NC STATE UNIVERSITY

COLLEGE OF AGRICULTURE & LIFE SCIENCES

Community Backyard Composting Programs

Can Reduce Waste & Save Money

Many local governments encourage backyard composting–an array of activities that allow people to recycle organic materials at home–to reduce trash disposal, save money, and conserve natural resources. More than 25 percent of the typical household's waste is yard trimmings and food scraps that can be composted. Community public works managers across the nation have learned that the relatively small investment needed to help citizens begin composting at home is repaid many times over as local governments no longer have to collect, transport, compost, or dispose of tons of organic material.

Composting is the controlled decomposition of organic materials into a soil-like substance called compost. Organic materials, such as grass clippings, leaves, yard trimmings, food scraps, and non-recyclable paper products, can be composted at home in compost bins or piles. Backyard composting is an easy and economical way for individuals to convert their organic waste into a soil amendment that they can use to mulch landscaping, enhance plant growth, enrich topsoil, and provide other benefits to plants and soil.

Backyard Composting Benefits Communities

In 1996, The Composting Council analyzed backyard composting programs and concluded that such programs are successful and cost-effective throughout the United States, regardless of community size or socioeconomic status. When setting up a backyard composting program, governments spent an average of $12 per ton of organic materials composted at home to educate the public and promote the program. They also received an average of $1 per ton of solid waste in volunteer labor. Savings averaged $23 per ton in reduced collection costs and $32 per ton in reduced disposal costs. Total net benefit was $43 to $44 per ton of solid waste. The backyard composting programs diverted approximately 14 percent of yard trimmings generated, an average of more than 1,145 tons per year. Each household composted an average of 646 pounds per year, which amounted to more than 12 pounds every week.

Communities saved money because they didn't have to collect or process the yard waste. Residents were also able to save garbage or yard waste collection fees in areas where local governments based collection fees on volume or weight of materials disposed. Backyard composting also reduces the need for municipal composting sites and delays the need for more landfill space or incinerator capacity.

Summary of Cost-Benefit Analysis of Home Composting Programs,1995 Municipal Costs Per Ton Composted at Home

	Dollars Per Ton
Government expenditures on home composting (average)	**12**
Avoided collection costs (average)	**23**
Avoided disposal costs (average)	**32**
Value of volunteer labor	**less than 1**
Total municipal benefits (measured benefits only)	**55–56**
Total net benefit (benefits minus costs)	**43–44**

Source: The Composting Council. *National Backyard Composting Program Cost-Benefit Analysis of Home Composting Programs in the United States.* 1996.

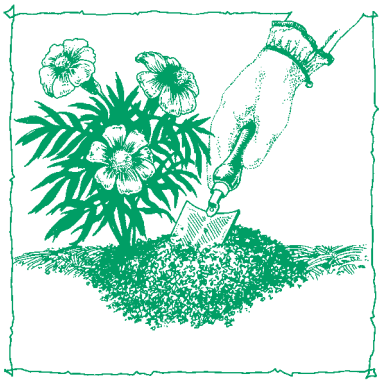
Backyard composting saves because it:

- Reduces collection, transfer, and centralized processing
- Lowers residential trash bills (where unit costing exists)
- Creates jobs (home composting program coordination and promotion)
- Reduces air and water pollution
- Reduces the need to purchase fertilizers and pesticides

Backyard composting has other benefits, such as improving soil health and fertility, providing a hands-on method of science education (especially worm composting), reducing traffic congestion (less hauling of materials), increasing exercise and relaxation, and increasing a sense of personal responsibility and personal and community pride.

When households use their compost to improve the soil, they do more than just add nutrients to the soil. Compost worked into the soil increases aeration, helps control soil erosion, increases the soil water-holding capacity, reduces water demands of plants and trees, neutralizes soil toxins, and reduces mineral leaching from the soil. Plants growing in soil with added compost have a sound root structure and deeper root growth, so they are better able to withstand drought and freeze.

