

COMPOSTING FOR IOWA COMMUNITIES



Iowa Department of Natural Resources



Many Iowa communities are looking for ways to handle the grass clippings, leaves and tree wood trimmings generated by their citizens. Since 1991, Iowa has prohibited yard waste from being deposited in landfills. Many Iowa communities are managing yard waste conveniently and economically, with little impacts on the environment.

IOWA LAWS PERTAINING TO YARD WASTE MANAGEMENT

Yard waste collection program requirements- Local government in Iowa must offer a yard waste collection program such as curbside collection or drop off sites.

Yard waste compost facilities - If a community is interested in operating a compost facility, here are the major requirements:

Permitting

A full description of requirements can be found in Iowa Administrative code 567 chapter 105(455B, 455D). The operator of the facility must use best management practices and notify the Iowa DNR in writing before operations begin. The notification must include:

- Location and legal description of the facility
- Landowners name, telephone number and mailing address
- Name, phone number and address of the responsible party
- Annual capacity of the facility
- Method of composting to be used
- Source of yard waste and any bulking agent to be used.

Setback distances

When siting a new facility, it must be located:

- 500 feet from any existing inhabited residence
- 200 feet from public wells
- 100 feet from private wells
- 100 feet from flowing or intermittent ponds, streams, lakes or rivers.

Surfaces

Composting facilities require all-weather surfaces allowing accessibility during bad weather and able to support maintenance equipment. Some examples of appropriate surface materials include:

- Compacted soil or clay
- Compacted granular aggregates
- Concrete
- Asphalt
- Compacted asphalt millings

Signs

Iowa law requires a sign to be posted at the composting facility stating:

- Name of operation
- Hours of operation
- Materials accepted or a sign with the message "All materials must have prior approval."
- 24 hour emergency contact number for a responsible official

CHOOSING YOUR COMMUNITY'S YARD WASTE MANAGEMENT STRATEGY

Land application offers an alternative for managing yard waste without the costs and other resources necessary for composting or community education. It also provides benefits for area farmland.

Land application can be an inexpensive and immediate alternative, but can be challenging for greater quantities of materials. It is most suitable for communities with farmland nearby. The material needs to be free of contaminants such as yard waste bags, stones, brush and trash.

Application of yard waste can be accomplished with typical farm equipment; however, some experimentation

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may be necessary to determine the best application rates and methods. Leaves and grass clippings are simply spread on agricultural land and plowed or tilled under the soil.

Many Iowa communities contract with local farmers for areas to apply yard waste. Be sure to adhere to contracts and agreements made with those landowners. Keep in mind the following three best management practices:

- Keep yard waste out of waterways
- Prevent yard waste from leaving the land application site
- Work to prevent odor problems by spreading out materials and not applying too much in a given area.

Iowa law limits the amount of materials that can be land applied to two dry tons per acre per year. A complete description of Iowa requirements regarding land application is available in Iowa Administrative code 567 chapter 121 at www.iowadnr.gov/Environmental-Protection/Land-Quality/Solid-Waste

Creating a compost facility

Composting is one of the most economical and environmentally friendly ways of managing yard waste. Good quality compost which can be used for improving soil quality or gardening purposes, can be developed with a community proactively controls the composting process.

Compost Benefits

- Improves soil conditions
- Decreases chemical fertilizer needs
- Adds organic material and water retention capability to the soil
- Reduces erosion and runoff
- Suppresses weeds

GETTING IT TO WORK

Oxygen levels

The microorganisms that break down yard waste require oxygen to live. To provide adequate oxygen in your compost, be sure to turn the piles frequently in the beginning to keep the pile under 160 °F and less

frequently in the winter to keep temperatures up. Not turning the piles can cause odor problems.



Temperature

To begin the composting process, maintain a temperature of at least 131 °F in the piles for 15 consecutive days, with materials turned at least five times during the 15 days. Monitor and record

temperatures every 75 feet along compost piles. If the pile temperature goes above 160 °F, it needs to be turned. A compost thermometer can be purchased on the internet.

Moisture

If moisture in compost piles is too low, materials will not break down. Lack of moisture also leads to a greater risk of fire. If too much moisture exists, it can cause odor problems.

Monitoring moisture levels can be done inexpensively. Simply test by hand following these three steps:

Take a handful of material and squeeze –

- If water drips out, the material is likely too wet and needs to be turned or have some drier material added.
- If the material feels dry, water may need to be added.
- Compost material should feel like a moist sponge.



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Carbon and Nitrogen – Managing your “Greens and Browns”

Carbon and Nitrogen are primary elements that organisms use for food. If carbon is too high, microorganisms cannot grow and composting will not occur. If nitrogen is too high, ammonia will develop and cause odor problems. Because of these issues, it is important to have the right balance in the compost pile.

