TREE CITY USA®
BULLETIN
No. 39
Dr. James R. Fazio, Editor • $3.00

Putting Trees to Work

As our world grows ever more competitive, shade and beauty alone are not enough to justify the planting and care of community trees. Trees must pay their way — and they can. Opportunities abound for putting trees to work and the results are cost savings and increased public safety as well as a more pleasant living environment.

James R. Fazio

Trees in this new housing development in southern Idaho provide practical benefits beyond beautification. Shielding homes and lawns from the wind, saving energy through cooling, buffering sounds, and 'calming' the flow of traffic are just some of the ways trees can be put to work in our communities.

A friend of Tree City USA in an Idaho community once had a neighbor with a totally treeless property. One day the tree lover asked the neighbor why he didn't plant some trees. The answer was, "If you can't eat it, why plant it?"

While this attitude may be extreme, it illustrates a challenge to anyone who cares about perpetuating trees in the community. Put differently, there are many people — including some municipal officials — who are motivated largely by practical matters. Their question is, "What can trees contribute to justify the expense of planting and caring for them?"

Fortunately, there are good answers to this question. Working trees extend their roots back to the beginning of civilization. Edward Hyams, author of *A History of Gardens and Gardening*, suggests that fruit trees were planted and cared for in the latter period of the Stone Age. They even predate cereal crops and the advent of agriculture. In essence, trees were already at work when humans got around to organizing themselves into communities.

When immigration to America began, working trees came along. Immigrants sometimes stuffed their pockets with English walnuts which were then planted around the new home for food, shade and memories of the country left behind. Many species went west in the holds of sailing ships and squeezed into Conestoga wagons, ready to help with the new beginning. When J. Sterling Morton proposed the first Arbor Day, he had in mind all sorts of roles for trees—not just shade and beauty, but food, lumber and shelter from the wind.

Today there is a new awareness of trees at work. This issue of the Bulletin highlights some of the ways trees provide practical service in addition to giving us beauty and joy. We need to spread the word. Like the treeless neighbor in Idaho, there are people who have not yet discovered the practical side of trees. When they do, it could mean a whole new cadre of support for community forestry.

Published by
Arbor Day Foundation®
100 Arbor Avenue • Nebraska City, NE 68410

Taking Country Concepts to Town

Working trees are planted in a specific place, in a specific design, for a specific, practical purpose. These trees have a job to do.

— Jerry Bratton, Retired National Agroforestry Center

The concept of working trees on the farm is not new. Fruit orchards were quickly planted by the first settlers and small woodlots have provided generations of farm families with firewood, lumber, posts, poles and maple syrup. Then, in the Dust Bowl era, narrow bands of trees were planted, spreading across the Great Plains like a huge army marching out to face the relentless onrush of wind. Trees were also planted on steep hillsides to shelter soil from the rain, keeping silt from muddying rivers and letting water soak into the earth where it could slowly feed springs and farm ponds.

In 1991, staff at the USDA Forest Service Rocky Mountain station's Center for Semiarid Agroforestry (now National Agroforestry Center) in Lincoln, Nebraska, came up with the idea of extending the concept of "working trees" to towns and cities. It was not that trees weren't already providing practical benefits in town, it was more an idea to identify even more uses, provide technical advice for planting and maintaining the trees, and publicize the concept of working trees and how they expand the environmental benefits of community forestry. In short, the idea was to try urbanizing some of the uses of trees that had been integrated so successfully into farm and ranch operations.

As a first step, the new Forest Service program tested several pilot sites. The projects met with enthusiasm in each community and demonstrated their potential both technically and socially. The pilot communities are shown in the box on this page. More information about the National Agroforestry Center and its work in both its urban and rural settings, visit www.unl.edu/nac.

Take a Look – Trees Working!

Here are some of the municipalities identified by the USDA Forest Service National Agroforestry Center as pioneering in the concept of Working Trees for Communities.

Conrad, Montana

A windbreak around Prairie View School — designed and planted with the help of the kids — breaks the wind, decreases fuel costs, increases observable wildlife populations, and serves as an outdoor laboratory.

