



# Understanding Trees and Utilities

TREE CITY USA®  
BULLETIN

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Editor: Dr. James R. Fazio • \$3.00



***I**t has been said that a tree worker in the utility business touches more trees than any urban forester and most arborists or even the most ardent tree lover. These hard-working men and women face extreme challenges and, in most cases, care about trees. They deserve respect and understanding.*

Dilemma, irony, and paradox are no strangers in the fields of natural resource management. A classic is the challenge faced by the National Park Service to preserve the delicate beauty of our scenic jewels while at the same time finding ways to make them accessible to thousands of people every year. Another classic is found in utility arboriculture — the challenge of providing safe, dependable electric or gas while at the same time protecting a community's trees. Unfortunately, trees can cause power outages when they're allowed to grow into wires or if limbs fall and break them.

When the pruners arrive on a street and the roar and grind of chippers disturb the tranquil setting in a neighborhood, residents are often alarmed and even angry. What many do not understand is the absolute need to keep tree limbs away from overhead wires. And until one gets to know utility arborists, it is easy to not appreciate the danger and pressures under which they provide service — let alone the fact that most appreciate trees as much as any of us.

The purpose of this bulletin is to better acquaint our readers with the utility industry and the men and women who are charged with guaranteeing the uninterrupted delivery of our utilities.

