How to Recycle Shade Tree Materials

TREE CITY USA® BULLETIN

No. 16 Editor: Dr. James R. Fazio • $3.00

"Sustainability" has almost become a household word in recent years. As a society, we seem to be realizing that land and resources are limited and that stewardship is an increasingly important responsibility. Recycling is one of the keys to sustainability. In this issue, you are invited to explore some of the ways that leaves, pruned limbs, and removed trees can keep contributing to the livability of our communities instead of being a wasteful burden.

In the early 90s, the Arbor Day Foundation was among the first major organizations to adopt the practice of using recycled and recyclable paper. This included office stationery, envelopes, and our many publications, such as Tree City USA Bulletins. From its beginning, we have also featured an aggressive recycling program for all wastes at the Lied Lodge & Conference Center at Arbor Day Farm. We continue these practices today and regularly encourage members to be conscious of conserving our nation's resources.

There has been significant progress in the past couple decades toward making recycling a part of corporate and individual lifestyles. Part of the good news is that according to the Environmental Protection Agency, recycling and composting prevents more than 87 million tons of material from being disposed, up from only 15 million tons in 1980. This prevents the release of approximately 168 million metric tons of CO_2 into the air — the equivalent of taking more than 33 million cars off the road for a year. Solid waste generated in the U.S. has stopped its steep climb and, in 2005, began to level off. The bad news is that we still produce more waste than we should. On average, each of us generates from 2.7 to 4.6 pounds of waste per day, adding up to a staggering 258 million tons of trash per year.

Along with the need to wisely use natural resources is the need to conserve land and water by minimizing the growth of landfills. Today, the EPA reports that more than 13 percent of the nation's waste materials are from trees, bushes, grass clippings, and other discarded vegetation. This equates to 34 million tons of material added to the landfills — and often at a cost to homeowners and taxpayers. But again, there is also some good news to report. Currently about 61 percent of what EPA labels "yard trimmings" is being recovered.

While the percentage of trees' waste being recycled is encouraging, there is still much room for improvement. As cities and towns face the problem of solid waste disposal, street and park trees may come under greater scrutiny as ways to save money and reduce wastes. Rather than reducing the number of trees, we suggest turning the problem into an opportunity. This issue presents many examples of how recycling of tree material can be used to reduce the burden on landfills and contribute to making our homes and communities better places in which to live.

Many symbols are used to identify recycled or recyclable materials. In some ways they are to recycling what Smokey Bear is to wildfire prevention. These are visual ways to keep recycling on the conscience of the public while at the same time helping people make decisions and act responsibly.

This is called a "mobius loop" and comes in many designs and colors. Usually it indicates that the object can be recycled. Sometimes, however, it is used to indicate that the material contains recycled content. If so, a percentage figure appears in the middle to show the amount of recycled content.

This symbol denotes products certified as compostable by the Biodegradable Products Institute. But even if a product has no symbol, it might still be compostable.

Links to more information about about these and other recycling symbols can be found at the website noted on page 8.

Problem or Opportunity?

In the 1970s, Northwest Missouri State University faced the rising costs of natural gas and heating oil. The university administration wisely turned to wood chips, the byproduct of the state's active wood industry. This move, eventually supplemented with recycled paper products and other alternative fuels, has resulted in more than $12 million in savings through the years and many awards for protecting the environment.

In Paramus, New Jersey, autumn leaves are as much work to clean up as anywhere with deciduous trees, but after looking into composting instead of dumping, the community now provides free compost to residents and earns money selling it to landscaping companies — all while saving a bundle in landfill costs.

Throughout America, progressive individuals, companies, and communities are searching for ways to turn what scientists call "negative value biomass" into something positive, useful, and sometimes even profitable. But it all begins with attitude.

Burning leaves in the fall is an annual tradition in some communities. In others, the custom is to rake the leaves into huge curbside piles to be picked up and hauled to the dump. Both traditions are destined to become only memories as air pollution laws and closed landfills force citizens to find a better way.