Woodward, Iowa

Over a mile of existing windbreak was expanded around Woodward State Hospital and School to improve wind protection and control drifting snow, thereby reducing fuel and snow removal costs and keeping emergency entrances open.

Harrison, Nebraska

Tired of snow-blocked roads, the community planted an 11-row living snow fence to protect the main access road. The project is also a demonstration to encourage local ranchers to make similar plantings to protect livestock.

Superior, Nebraska

Trees and shrubs have been planted along Lost Creek in the city park to re-establish bird habitat, control streambank erosion, reduce silt in the park's fishing pond, and provide diversity for an interpretive trail.

Fargo, North Dakota

By surrounding the community ball fields with trees, irrigation costs related to wind-caused evaporation are reduced, wind-blown debris from a nearby waste water storage facility is prevented, soil erosion is controlled and a nearby waterway is buffered from the runoff of excess turf fertilizers and pesticides.

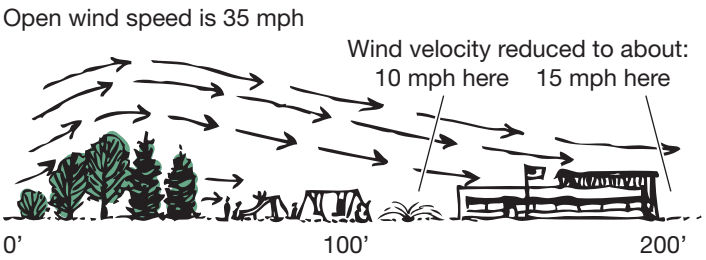
National Agroforestry Center

A North Dakota developer planned ahead to let trees help. Building lots are surrounded by windbreak trees well in advance of construction.

The Practical Role of Community Trees

Windbreaks

Windbreaks traditionally have done their work on America's Great Plains. Over 90,000 miles of trees protect more than 6 million acres of cropland. In communities, the same techniques can be used to protect homes, institutions and recreation areas. Trees add comfort by diverting the wind. They also lower fuel bills in the winter and make turf irrigation more efficient by reducing evaporation in the summer.



Windbreaks can be planned to fit the space available. While five rows of trees and shrubs are recommended, fewer can be used when necessary. Columnar cultivars can also help squeeze a windbreak into narrow urban spaces.

National Agroforestry Center

Two rows of eastern redcedar and a Norway spruce/white pine combination were planted beside two existing rows of honeysuckles to shelter the grounds of Woodward State Hospital and School in Woodward, Iowa. Breathable fabric was put in place to control weeds and then later covered by wood chip mulch.

