to the contents for turning. Another design option is making the fronts removable doors rather than wooden slats. Plastic or hardware cloth can be used to make tops for shedding heavy rain or snow.



This is a hot composting structure you can add food scraps either by mixing them in when you turn material from one bin to the next*, or it can be buried 8-10 inches deep into a bin.

*Since food scraps are generated daily, this would require very frequent turning.



Worm bins

Using worm bins (vermicomposting) is a fun and easy way to compost food scraps. Worm bins utilize redworms (not earthworms) to eat food scraps and turn them into worm castings — a useful garden fertilizer.

Worm bins are commonly made from simple wood boxes with lids. Put worms in the box with shredded, moistened newsprint or corrugated cardboard. A good rule of thumb for sizing the box is to build one square foot of surface for every pound of food waste generated per week. One of the easiest boxes to build is called the 1-2-3 box — sides are 1 foot high, the box is 2 feet deep from front to back, and 3 feet wide from side to side (6 square feet surface

area), with aeration holes in the bottom and a simple covering of black plastic over the top. A box this size will handle about 6 pounds of food scraps per week.

Drill air holes in the bottom of the box and keep a lid on top to keep the box dark and moist. The worms will not leave the box as long as it is kept moist and there is plenty of food available. Optimal temperature for worm bins is between 50°-75° F. Do not let the temperature drop below this level or the worms will die! Some people keep their worm bins in the basement. Others prefer a spot under the kitchen sink.

Worm bins are usually kept in the house to assure the worms don't get too cold or hot. However, during the summer the bin can be kept outside in a shaded location. If the bin is outside for the summer it should be off the ground to keep bugs out of the bin and for better drainage during heavy rains.

Redworms may be purchased at bait shops



or other stores which sell fishing supplies. Be sure to purchase redworms and not earthworms or other worm varieties. They consume their own weight in

food each day! (Other types of worms eat less.) Redworms are only about 2 to 4 inches long when full grown, and are not native to Wisconsin.

Making a worm home

Once the worm bin is built, shred newspaper (not the colored sections) into 1 1/2 inch-wide-strips until you have about 10 pounds of shredded newspaper. Mix the prepared newsprint with about a gallon of garden soil (preferably a silty loam soil). The soil provides grit for the worm's gizzard. Add to the soil and newspaper mixture about 4 gallons of water to make the worm environment about 75 percent moisture. Other materials that can be used to make worm bedding are corrugated cardboard or compost. The worms will eat the bedding material, compost, and soil, as well as your food scraps.

Feeding your worms

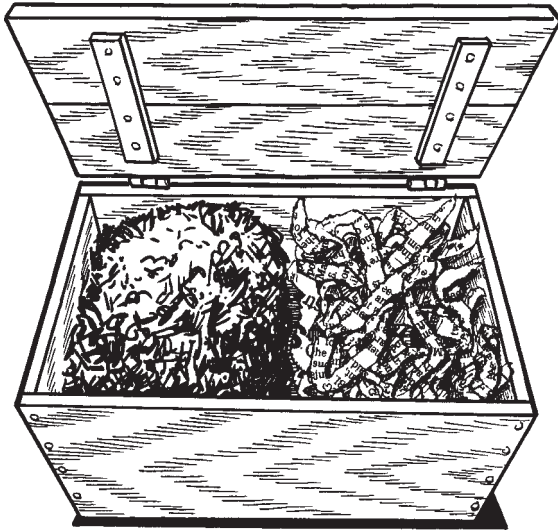
Once you add the redworms to their new home, you can start feeding them your food scraps! They will eat lettuce leaves, apple cores, potato peels, watermelon rinds, coffee grounds, citrus rinds - the list is long. Avoid dairy and meat products, oils, and oily foods because these foods can cause odors and attract animals and insects.

Add food scraps to the worm bin by digging a hole in the bedding at one corner of the bin and burying the scraps in the bedding. The next day, bury the scraps at the alternate corner of the bin and move down the sides of the bin alternating sides every day. Some people simply add food scraps to the top of the bedding. This method works, but it can cause odors. If your bin gets ripe, simply add more bedding material to the bin. Add some fresh bedding at least every two months.