Recycling Leaves

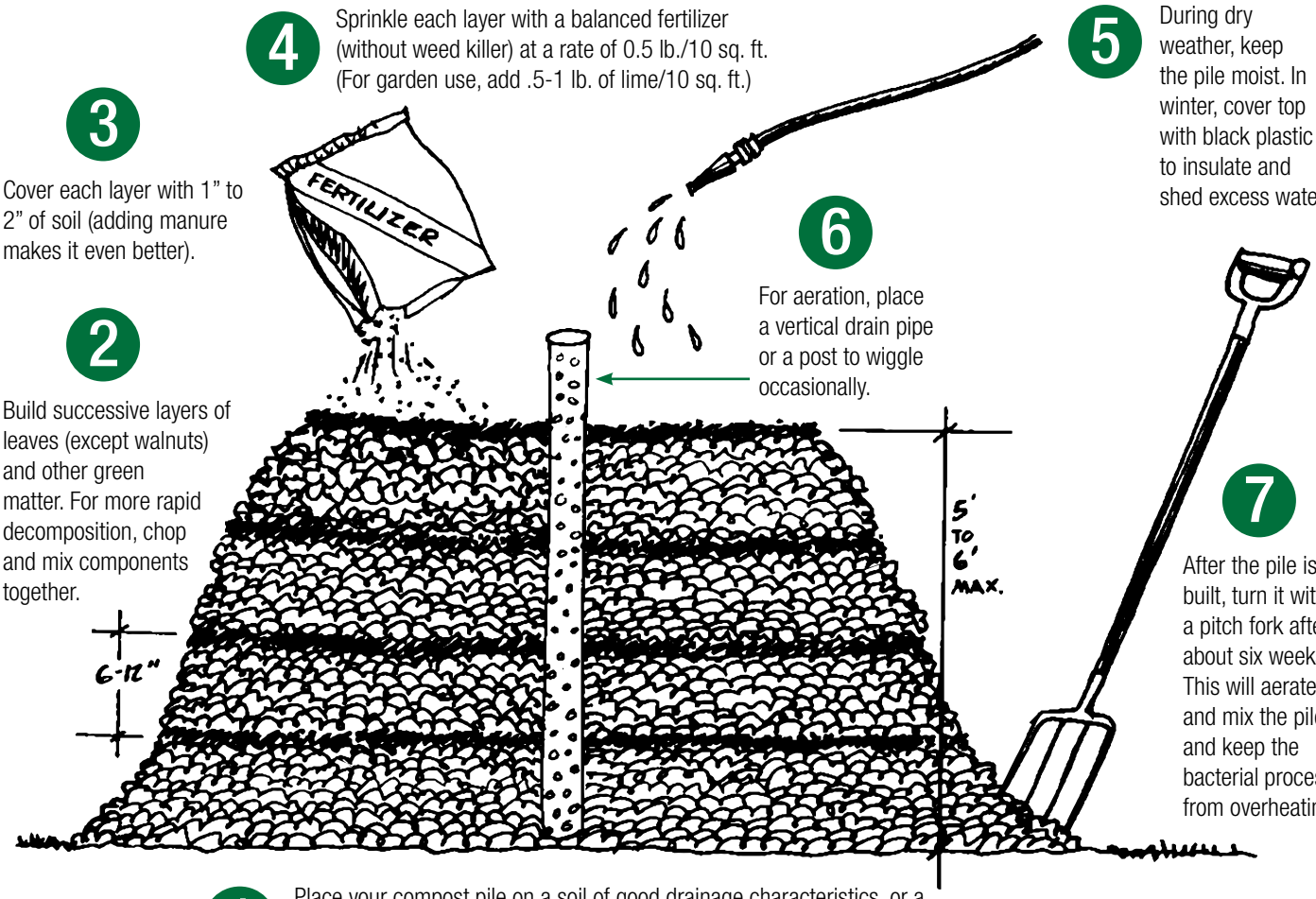
In a forest, nature's way of leaf disposal is to leave them there on the forest floor to recycle through a slow but essential decomposition process. The result is a rich, spongy topsoil. It is home for worms and other organisms that help in the process, and it serves the future forest by soaking up water and providing nutrients and a good growing medium for new seedlings.