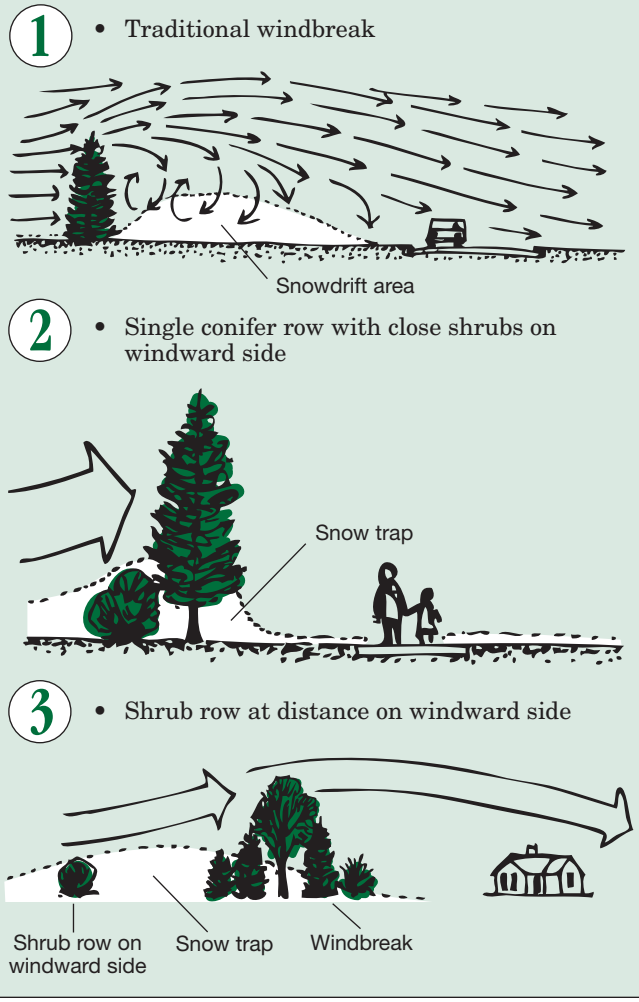
Living Snow Fences

Strategically placed rows of trees and shrubs can help control blowing snow. This not only contributes to public safety, it can reduce snow removal costs. According to the Laramie County Conservation District in Wyoming, replacing traditional slatted fences with living snow fences has saved taxpayers up to $4,933 per mile per year. In Laramie County alone, its 53 living snow fences are saving roughly $74,000 tax dollars every year!

By controlling where snow piles up, it is also possible to increase spring soil moisture on lawns, ball fields and other areas of grass. By using trees and shrubs preferred by birds or other desirable wildlife, yet another benefit can be added.

These trees were strategically planted to keep snowdrifts off this street.

Three Ways to Control Snow



The Practical Role of Community Trees Continued

Streambank Stabilization

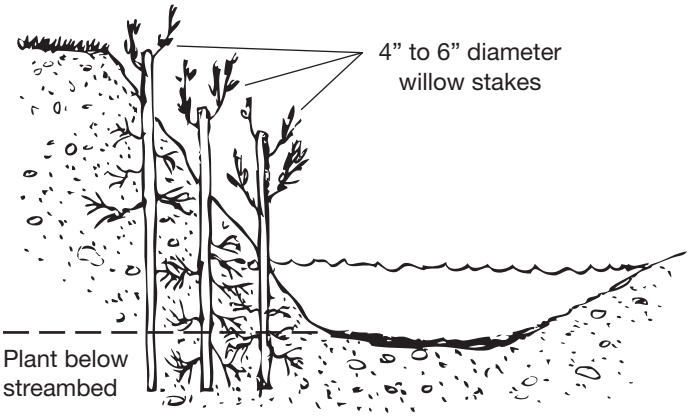
Trees and ground covers can be planted to prevent creeks from eroding their banks. Willow cuttings are perhaps the fastest way to establish tree cover. In severe cases, willow posts up to six inches in diameter are used. These are cut from willow thickets elsewhere and are placed in holes created by steel rams or hydraulic augers. By planting the posts deep, the soil-holding ability of the roots they grow is increased. If the trees are planted closely in offset rows (staggered), their branches will interlock and provide a high degree of protection from heavy rains. This kind of growth will also slow flood waters, reducing their power to erode.

Gary Wells

Waterways of any size can add enjoyment to life and value to property. Eroding banks, however, can turn a dream into a nightmare by creating boundary disputes, threatening yards and farmland, and even buildings, and reducing downstream water quality. Trees, shrubs and sod can be put to work keeping water where it belongs.

Controlling Hillside Erosion

The contours of growing communities are constantly changing. On slopes and steep banks, either natural or created by development, trees have a job to do. While sod and ground covers hold topsoil in place, tree roots can penetrate deeper and anchor large blocks of soil. Just as importantly, leaves and branches break the force of falling rain, providing a first line of defense against soil erosion. Densely-planted conifers or trees with thorns (such as hawthorns) can do additional duty by keeping mountain bikes, foot traffic and motorcycles off slopes that are prone to erosion.



Sticks, or stakes, cut from willows elsewhere will sprout roots and branches that hold soil in place and break the force of falling rain.