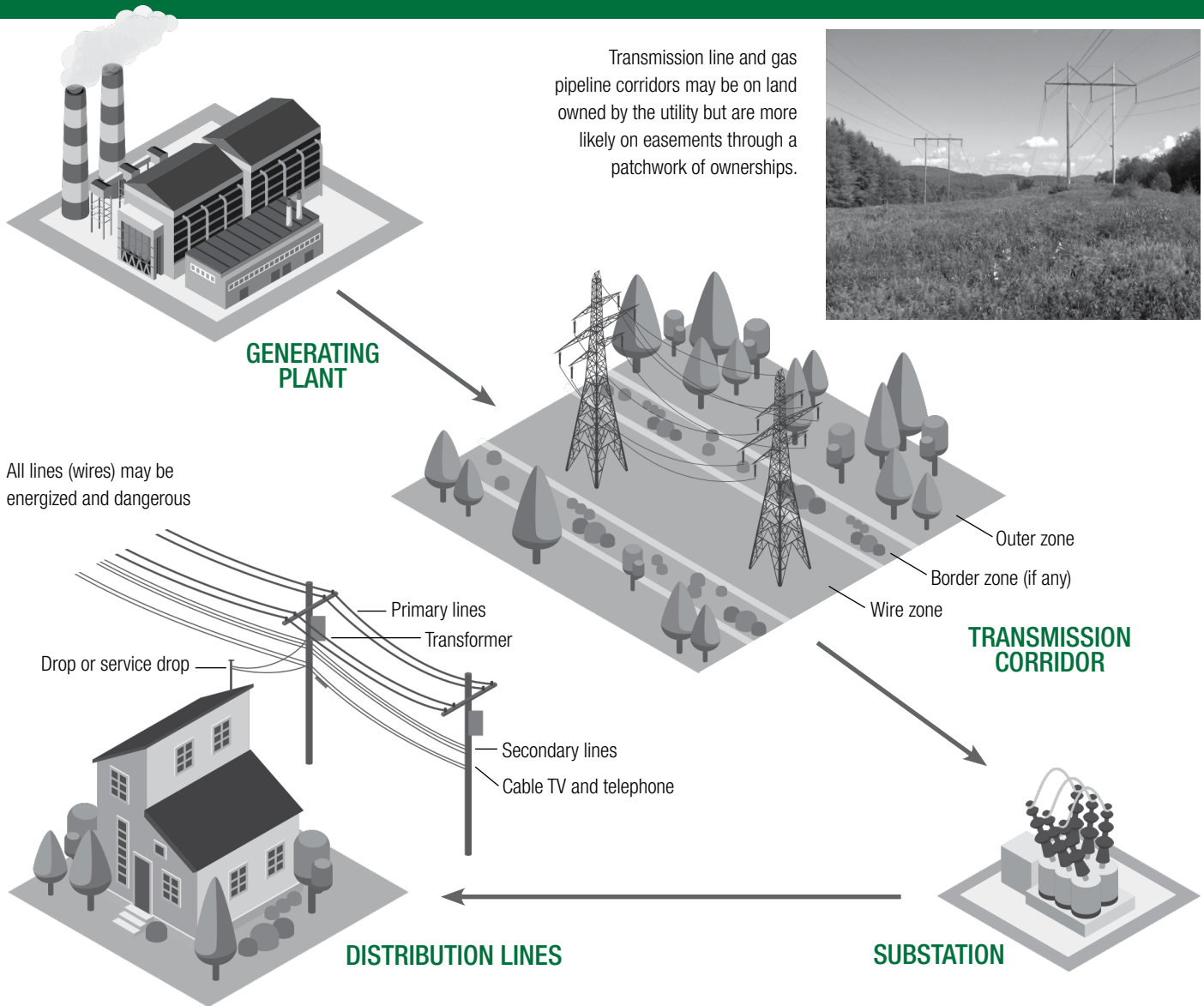
## THE CHALLENGES TO UTILITY ARBORISTS

- Delivering uninterrupted electric and gas service.
- Keeping workers safe in an industry said to have a risk factor 10 times higher than most.
- Keeping the public safe.
- Satisfying property owners whose trees are affected by pruning or corridor maintenance.
- Working compatibly with local officials, company employees, contractors, and others.
- Retaining employees whose work is outdoors in all kinds of weather, physically hard, and dangerous.
- Finding ways to dispose of pruning and removal debris.
- Avoiding the constant threat of litigation due to wildfire starts, personal injuries, and property damage.
- Operating economically to satisfy investors or member owners.



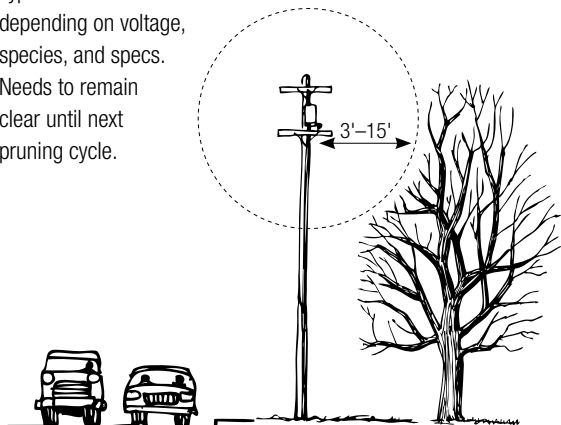
**Arbor Day Foundation**  
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# Utility Terminology and Concepts



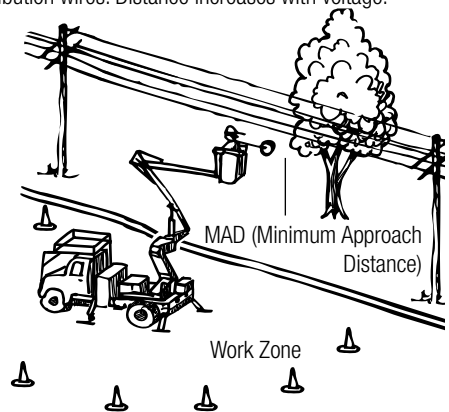
## CLEARANCE DISTANCE

Typical clearance of 3'-15' depending on voltage, species, and specs. Needs to remain clear until next pruning cycle.



## SAFETY IS NO. 1

- ANSI Z133.1 & OSHA 1910.269 standards and rules apply.
- Only qualified (trained) workers in a qualified company with proper equipment should work on limbs within 10' of distribution wires. Distance increases with voltage.
- ANSI Z133 standards for "MAD" depend on voltage and worker training.
- Indirect contact with energized wires through tree limbs, ladders, etc., can be as deadly as direct contact.
- Workers not trimming (and observers) should stay out of the work zone and two tree lengths from any tree being felled.