1. Brown materials: leaves and Tree trimmings

Leaves tend to compost well and contain moderate moisture. Wet leaves may need to be spread out and dried before composting to prevent odor problems. Conversely, dry leaves may require water be added to the pile. Tree trimmings can be beneficial in your compost as bulking agent; however, limit the amounts of woody materials since they decompose slowly.

2. Green materials; grass clippings

Grass and other green wastes should not be composted alone, since they tend to mat down and may cause odor problems. Moisture is rarely a problem with grass clippings.

Preparing your site

If your community had decided to compost, here are a few tips and considerations for planning and operating the facility. Remember to first review the legal requirements listed above.

Facility Size

When choosing a site, it should be large enough to accommodate all incoming yard waste. Use the following factors to estimate the size of the facility.

- At least one acre for every 6,000 cubic yards of waste, which is about 900 tons.
- Drop-off and unloading area
- Storage area for finished compost.

Water runoff

The facility must be designed to prevent water run-off and to avoid formation and discharge of leachate which is the liquid that seeps through decomposing organic material. Any leachate that forms must be treated as wastewater in an appropriate treatment facility.

Composting surface and signs

Yard waste facilities require all-weather surfaces and appropriate signs. See requirements above.

Equipment

Mixing and turning compost piles can be accomplished with a front-end loader, a bucket-loader on a tractor, or equipment with similar capabilities. A very small facility may only need one tractor or loader to keep the compost turned.

Collecting materials to compost

Communities are required to offer either curbside collection or drop off sites for citizens to dispose yard waste.



Curbside

collection- is convenient for residents and often results in the most yard waste for composting, but is also more costly. Bags or yard waste stickers are often provided for sale by the facility at local retailers and other convenient locations.

Drop off sites are less expensive to operate, but require transporting by residents. If the drop-off location is at the facility, be sure traffic directions are well marked.

Composting facilities that are a significant distance from residents may consider a more centrally located drop-off site. Be sure to transport yard waste materials from the site frequently to avoid odor and other problems. All material should be checked for litter and illegally dumped materials.

Managing the compost pile

Fall is the ideal time to start a composting facility because leaves cause fewer odor problems and can be blended later with grass materials in the spring.

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Windrows



A windrow is a long pile of compost that is usually trapezoid shaped with the base of the windrow two to three times wider than its height. Putting compost in windrows is often the

easiest and most economical way of managing the piles. Materials should be mixed before windrowing to help the composting process and prevent odor. The windrows can be constructed using a front-end loader or a truck with a dump box. Most windrows end up being about 16 to 18 feet wide, six feet tall, and any length. However, a windrow can be just as effective with smaller dimensions to fit the location's size and needs.

Curing

After several months, yard waste materials enter the curing phase and are allowed to sit with little or no turning. Materials that are curing should be kept separate from new materials brought in for composting. Finished compost will closely resemble soil and will be reduced to 25-50 percent of its original volume. The facility should have areas for curing and storing finished compost. Compost is ready for use after 12 to 18 months from the beginning of the process.

What to do with the Compost

Most small compost facilities have three attractive options for using finished compost.

- CITY USE – the finished compost material is an excellent, free alternative for cities to use in community gardens and parks, and to reduce erosion at construction sites.
- GIVE IT AWAY – the facility can offer free compost or sell compost to farmers, residents and businesses. Compost is an eco-friendly material that can be a major benefit for local environmental protection efforts.
- LAND APPLY- -compost can be land applied to help improve soil quality and prevent run-off.

- If you sell compost, you must register with the Iowa Department of Agriculture and Land Stewardship (IDALS), Feed and Fertilizer Division at 515-281-8599.

Windrow tips and trouble shooting

- ☑ Turn the windrow at least weekly at the start of the process or whenever temperature in the pile rise above 160 °F
- ☑ Windrows should be turned less frequently in the winter to maintain heat and more frequently in the summer to avoid odor. In the winter, turn the pile after it snows to add moisture. Spring means lots of grass, so plan to turn more often at that time.
- ☑ Windrow size can affect the rate of composting. A pile that is too large may emit more odor due to poor aeration in the center of the pile.
- ☑ Enough space should be left between windrows for equipment to move and mix materials.
- ☑ Adding bulking agents such as dry wood chips can help avoid odor problems.

Learn More:

Iowa State university extension offers information on composting:

Midwest Composting School -

www.uwsp.edu/wist/Pages/Midwest-Compost-School.aspx

Composting yard waste -

www.extension.iastate.edu/Publications/PM683.pdf

For more information about creating the right mix of materials in compost piles, go to www.compost.css.cornell.edu/calc/rightmix.html