Composting is the same process sped up. It is simply the biological decomposition of organic wastes under controlled conditions. With a little work and in any space that your yard allows, large quantities of leaves, garden refuse, twigs, and grass can be reduced to compost in as short a time as one to three months. You know the compost is ready when your pile becomes a dark, granular mass that resembles peat moss and the individual ingredients are no longer recognizable.

Although the end product is not a fertilizer, compost does offer these benefits:

- An inexpensive way to dispose of leaves without using landfills or polluting the air.
- When added to the garden or tree planting site, compost improves the physical properties of the soil for better root growth by:
  - Lightening up clays or enhancing soil aggregation in sands.
  - Decreasing soil crusting and cracking.
  - Improving water infiltration and retention.
  - Improving aeration.

HOW TO MAKE A COMPOST PILE



1 Place your compost pile on a soil of good drainage characteristics, or a layer of limbs. Boards, chicken wire, or other side frames can help hold the pile together if space is limited.

2 Build successive layers of leaves (except walnuts) and other green matter. For more rapid decomposition, chop and mix components together.

3 Cover each layer with 1" to 2" of soil (adding manure makes it even better).

4 Sprinkle each layer with a balanced fertilizer (without weed killer) at a rate of 0.5 lb./10 sq. ft. (For garden use, add .5-1 lb. of lime/10 sq. ft.)

5 During dry weather, keep the pile moist. In winter, cover top with black plastic to insulate and shed excess water.

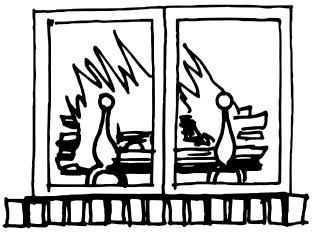
6 For aeration, place a vertical drain pipe or a post to wiggle occasionally.

7 After the pile is built, turn it with a pitch fork after about six weeks. This will aerate and mix the pile and keep the bacterial processes from overheating.

Recycling Tree Branches

Recycling branches from pruned or removed trees presents more of a challenge than recycling leaves. However, there are at least three options.

FUELWOOD

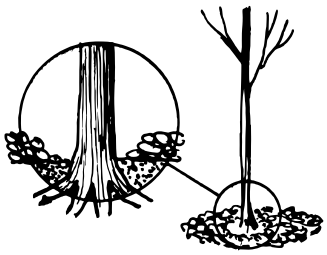


Cut limbs in appropriate lengths, dry, and burn as heating fuel in the fireplace, wood stove, or furnace. Be sure that your equipment uses current technology that provides maximum heat while at the same time cutting down on air pollution. Using thoroughly dried wood also helps keep air clean and reduces the buildup of dangerous creosote in the chimney. Also read the tips on page 5, with particular attention to disease and insects.

COMPOST

Chipped limbs can be added to a compost pile, but this option presents a technical problem. In short, for optimum decomposition to take place in a compost pile, a chemical balance of 25 parts carbon to 1 part nitrogen must be present. This is because microorganisms –– the key to decomposition — use 20 to 30 times more carbon than nitrogen (thus the ratio, 25:1). Any deviation from this ratio in the pile slows the rate of composting. Wood chips overload the pile with carbon and can raise the C/N ratio to 150:1 or as much as 750:1 in the case of pine. When this happens, it is necessary to add nitrogen (fertilizer or manure) to bring the ratio down closer to 25:1 to ensure composting in a reasonable amount of time.