# Keeping Distribution Lines Clear and Serviceable

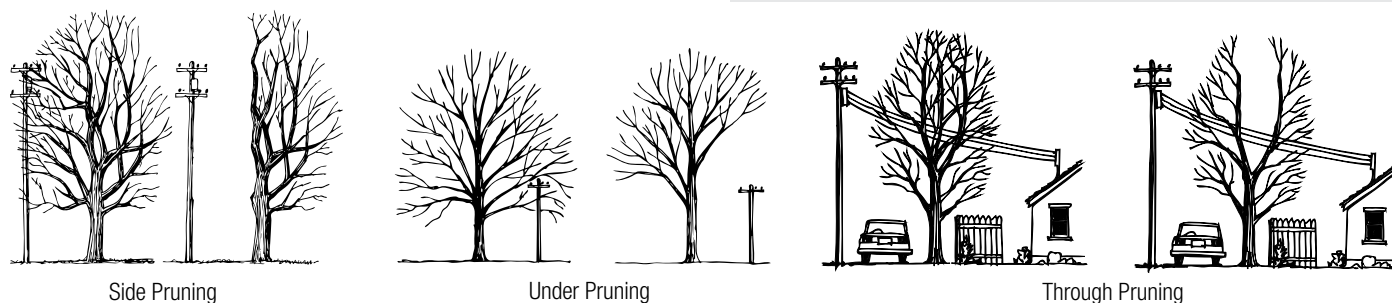
*The dilemma of providing uninterrupted service while respecting trees and the benefits they provide forces utilities to adopt a number of strategies.*

## PRUNING CYCLES AND BEST PRACTICES

Utilities inspect their lines regularly and conduct clearance pruning on three- to seven-year cycles. Contractors are often used, and the work is based on specifications that usually include having a certified arborist on the crew and following best management practices.

## DIRECTIONAL PRUNING

Where trees are intruding on lines, a compromise to removal is “directional pruning.” The resulting shapes sometimes create public controversy, but the alternative is to remove the tree. Here are some examples of directional pruning.



## WHY NOT PUT LINES UNDERGROUND?

This is a solution some places, but it can be disruptive to tree roots and a challenge to repair crews when problems arise. There is also the cost factor. From a comparison example in the September 2017 *Ruralite* magazine:

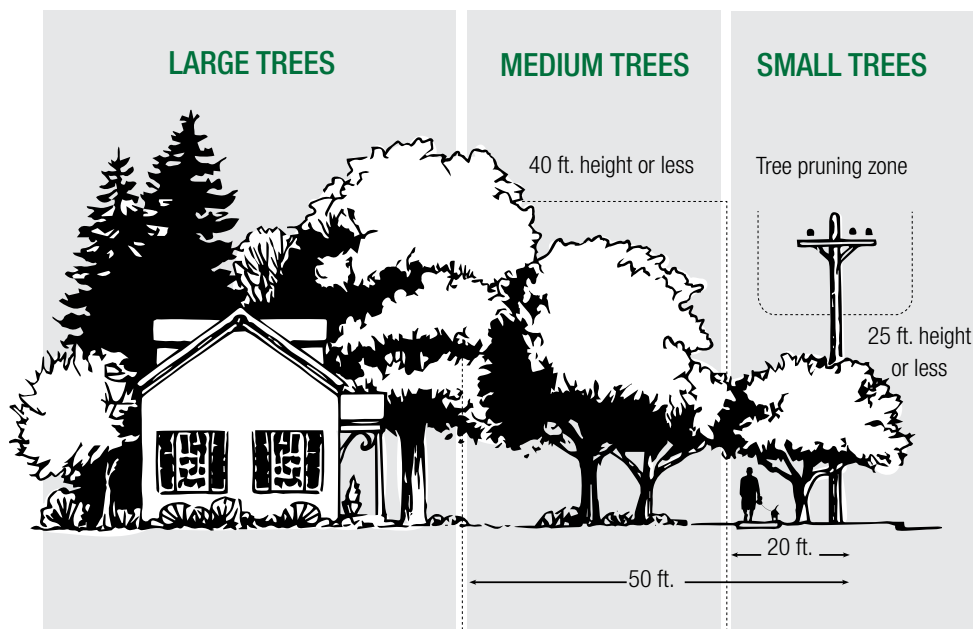
- \$131,000 per mile for overhead distribution lines
- \$327,000 per mile for underground distribution lines

In urban settings, underground costs may be 10 times higher than overhead lines.