Other Methods for Diverting Organic Materials

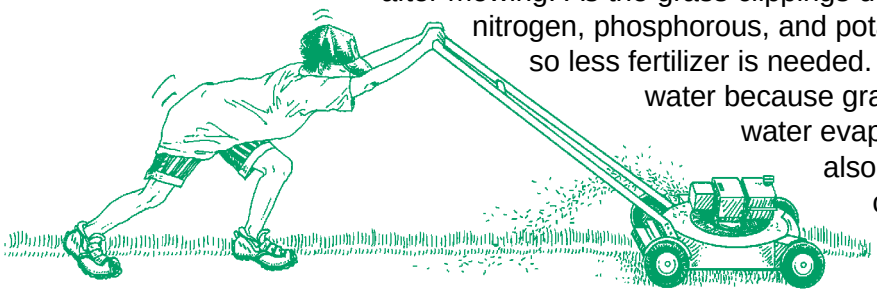


Residents can also divert organic materials from disposal through appropriate landscape design, grasscycling, mulching, direct soil incorporation, and vermicomposting.

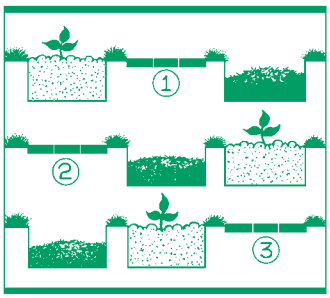
Appropriate landscape design refers to designing around naturally occurring plant habitats, resulting in a landscape that is healthier, more resilient, and easier to manage. There are three components to selecting plants with this method: 1) design

communities instead of individual plantings, 2) choose plant species native to the area, and 3) cluster plants that are adapted to similar conditions of sunlight, moisture, temperature, and soils. An effective landscape design can be less expensive and take less time to maintain than one that requires constant mowing, fertilization, and pesticide application.

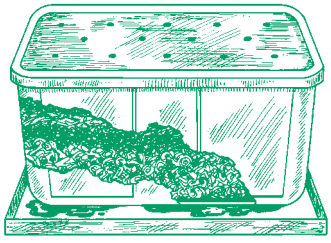
Grasscycling is simple—just leave grass clippings on the lawn after mowing. As the grass clippings decompose, they release nitrogen, phosphorous, and potassium back into the soil, so less fertilizer is needed. The lawn will also need less water because grass clippings tend to reduce water evaporation, and grass clippings also keep the soil temperature cool, which promotes better growth. Thatch buildup will not occur as a result of grasscycling because grass stems and roots cause this problem, not clippings. Each household that grasscycles typically diverts more than 1 ton of grass clippings each year from disposal. Communities with significant grasscycling programs have lower diversion costs because they don't have to collect and manage grass clippings. Grasscycling may be more cost-effective than promoting home composting, and community disposal diversion rates may be increased by emphasizing grasscycling.



Mulch is any material like grass clippings, leaves, tree and shrub prunings, compost, or wood chips that is spread over the surface of soil to improve the health of plants, eliminate weeds, and save disposal costs. Mulch conserves water by keeping soil moist and keeps soil temperatures from becoming too hot or cold. Mulch protects ground from soil erosion and stops soil compaction caused by foot traffic or driving rain. As mulch decomposes, it becomes compost, which feeds the soil and provides ideal living conditions for worms and other soil organisms that healthy soil and plants need.



The easiest way to compost food scraps is direct soil incorporation. Place chopped food scraps in a hole or trench, and cover them with at least 8 inches of soil. Many people dig a trench in the garden in the fall, gradually fill it in over the winter, and have a planting bed prepared by spring. Food scraps improve soil fertility like finished compost.



Vermicomposting composts food scraps by feeding them to worms. Redworms in bins convert food scraps to castings, which are a valuable soil conditioner. People may choose vermicomposting because they live in an apartment, they are concerned about attracting pests to outdoor compost piles, or they consider it an easy way to recycle food wastes in the winter.

Planning a Backyard Composting Program

The Cooperative Extension Center in your county brings research-based information from North Carolina State University in Raleigh. Its people can provide you with information and help you start a backyard composting program in your community.

Regardless of the size of the community, backyard composting programs tend to have at least one paid staff person who is responsible for the program, brochures on composting, workshops, a subsidized home composting bin distribution program, and an outreach program that educates school children or teachers about home or in-school composting. Some programs also have an Extension-run volunteer training program, a compost demonstration site, other written materials, advertising, and a telephone hotline.