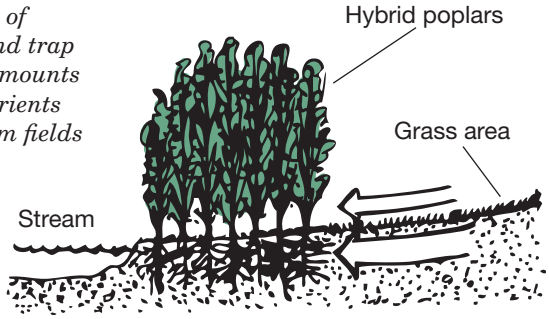
Landfill Cover

Dense plantings of hybrid poplars have been used by the University of Iowa to cover an old landfill. The purpose was to reduce leaching by having the tree roots capture rain water before it could reach the covered dump. In testing the results, it was found that despite 38 inches of annual rainfall, the densely-planted trees (one per 3.4 square feet) prevented all water from passing through the root zone during the growing season and for a long time into the fall and winter.

Buffer Strips

Trees adjoining farm fields have been shown to form powerful buffer strips that absorb excess agrochemicals before they can contaminate nearby waterways. This same method can be applied in urban conditions to control lawn, ball field and golf course turf chemicals.

Buffer strips of trees filter and trap significant amounts of excess nutrients in runoff from fields and lawns.



Visual Screening

Trees can earn many times their cost by changing the visual qualities of a property. Whether it is improving the appearance of commercial property or screening out an undesirable view from a residence, even a single row of conifers can make a big difference. With a little more landscaping, the ugly can actually be made beautiful.

iStockphoto.com / Cathleen Abers-Kimball

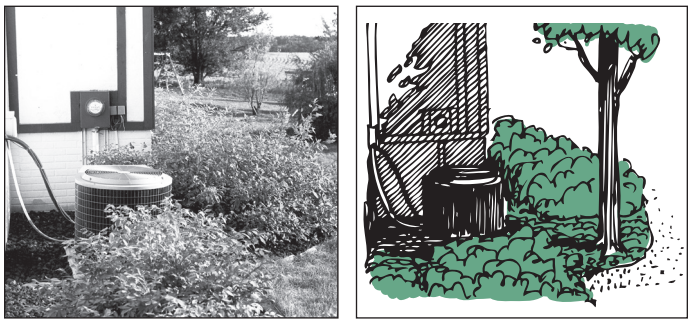
Savvy merchants realize that trees add value to downtown areas by making them more attractive places to shop. Trees also reduce air conditioning costs and lower the temperature of urban "heat islands." These and other benefits can be extended even further by using greenbelts to connect parts of town or even adjoining communities.

Reducing Air Conditioning Costs

Trees can reduce both monetary and environmental costs associated with summer cooling:

- by providing shade and reducing air conditioning bills. In some situations, savings of 58 percent of daytime air conditioning have been documented. In the case of mobile homes, the savings have reached 65 percent!
- by reducing the need for additional power generation. Where coal is burned to produce electricity, one additional pound of carbon is dumped into the air for each kilowatt-hour of electricity needed.

Trees can cool individual homes, businesses, schools, parking lots and other facilities, and collectively they can fight the "heat island" effect of urban neighborhoods or even entire communities. For more details on how trees are the "low tech" solution to energy problems, see *Tree City USA Bulletin No. 21.*