MULCH



Mulch is a tree's best friend, and chipped wood is an excellent mulch. It insulates the soil, retains moisture, helps keep out weeds, prevents compaction, protects bark from lawnmowers, and even adds an aesthetic touch to the yard or street.

Note: To prevent disease and reduce rodent damage, chip mulch should not touch the tree and should not exceed 2"-4" in depth.

TIPS ABOUT WOOD CHIP MULCH

The word "mulch" refers to any soil covering used for weed control, moisture retention, and similar purposes. Wood chip mulch offers most of the benefits of a good mulch, and it is an excellent way to recycle tree wastes.

1. CHIPPING

Mechanical shredders, grinders, and chippers are available to rent or purchase for home use. If renting, store woody material until you have a sufficient quantity to justify the rental. Consider going together with neighbors to share the cost. Whether renting or buying, make sure the unit can handle the size of branches you have on hand. And work carefully!

2. NITROGEN DRAFT

If wood chips are mixed into the soil, their decomposition causes nitrogen draft, a temporary deficiency of available nitrogen needed by roots. Avoid this by not digging uncomposted chips into the ground. Mulch is meant as a surface treatment. As such, the slow, natural decomposition where chips interface with the soil has a negligible short-term effect on nitrogen availability and in the long term will actually add nutrients. The use of sawdust, however, may require the addition of nitrogen fertilizer.

3. TOXICITY

Chip mulch can be toxic to young trees and other plants if stored in large piles with inadequate aeration. This is prevented by keeping chip piles under 8' and by properly turning chips that are being composted. Some species may also cause problems. In *Arboriculture*, it is noted that problems have been reported about eucalyptus sawdust and leaves, redwood and cedar sawdust, and the bark of Douglasfir and spruce. Proper composting removes or inactivates the toxic substances. Avoid chipping poison ivy vines if the chips will come into contact with people.

Trunks and Limbs

The trunks and large limbs of downed trees can continue the life of your tree by being converted into posts, garden edges, benches, rustic steps, or other useful lawn items. Large walnuts, black cherries, and many other hardwood species may have value to a local sawmill or woodcrafter. Most commonly, however, firewood is the best alternative to wasteful dumping. If you have no fireplace, consider giving the wood to a friend or needy family or selling it and using the money to buy a new tree to plant.

FIREWOOD TIPS

❶ DRYING

Green wood may be up to 95 percent moisture by weight. It needs to be about 20-35 percent for efficient burning. If kept outdoors and under cover, three to nine months are needed for most species to be dry enough for optimum burning. To know when wood is well-seasoned, periodically weigh a sample piece. When weight loss is negligible, the wood is seasoned.

❷ DISEASE

Storage of elm wood is illegal in Minneapolis and some other cities. Where storage is allowed, help prevent the spread of Dutch elm disease by stripping the bark off green or dying elm wood and burning it immediately or taking it to a sanitary landfill in bound, plastic bags.

❸ INSECTS

Prevent termite and other pest problems by keeping your woodpile area clean, tidy, and away from house walls. Use your entire supply annually. When you go camping or move from one residence to another, do not take your firewood with you. There is too much risk of spreading insect pests such as gypsy moths, Asian longhorned beetles, emerald ash borers, and other invasives that are often dispersed in this way.

❹ BUYING OR SELLING CORDWOOD

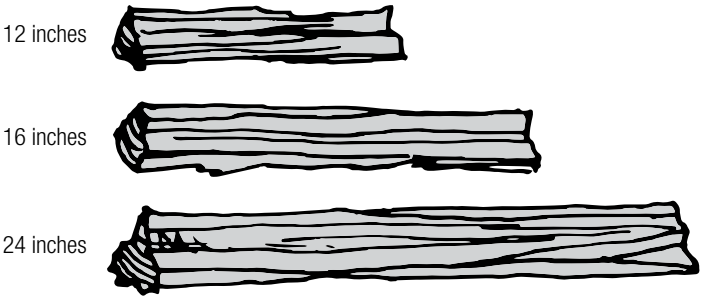
Firewood is often bought and sold on the basis of a "cord" of wood. Unfortunately, this term is used differently by different people. A standard cord is 128 cubic feet or a stack of roundwood that measures 4 feet high, 4 feet deep, and 8 feet long. A "face" cord can mean almost anything. This is because it is 4 feet high and 8 feet long, but the depth, or length of each piece of firewood, will vary. When comparing prices, be sure to know what dimensions are being used.