Harvesting your compost

As the worms eat their way through the materials in your bin, the contents of the bin darken and begin to smell moist and

earthy. This is the vermicompost (worm compost), your finished product. Vermicompost is full of nutrients necessary to promote strong, healthy plant growth. You have some of the richest potting soil in town!



There are a couple of easy ways to harvest your vermicompost. One way is to carefully move the finished compost to one side of the bin, and fill the empty side with fresh, moist bedding material. Give the worms 4 or 5 weeks to move over to the new bedding materials, and then remove the finished vermicompost.

Another method is to put a can filled with food scraps into the finished compost. Punch holes in the sides and the bottom of the can large enough for the worms to enter. In 4 or 5 weeks the can should be filled with worms. the finished compost can be removed from the bin without the worms. Remember to refill the bin with fresh, moist bedding material.

Using worm compost

Worm compost (vermicompost) is a rich soil enhancer. It contains many nutrients

needed to grow strong, healthy plants both in your house and in your garden. Some of the ways it can be used:

- Mix with peat moss, garden loam, vermiculite or sand to make potting soil.
- Sprinkled on your houseplants soil as a top dressing.
- Spread 1 inch thick on the surface of your garden.
- Added by the handful when you transplant vegetable plants in your garden.

Commonly-asked questions

What is compost?

Compost is a rich soil-like mixture that is produced when organic materials break down. Compost is a soil conditioner or amendment consisting of decayed organic matter. Compost increases soil organic matter, improves soil physical properties, allows for greater plant root penetration, and supplies a minimum amount of the essential nutrients for plant growth.



What is composting?

Composting is the process that uses microorganisms, moisture and oxygen to convert plant materials such as grass clippings, leaves, and other organic materials to compost, a more usable organic soil amendment.

What is mulching?

Mulching is using unprocessed yard waste as a soil cover around plants, shrubs, trees, and leaving grass clippings on the lawn to enhance moisture retention and suppress weed growth. Yard waste mulches include grass clippings, leaves, wood chips, pine needles and bark.

What is yard waste?

Yard waste is leaves, grass clippings, yard and garden debris, and brush no greater than 6 inches in diameter. Included as yard waste is raw garden vegetable plants, tree seeds, pine needles, weeds, flowering plants, seeds, small woody materials, and pine cones.

When should I start my compost pile?

The best time to start is in the fall when you have access to both leaves and grass. A pile started in the fall should be ready to use by early spring. In warm weather, a well-managed hot pile (turned every 7-10 days) will be ready in 6-8 weeks.

Do compost piles freeze in winter?

Compost piles smaller than 4'x4'x4' can freeze during winter. Freezing will make hot piles inactive but will not harm your compost. Larger piles remain active but should not be turned during winter.

How does composting fight plant diseases?

The high temperatures in a well managed compost system (131°+ F for three consecu-

tive days or more) will kill most plant diseases. Like a vaccine, the dead diseases appear to help plants resist similar diseases.

Why are pet wastes not acceptable to use in compost?

Pet wastes from cats, dogs, meat eating animals and birds contain pathogens (disease organisms) which can be transmitted to humans. Stabilized, commercially-processed manure from grass-eating mammals does not have pathogens which can be transmitted to humans, and can be used in compost.

Can I add pine needles to my compost?

Pine needles are high in acid and resin and have a small size, which can make them difficult to compost. These make a good mulch for acid loving plants such as lilies of the valley, blueberries,



raspberries, blackberries, roses and conifers. The best use of pine needles is to leave them under the pine tree where they fall. Pine needles condition the soil and protect the shallow root system of their parent tree.

No more than 10 percent of a mixed yard waste pile should be pine needles. Some gardeners compost pine needles separately for their acid loving plants. Composting pine needles separately can cause an odor problem because their small size reduces the amount of oxygen in the compost pile.

Can I add oak leaves to my compost?