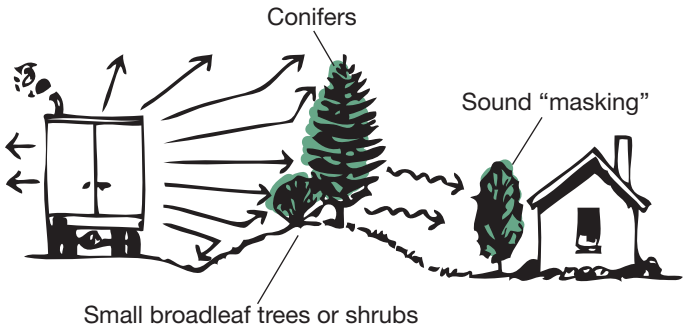


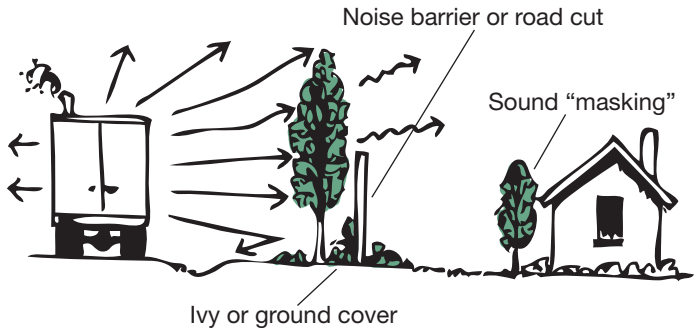
Shading a poorly-placed air conditioning unit is less expensive than moving it to the shaded side of a building. One or two trees or shrubs can often increase the unit's efficiency by ten percent.

Sound Barriers

Strips of densely planted trees and shrubs will not completely remove the annoyance of city noise, but they can significantly reduce it. Leaves are especially effective in absorbing high frequencies which are the sounds that human ears find most bothersome. Robert W. Miller's *Urban Forestry* (Prenctice Hall) provides summaries of research showing that even narrow belts of trees can reduce noise by 3 - 5 decibels. Combining trees with land forms such as mounds has resulted in reduction by as much as 15 decibels. When combined with solid noise barriers, trees not only help muffle objectionable sounds, they reduce the visual harshness of walls and fences.

Trees also improve the sound environment by "masking" unpleasant noise. The rustling of aspen leaves, for example, outside a window or beside a porch can actually replace other noise and make the setting more enjoyable.





Trees working in partnership with mounds and walls can reduce noise from highways, stadiums, playgrounds and other sources of bothersome, urban sounds.

The Practical Role of Community Trees Continued

Attracting Birds

The Garden Club of America estimates that a single Baltimore oriole can devour 17 leaf-munching caterpillars in a minute! Flickers clean up on ants — by the thousands — and a pair of scarlet tanagers was observed eating 630 gypsy moths in less than half an hour. Birds earn their keep. To make certain we continue to have birds, butterflies, and other desirable urban wildlife, it is essential to provide water, food and shelter. Trees can be selected to provide food and shelter, including nesting areas and cover for hiding. *Tree City USA Bulletin No. 13* provides more information, including a rich list of "how-to" publications.

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Other Uses of Trees

Can you think of other practical uses of trees in your community? This is an interesting question to present to school classes, scout groups and other youth. The answers can build quite a list on the chalkboard or flip chart. Here are a few more uses not included in this Bulletin:

- Boundary line demarcation
- Reducing stormwater runoff and cleansing urban waste water
- Reducing glare from buildings or other bright objects in daylight, and lights at night
- Reducing unused lawn space to make mowing unnecessary
- Filtering dust and absorbing air pollutants
- Improving property values for resale
- Odor modification
- Directing the flow of vehicular traffic
- Blocking unwanted foot and bike traffic
- Visually reducing buildings to a more "human scale"
- Reducing stress in the home, work place and at hospitals and other institutions
- Improving social situations by providing pleasant places to gather and spend leisure time
- Providing greenbelts to connect communities or neighborhoods

Food!

Trees' first service to humans was providing fruit for food, and it remains today a viable use for trees in even the smallest nooks and crannies of a community. Dwarf trees—which produce apples, peaches, pears, cherries and plums of the same size as their larger ("standard") cousins — can be grown in spaces as small as 100 square feet.

At least one community feels entirely at home with the idea of putting trees to work for food. Even its street trees grow food! Village Homes is a 70-acre, environmentally-aware development near Davis, California. Years ago its managers made an agreement with the City of Davis to maintain the city right-of-way along the edge of the enclave if the homeowners could plant and use trees of their choice. Their selection was almond trees, and every summer members of the homeowner's association harvest the bounty. A commercial operator's machine is brought in to shake the trees, then members do the gathering and drying. Whoever helps has the option of purchasing quantities of the almonds; the remainder are sold to a commercial processor. Profits are used to help maintain shared facilities in the development.