DON'T MOVE FIREWOOD

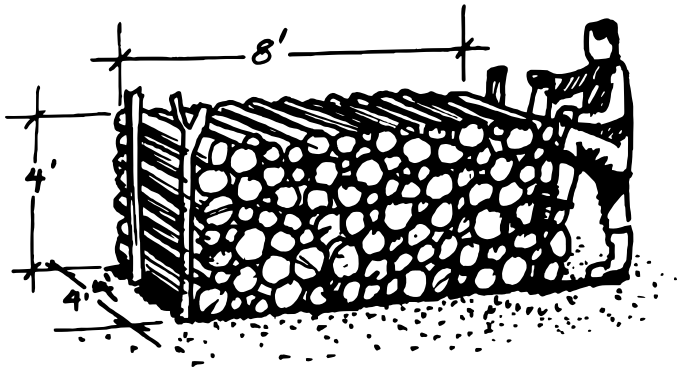
In some places it is the law, but everywhere it makes good sense. When moving or going camping, leave your firewood behind and buy it locally. This is one way to help stop the spread of harmful insects and tree diseases.

Chipping equipment of any size is extremely dangerous. Keep children and bystanders away from the chipper at all times and be sure the operator wears face and eye protection, ear plugs, gloves, and a hard hat.

COMMON FIREWOOD LENGTHS



The ideal length is 4 inches shorter than the firebox to be used.



One standard cord

Recycling and the Community Forestry Program

Recycling is capturing the imagination of progressive organizations and communities throughout North America. Here are examples that are worth considering.

CASH TO TREES

In some areas, money from recycling campaigns is used to purchase trees. Old newspapers, aluminum, glass, and can drives have produced extra cash for trees. The concept is that people will volunteer to recycle if they know the money from the project goes to a good cause, such as tree planting.

SAVE A TREE

In the usual sense of the meaning, saving otherwise doomed trees is not recycling. It is, however, a way to prevent the waste of a valuable community resource. Trees for Houston is an example. One of the organization's services is to work with developers to find ways of preserving and using existing trees. Another idea is championed by Seattle's PlantAmnesty. In each of PlantAmnesty's newsletters, readers have the opportunity to describe shrubs and young trees they need to have removed. A phone number is given and interested individuals can make arrangements to do the transplanting.

LARGE-SCALE LEAF RECYCLING

What does a community do with 60,000 cubic yards of leaves each year? In Paramus, New Jersey, the city purchased a $52,000 leaf-shredding machine in the late 1980s and went into composting in a big way. Almost immediately, $37,000 in dumping fees was saved and $4,000 worth of compost was sold to landowners. Since then, sales have averaged nearly $12,000 per year, and that is after first using much of the compost for the city's landscaping needs and the development of new ballfields.