In 1994, the University of Wisconsin conducted a survey of 249 backyard composting programs in 40 states and two Canadian provinces. The responding municipalities and counties were almost evenly divided between the following population ranges: greater than 100,000; between 25,000 and 99,999; and below 25,000. Based on an averaging of program rankings, the most effective backyard composting program components were:

1. Subsidized bin distribution
2. Variable collection fees for refuse
3. Volunteer training and outreach programs
4. School programs
5. Workshops
6. Books or booklets distribution
7. Utility bill inserts
8. Demonstration sites and displays
9. Bin distribution at cost
10. Newspaper ads

The most commonly recommended approaches for starting backyard composting programs were to: 1) recruit a volunteer community group (such as Extension's Master Gardeners or Composters) to help with education, and 2) provide free or low-cost compost bins to increase residents' interest in composting. The survey respondents made other recommendations for developing programs:

- Focus efforts on single-family households, targeting home gardeners first.
- Develop a home composting brochure (possibly adapted from existing ones).

- Harness volunteers and community support and offer workshops.
- Distribute information through the media and local groups.
- Include grasscycling tips in any promotional and educational information.
- Consider a mobile or neighborhood chipping program for brush and branches.
- Structure economic incentives for home composting by adopting refuse collection rates that reward waste reduction.
- Consider having a subsidized compost bin purchase program and one-day sales.
- Evaluate cost-sharing opportunities between jurisdictions, especially for educational efforts and bin distribution programs.
- Provide a home composting hotline number.
- Remember that success is measured over the course of at least a few years.
- Monitor results, participation and diversion rates, and cost per ton diverted.

Survey respondents identified several barriers to home composting, including apathy and resistance to change; the desire to have a "perfect, manicured yard;" concerns about odors, flies, and rodents; and the time and labor needed for composting.

Program Components

Printed Information

One of the easiest and least expensive ways to start a backyard composting program is to use printed information. Printed materials can be displayed in racks at Cooperative Extension Centers, nurseries and home centers, libraries, grocery stores, businesses, composting demonstration sites, and disposal facilities. They can also be distributed at community fairs and other activities, such as compost bin distribution events. In addition, printed materials can be mailed to residents; ask utility companies to include the information with their billings. If there are non-English speaking audiences, make sure printed materials are available for them. Printed information may include the following:

- Brochures describing why and how to compost.
- Books or booklets providing in-depth information on composting techniques and compost uses.
- Promotional flyers describing programs and opportunities for participation.
- Resource guides listing sources for bins, tools, and information, describing demonstration site locations, and giving other program information.

- Newsletters providing tips about composting, program updates, and suggestions for getting involved.

Workshops

Workshops can teach residents about methods and benefits of backyard composting, educate business personnel and public works staff about on-site composting, train volunteers, teach people how to use the composting bins, or train teachers how to teach students about composting. A workshop can be a stand-alone event or part of a group meeting or community festival. Group meetings may include Cooperative Extension 4-H or Master Gardener groups, service organizations like Kiwanis and Rotarians, church groups, neighborhood associations, employee groups, and gardening clubs. Design presentations to satisfy audience interests; for example, recyclers like to compost to reduce materials for disposal and gardeners compost so they can use the finished product as a soil amendment. Avoid using technical language for non-technical audiences; for example, use terms like “greens and browns” instead of “carbon-to-nitrogen ratio.” It’s best to involve the audience by letting them handle compost, set up a worm bin, or turn compost piles.