Village Homes also operates 20 acres of apricot, plum and cherry orchards where association members are free to pick what their families can consume. Citrus trees grace many of the "commons" shared by groups of eight housing units, with the fruit available for the use of those residents.

iStockphoto.com / Bart Sadowski

Trees for food becomes a practical idea in the city when dwarf stock is used. The trees bear full-size fruit yet can grow in the smallest nooks and crannies of land.

Trees, Young People and Other Benefits

A volunteer teaches members of the Milwaukee Community Service Corps how to identify trees. Lessons go beyond tree planting and care to the benefits provided by trees. The result is more trees in Milwaukee, new skills for unemployed young people, and a greater sense of work ethic.

We ask kids to be good — that's too weak. We should ask them to do good.

— Jack Calhoun, National Crime Prevention Council

Trees at work are arguably trees at their finest. But perhaps an even better benefit comes from using trees to help young people get a better start in life.

This view of trees can be seen at work in Milwaukee, Wisconsin, where a nonprofit organization for unemployed young people, the Milwaukee Community Service Corps (MCSC), has teamed up with the city's forestry division in a program called "Greening Milwaukee."

The philosophies of these two organizations came together nicely to make this possible. "We don't do anything without partnerships," says Preston Cole, Milwaukee Department of Public Works Director of Operations. And MCSC's goal for its 18-23 year olds: "Public work creating public good." The result has been a program that teaches corps members the basics of tree planting and care, and — if they complete the program successfully — offers financial assistance toward earning an associates degree in arboriculture which in turn can lead to a career in tree care.

Greening Milwaukee is an outgrowth of awareness of the need for working trees. In the 1960's, the city lost nearly 200,000 trees on public and private land. By the end of the century, aerial photos revealed that the total canopy area in the city covered only 16 percent of the surface. The goal is to raise this to 40 percent, on both public and private property, with a host of practical benefits resulting from the change. The figures and benefits were determined through a study by American Forests and are an education in their own right for the young people.

After training is received, service corps members are tested, then they help with various tree planting projects, including assisting physically-unable homeowners to plant trees on their property. Some corps members are selected for advanced training to help them evaluate lots and determine the best placement of trees for maximum energy savings. Recycling, lead abatement and other projects help the young people learn skills, gain a work ethic, and provide a start toward more productive lives.

Some Benefits of Greening Milwaukee

A study by American Forests in cooperation with the USDA's National Urban and Community Forestry Advisory Council showed that increasing Milwaukee's tree canopy from 16% to a more favorable 40%…

… will save homeowners $25.35 per year in energy savings.

… will sequester 4,793 tons of carbon.

… save the city $336,000 in cleaning up sediment from soil erosion.

… save the city $15.4 million in avoided water storage costs.

… raise property values, provide jobs and improve the quality of life.

A single sugar maple 12" in diameter and growing along a roadway removes in one growing season…

… 60 mg. of cadmium

… 1,440 mg. of chromium

… 820 mg. of nickel

… 5,200 mg. of lead

Make Food Part of the Urban Forest

Integrating food crops into urban forestry is an idea whose time has come. Where pedestrian safety or grounds maintenance is not a concern, fruit trees can double as street trees or landscape trees in yards and parks. Vacant lots can become community gardens and orchards. School yards can be used to teach children about growing fruits. The possibilities are endless and the benefits are significant. Trees in the city can provide fresh, wholesome fruits and nuts. They can help stretch budgets and in some cases even offer income.

The term 'permaculture' is often used to describe the philosophy of cultivating crops sustainably and integrating such practices on small acreages. In fact, the concepts have been successfully applied in urban areas as small as a front yard or even an apartment balcony.

For more information about permaculture and other aspects of working trees, please visit **arborday.org/bulletins** and click on Bulletin 39.

Fresh, wholesome fruits and nuts can be part of the working tree concept in urban areas. They also offer an opportunity to help young children learn about healthy foods.

John E. Rosenow, publisher; James R. Fazio, editor; Gerreld L. Pulsipher, graphic designer; Gene W. Grey, William P. Kruidenier, James J. Nighswonger, technical review committee. Special reviewers for *Bulletin* No. 39: William J. Rietveld, Jerry Bratton, and Kris M. Irwin, formerly with the National Agroforestry Center.

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