CHRISTMAS TREES

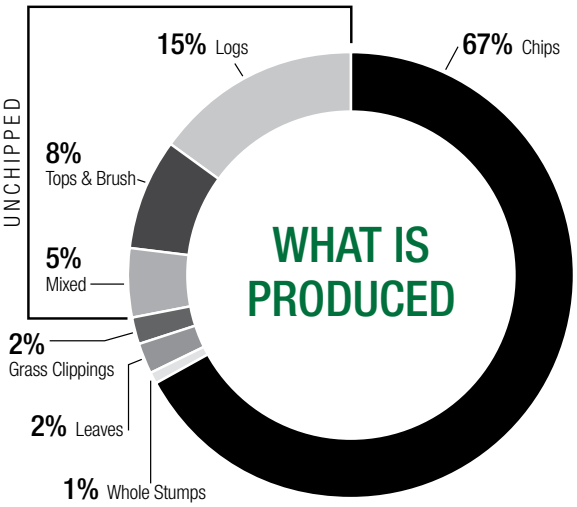
Cities from Austin, Texas, to Regina, Saskatchewan, have various versions of a program to keep Christmas green and natural while at the same time not overloading landfills. Some communities pick up trees, some require delivery to a specific site. Some chip their trees, others put them to use stabilizing sand dunes, controlling erosion, or creating fish habitat at the bottom of reservoirs (by binding trees together and weighting with building blocks).

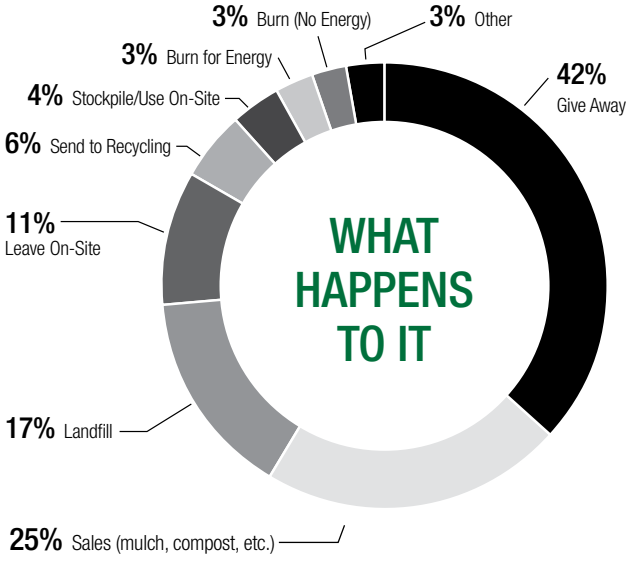
Whatever the system, communication with every family in the community is essential for a successful program. This is being done with announcements on radio, TV, and in local media; by explanatory tags placed on Christmas trees in sale lots; or through literature distributed at schools and stores.

Incentives are important, too. Some people will be satisfied just knowing that their Christmas trees will be put to good use. Others may be more motivated if given a free seed packet discount coupon from a local nursery, a seedling to plant (in warm regions), or other small gift when they bring in their trees.

URBAN TREE RESIDUES

The figures below are from a national survey conducted by the International Society of Arboriculture in partnership with the Allegheny Power System and the Tree Care Industry Association. Results are based on information from 1,513 organizations in urban forestry.





COMPREHENSIVE PROGRAMS

Ultimately, a community's goal should be recycling all of its tree waste materials. Cities like Urbana, Illinois; Cincinnati, Ohio; and St. Cloud, Minnesota, are already there.

In Urbana, 20 acres atop the former landfill serve as a receiving site for material from landscape contractors, forestry departments in surrounding communities, and the area's trash haulers who pick up yard refuse. At the site, material is divided into three categories and treated accordingly: (1) leaves and grass become compost, (2) brush and branches are chipped, and (3) wood more than 8 inches in diameter is cut and processed for wood mulch or seasoned for firewood. All is then sold, making the Landscape Recycling Center completely self-supporting. Together with savings on landfill costs, this is a great example of a financial as well as an environmental success.

Similarly, in Cincinnati, since 1982, none of the more than 10,000 street trees or 15,000 stumps removed or the branches from countless numbers of trees pruned by crews and contractors has ended up in a landfill. Trunks and larger limbs are cut into firewood and given away, and species like oak and ash are cut into lumber by a contractor and provided to the city's schools for shelving and other uses.