Compost Bin and Tool Distribution

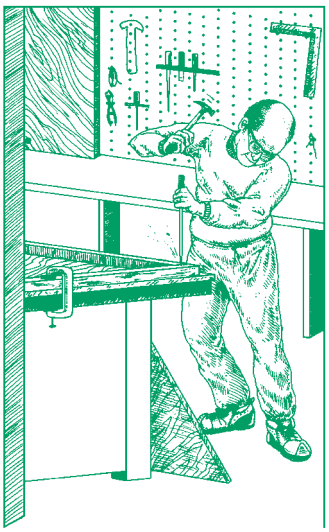
A proven method of getting residents started in home composting is to provide the equipment they need. Equipment may include compost bins, kits for converting mowers for grasscycling, compost aeration tools, and other composting tools. They may be given away, sold at workshops or other events, delivered directly to residents, or distributed through retailers. Local government agencies can save money by staging co-promotions with bin manufacturers or retailers. Manufacturers can coordinate bin ordering, delivery, or sales at special events. Retailers can help with advertising and provide discount vouchers or rebates on bins and tools. Communities can recoup bin distribution expenses through avoided yard waste collection and disposal or processing costs. Compost bins distributed by communities do not have to be commercially-made; instead, they can be made locally or converted from used materials like wooden pallets, trash cans, or industrial drums. According to the University of Wisconsin survey results of 25 communities that subsidized the cost of bin distribution programs, the average subsidy was $18.50 per bin.

Youth Programs

Youth involvement is essential in community education. Involving children in composting activities gets them started on lifelong composting habits, and kids often involve their parents and help

spread the word. A program can start with a single classroom or youth group like 4-H or Scouts and then expand throughout a community.

Resources to teach children about composting include videos, curricula, songs, resource guides, comic books, and activities. Teachers and youth group leaders can be trained to use curricula and worm bins. Youth can be reached through fun activities at community festivals and science fairs and through community service projects for students or youth groups. Children also enjoy field trips to compost demonstration sites.