Oak leaves are acidic and slow to decompose. The compost process is a great neutralizer. Once oak leaves are composted, the finished compost will have a pH close to neutral. To help oak leaves break down



faster in a compost pile, consider using your lawn mower to chop them into finer pieces before adding them to your pile. This will expose more surface area to the microorganisms and speed up the compost process.

Can I use agriculture lime on my compost pile?

Many people like to use lime on their compost piles to “sweeten” it and reduce the acidity of the pile. This isn’t usually necessary. The compost process helps to neutralize acid materials, resulting in a neutral pH in finished compost. Lime can tie-up nitrogen in the compost pile and may cause slow composting.

Can I add toxic weeds or plants to my compost pile?

Many of the native plants and weeds in Wisconsin that produce toxins (black walnut leaves, nightshade, monkshood, etc.) can be added to your compost pile.



The compost process will neutralize the toxin so the finished compost is safe to use in your gardens and houseplants. However, these plants should *not* be used as mulch (without prior composting). To identify a specific plant and see if it is toxic, check with the local library or the local county extension agent before adding it to your compost pile or use it as mulch.

Where should I put my Compost Pile?

Here are some guidelines on where to locate your compost pile:

- Out of direct view.
- Within reach of water with a garden hose.
- Protected from direct winds.
- In a spot with good drainage.
- Away from wooden structures to eliminate heat and moisture damage from the composting process.
- Away from residential structures where neighbors might be offended.

What if I don’t have enough materials to start a compost pile?

Sometimes you will end up with too much of one type of material, and not enough of another. Here are some suggestions for balancing out your compost pile:

Not Enough Grass: You will need to add another nitrogen source to your compost. Add a 2-inch layer of livestock manure, or 1 cup of 10-10-10 fertilizer per 25 square feet of top surface area with a 3 foot depth.

Not Enough Leaves: Grass is a high source of nitrogen and is small in size and easily compacts. Grass *must* be mixed with some bulking material such as wood, leaves, plant stalks or chips to provide a carbon source and allow air to circulate through the pile. Composting grass without a bulking material can create a strong ammonia smell.

Adding lime to correct a grass-based odor problem is only a temporary solution, and lime often ties-up nitrogen from the grass clippings. Your best bet: go with a bulking agent instead.

Does a compost pile require a license or approval?

Check with your local municipality to see what backyard compost rules need to be followed. For example, some communities don't allow backyard composting of food scraps. Only compost piles exceeding 50 cubic yards a year require an approval or license from the DNR.

Will the compost pile smell bad?

It shouldn't. A properly-tended pile won't create unpleasant odors. Turning the pile to add oxygen should end an odor problem quickly. Finished compost has a faint, slightly sweet smell.

Will the compost pile attract animals?

You might see animals around your compost pile if you are composting food scraps improperly. Food scraps should be buried 8-10 inches into the center of a hot compost pile. **DO NOT** compost food scraps in a cold pile, or throw food scraps on top of your compost pile at any time! Animals will come around if you supply them with an easy food source.

What happens to pesticides when they are composted?

Pesticides include herbicides (weed killers), fungicides (fungus killers) and insecticides (insect killers). *Most* pesticides which are *currently available* to homeowners are degradable organophosphates. The active ingredients in most pesticides usually break down in 6-8 weeks.

Grass clippings or weeds treated with pesticides can be safely mixed into a compost pile or mulched back onto your lawn.

WARNING: Uncomposted grass and weeds treated with pesticides should not be used

as a garden mulch. Pesticide treated yard materials don't know the difference between plants and insects you want to keep and weeds and bugs you want to kill.

References

This brochure is designed to answer some of the common questions people have about composting and yard management. If you are interested in more information on the topics discussed in this brochure, check with your local library for the following publications:

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Other Resources:

For more information on composting or DNR yard waste regulations, contact your municipal recycling staff, a county extension agent, or a DNR district recycling specialist.

Other yard waste management brochures available from DNR are:

PUBL-SW-072 92REV, *Home Composting: Reap A Heap of Benefits*

PUBL-SW-073 92REV, *Yard Care: Do Your Share!*

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