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Perhaps the grand champion is St. Cloud, Minnesota. During the 1980s, city forester Scott Zlotnik found a way to stop filling the landfill with tree refuse. Instead, the city has become very adept at using every leaf, twig, trunk, and stump. At one time, 10,000 board feet was milled from the trees to provide lumber for municipal uses such as trailer beds, skating rink boards, and traffic barriers. In the winter, firewood was used to heat the city's skating rinks and warming shelters. Chips from limbs and ground-up stumps became mulch used on nature trails and playgrounds. Leaves were composted or shredded and left in place in the parks and on public lawns. This aggressive and outstanding program not only helped solve the community's tree waste problem, it even generated some income that helped purchase replacement trees where removals were necessary.

IS YOUR CITY FLOODED WITH CHIPS?

What do you do with wood chips when all the park trails are built, tot lots are softened, the trees are mulched, and people have all the chips they can use?

An endless stream of recycled trees can flow to power plants for generating steam or even electricity. No foreign oil, no new dams, no high technology — just wood-fueled boilers.

Currently, institutions that have adopted this technology usually rely on wastes from sawmills or wood-using factories, such as pallet mills and furniture manufacturers. Some, however, have broadened their intake to include a municipality's tree refuse. To learn more about the clean, modern use of fuelwood for heating and air conditioning, you are invited to visit the facility used at the Lied Lodge & Conference Center at Arbor Day Farm. There you can observe how wood chips are used to fuel the conference center's boilers and learn more about this source of energy that comes from the productive use of wood wastes. This and other sustainable solutions and green practices are also listed at **arborday.org/green**.

Wood chips waiting to heat the halls of academe at Northwest Missouri State University.

Getting the Most from a Christmas Tree

From the object of a family outing to firewood and garden fertilizer, this Christmas tree — thinned from an overcrowded forest — is cycled through many good uses.

At the Fazio household in Moscow, Idaho, the annual Christmas tree gets more use than probably any other tree in town.

The family tree spends its first years in a nearby national forest. There it provides the usual benefits of wildlife habitat, carbon sequestration, oxygen production, and rainwater retention. However, the trees are too crowded in the forest for good growth, so the U.S. Forest Service sells permits and allows residents to locate and cut their own Christmas trees. The Fazios make a family holiday out of searching for just the right one, cutting it, and skiing back to the car with it. They insist on finding a young Douglasfir because its soft, green needles provide a nice fullness to the tree and remain on the branches indoors throughout the holidays. "It is our equivalent of a hunting trip, but we can do this together and we are always sure of bringing home our quarry," says Dawn Fazio.

Once it is home, the tree's lower limbs are trimmed off and used for a door wreath and garlands around the living room. The tree, of course, is decorated and serves as the centerpiece of holiday festivities. In January, the tree's next home is the back porch. There it is placed next to the bird feeder as an additional place for birds to rest. Sometimes bird feed is added to its limbs. It serves in this way as bird cover and porch decoration well into late spring. At that point, the trunk is cut into firewood for winter or the summer barbeque pit. Finally, the limbs are placed with last summer's garden refuse and burned during the town's open-burning period. This, too, is a family event, and the ashes are dug into the garden to enrich the soil with potash and phosphate. The last of the Christmas tree will help grow the beets and tomatoes of summer.

FOR MORE INFORMATION ...

For sources of additional information about recycling wood refuse and garden wastes, please visit **arborday.org/bulletins**.

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Arbor Day Foundation in cooperation with the U.S. Forest Service and National Association of State Foresters. To achieve the national recognition of being named as a Tree City USA, a town or city must meet four standards:

Standard 1: A tree board or department
Standard 2: A tree care ordinance
Standard 3: A community forestry program with an annual budget of at least $2 per capita
Standard 4: An Arbor Day observance and proclamation

Each recognized community receives a Tree City USA flag, plaque, and community entrance signs. Towns and cities of every size can qualify. Tree City USA application forms are available from your state forester, the Arbor Day Foundation at **arborday.org/treecity,** or your state forestry agency.

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