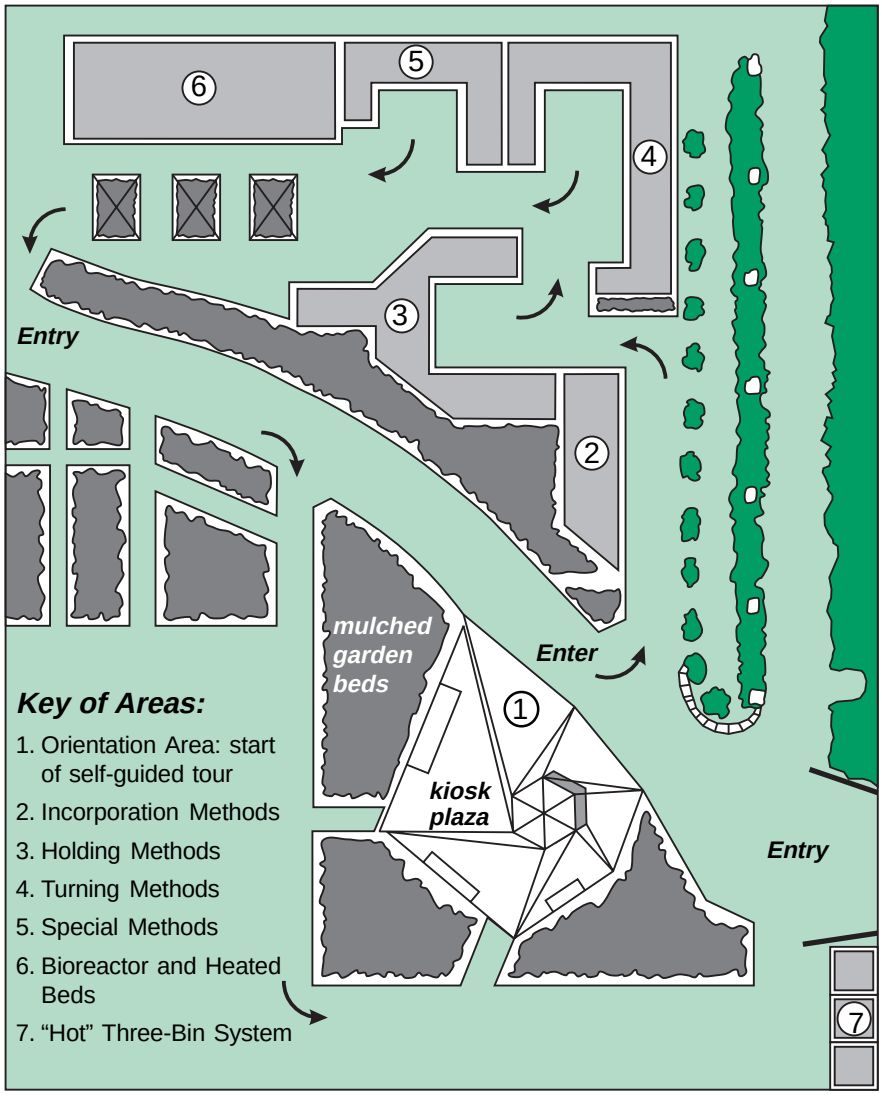


Volunteer Training Programs

Training volunteers to teach others is an economical and effective way to promote backyard composting. Volunteers make presentations to community groups and serve as role models for neighbors, friends, co-workers, and club members. Audiences that are difficult to access through promotions or professional outreach can be reached by volunteers at a fraction of the cost.

Master Composter or Community Composter programs are effective for recruiting and using volunteers. These programs are offered either by a county Cooperative Extension Center or a community solid waste management office. Master Composters are volunteers who receive free training in exchange for donating time to educate the community. The Master Composter title rewards volunteers for their efforts and establishes them as a credible information source in the community. Master Composter programs generally provide 30 to 40 hours of training in composting and outreach techniques, in exchange for a commitment to volunteer an equal number of hours for the next year. Master Composters can participate in a variety of outreach projects, either individually or in groups, according to their interests or through your direction. Allowing volunteers to choose outreach activities that they find convenient and rewarding makes it more likely that they will be effective and complete their outreach commitment. Potential projects include staffing hotlines, giving presentations, helping to distribute bins, maintaining demonstration sites, building compost bins, distributing brochures in neighborhoods, staffing display booths at community fairs, writing articles for local newspapers or newsletters, and creating new outreach tools.

It's important to keep volunteers motivated. Link volunteers who are involved in similar projects or who live in the same neighborhood, or hold potlucks or other opportunities for volunteers to share outreach experiences and ideas. Most importantly, demonstrate that volunteers' efforts are valued. Recognize volunteers at award ceremonies, in newsletters, or by providing certificates or gifts like t-shirts with a composting message.



Backyard Composting Demonstration Site

sponsored by: Seattle Engineering Department, Seattle Tilth Association

Demonstration Sites

Composting demonstration sites allow people to see and feel the composting process and work with a variety of composting systems and uses. Sites usually include composting systems, displays, interpretive signs, and plants growing in varying amounts of compost. While planning the site, consider site development (grading, water lines, seating, fences, paths, etc.), compost bins, information kiosks, self-guided tour brochures, and maintenance tools and storage. Construction costs can range from several hundred to several thousand dollars, depending on landscape improvements, the need for contracted labor, and the type of signs used. When choosing the location, consider accessibility and compatible activities that will attract visitors, such as parks, Cooperative Extension Centers,

arboretums, community centers, city halls, and schools. The site should have at least 1,500 square feet to provide enough room for bins, planting areas to demonstrate compost uses, a secure place to store tools and educational materials, and space for conducting workshops.

A sample demonstration site map on page 9 can provide ideas, but develop a plan with the assistance of a local landscape architect who can determine if the site requires grading, drainage, or other modifications. Place bins 3 to 4 feet apart to provide access for maintenance and group instruction. Make paths at least 6 feet wide to allow enough room to move materials and hold group activities.

Display a variety of home-built and commercial organic materials management systems to appeal to people with different physical abilities, aesthetics, and economic resources. These include appropriate landscape design, grasscycling, mulching, rodent-resistant food scrap composting systems, and worm bins. Hands-on, dynamic demonstrations draw visitors' interest, such as experiments, signs with moving parts, and different ways of demonstrating heat in compost piles. Signs should be simple and few.

Hotlines

Many communities use hotlines to provide information about composting and program activities. Hotlines can also be used to register people for workshops, schedule bin deliveries, and arrange other program tasks. Hotlines may be staffed or use a message and call-back system. According to 16 communities surveyed, hotlines answer an average of 900 calls per year. The cost of a hotline is usually no more than that of a standard local business telephone line and an answering machine or voicemail system.

Related Publications and Audiovisuals Available From Your Cooperative Extension Service Center

Your Extension Center can provide publications and lend the following videotapes and slide sets prepared at NC State University for use in the community:

- *Backyard Composting* (1992) 25-minute videotape. Extension Horticultural Specialist Larry Bass and Extension Landscape Specialist Kim Powell discuss backyard composting and show how the Extension is involved. Sections include introduction to backyard composting,composting structures, building a compost pile, and using compost in the landscape.
- *Backyard Composting* (1992) 45 slides with script. This program introduces five basic aspects of home composting: organisms involved in the composting process; components of the composting process; materials that can be composted; home composting systems; and uses of compost.

- *Composting: A Guide To Managing Organic Yard Wastes* (1995) AG-467. Publication.
- *Composting with Larry Bass* (1993) 9-minute videotape covers composting, organic fertilizers and insecticides, fall gardening, and fall garden cleanup.
- *Grasscycling* brochure by Art Bruneau (1992).
- *Home Composting: Master Composter Training Manual* (1992). Teaching module for agents and volunteers which details how to develop and implement a Master Volunteer Program for composting.
- *Municipal Solid Waste Composting: Is It Right for Your Community?* (1993) 22-minute videotape. Community decision-making regarding composting.
- *National Backyard Composting Program Training Manual* (1996). The Composting Council's 225-page manual covers all aspects of developing and implementing a home composting program.
- *Recycle Your Garbage With Worms!* (1995) 16-slides with script. How to set up and maintain a worm bin for the home, office or classroom.
- *Using Compost for Landscaping and Nursery Production* (1996) 20-minute videotape. Two of America's leading compost marketers and users lead you through a number of applications for quality compost.
- *Worms Can Recycle Your Garbage* (1996 rev.) AG-473-18. How to set up and maintain a worm bin in your home or office to compost food scraps. This publication is also available on the Web at http://www.bae.ncsu.edu/people/faculty/sherman/
- *Worm Away Your Cafeteria Food Scraps* (1997) AG-551. Publication.

Your Extension Center can also help you get copies of the following or help you access them on the Web:

- *Composting for Home Gardens* (1990) HIL-8100. Larry Bass, Horticulture Department or http://www/depts/hort/hil/hil-8100.html
- "North Carolina Worm Resources" (1996, rev. 1999). *Vermicomposting News* - No. 2. Lists vendors of worms and supplies. Rhonda Sherman or http://www.bae.ncsu.edu/people/faculty/sherman

Resources

Contact your local Cooperative Extension Service Center or:

- Biological and Agricultural Engineering Department, NC State University, Box 7625, Raleigh, NC 27695-7625. Rhonda Sherman, phone: (919) 515-6770; fax: (919) 515-6772; e-mail: sherman@unity.ncsu.edu; URL: http://www.bae.ncsu.edu/people/faculty/sherman
- Horticultural Science Department, NC State University, Box 7609, Raleigh, NC 27695-7609. Larry Bass, phone: (919) 515-1200; fax: (919) 515-7747; e-mail: larry_bass@ncsu.edu.
- Division of Pollution Prevention and Environmental Assistance, Department of Environment and Natural Resources, P.O. Box 29569, Raleigh, NC 27626-9569. Craig Coker, phone: (919) 715-6524 or (800) 763-0136; fax: (919) 715-6794; e-mail: craig_coker@p2pays.org; URL: http://www.p2pays.org
- The U.S. Composting Council, P.O. Box 407, Amherst, OH 44001. Phone: (440) 989-2748; fax: (440) 989-1553; e-mail: easimbrogno@centuryinter.net.; URL: http://www.compostingcouncil.org

The National Backyard Composting Program provides a manual for implementing home composting programs; computer files including text and graphics for brochures on backyard composting, grasscycling, mulching with yard trimmings, and worm bin composting; text and graphics for design sheets for building a wooden pallet bin, snow fence unit, wire mesh bin, movable compost bin, recycled barrel compost tumbler, concrete block and wooden three-bin turning bins, worm bin, and garbage can composter; clipart on floppy disks or CDs; vendor lists for bins and tools; lists of books and publications; sources for videos and slide presentations; and contact information for organizations and programs.

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