## REMOVE AND REPLANT

When a utility faces the dangerous and expensive challenge of repeatedly pruning large trees, removal and replacement is often considered. In some cases, the tree may be old and eventually declared a nuisance, so the pre-emptive removal saves the homeowner the expense of removal. In any case, by replanting with a tree that matures below the overhead lines, the utility saves time and money in the long run. Some utilities either provide the homeowner with a voucher for use at a local nursery or may actually provide the tree and planting service. In most cases, this is a win-win situation.

The best solution to tree/utility compatibility is for the right tree to be planted in the right place.



# Managing Transmission Corridors

*There are approximately 150,000 miles of high-voltage transmission lines throughout the United States. With most being at least 150 feet across, this represents an expansive area of some 11 million acres. Importantly, this land is essential to the security of our nation's power grid — but it is also important to the integrity of our environment.*

## INTEGRATED VEGETATION MANAGEMENT

Many of the power companies that own the towers and lines are well-aware of their responsibility for resource stewardship along with keeping the lines safe from contact with surrounding vegetation. In fact, in recent years, utility arborists have developed management concepts under the heading of Integrated Vegetation Management (IVM). According to John Goodfellow, a pioneering proponent of these methods, they represent “a paradigm shift from control to management.” The bottom line of this approach is greater efficiency because the length of time between corridor treatments can be increased. The environmental and social benefits include reduced use of chemicals, improved wildlife and pollinator habitat, recreational opportunities like hiking and biking, and opportunities for compatible uses such as grazing, field crops, or Christmas tree production that contribute to the local economy.

In ANSI A300 (Part 7) and its *Best Management Practices* publication by Randall H. Miller, the International Society of Arboriculture defines IVM as “a system of managing plant communities in which managers set objectives, identify compatible and incompatible vegetation, consider action thresholds, and evaluate, select, and implement the most appropriate control method or methods to achieve their objects.” IVM is not a one-size-fits-all approach but rather uses site-specific prescriptions. It has been called “forestry in reverse” because the goal is not to produce tall trees, but rather to suppress them with other desirable vegetation. To accomplish this, a plan is developed depending on the area's ecology. It may include the selective use of herbicides. It can also include manual or mechanical methods, and sometimes it even means an attempt to create habitat for gnawing animals that help control tree growth. The overall goal is always to end up with a self-sustaining biological community of low-growing vegetation. It is a fascinating practice that is science-based and increasingly accepted by those who come to understand it.

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Agricultural uses can sometimes be the prescribed “treatment” for a segment of a well-managed transmission corridor.

## THE RIGHT-OF-WAY STEWARDSHIP COUNCIL

Utilities that meet IVM requirements established by industry representatives can become accredited by the Right-of-Way Stewardship Council. This opportunity is open not only to those utilities that manage transmission corridors, but also to the pipeline industry and agencies responsible for roadside management. Requirements are based on 10 principles. The first four are related to compliance with laws, management planning, community relations, and other internal matters essential as a sustainable foundation for the program. The other six, presented as follows, are especially pertinent to the environment and management of vegetation in the corridors. Each has a list of specific compliance requirements on which certification candidates are judged.

### *Understanding Pest and Ecosystem Dynamics*

Managers and practitioners are to be able to identify plants that are present in the corridor, both those that are incompatible and compatible with the overhead lines or buried pipelines. This foundational knowledge also requires an understanding of life histories and ecosystem processes and any associated effects from various IVM treatments.

### *Establishing Tolerance Levels*

Operational objectives of reliability, access, safety, and regulatory compliance are to be considered, as well as socioeconomic and environmental concerns. Then, tolerance levels (also called “action thresholds”) are used to schedule vegetation management actions when the levels are exceeded and at the optimal time for meeting the objectives.



### *Compilation of an Array of Vegetation Maintenance Techniques*

A complete array of treatment options that can lead to sustainable, compatible plant communities are to be considered. A treatment is prescribed only after considering all the viable options.

### *Accounting for Economic and Ecological Effects of Treatments*

Cost effectiveness and expected ecological effects over time are to be used as a basis for selecting treatments. The preferred approach systematically establishes compatible vegetation cover types that assist in reducing populations of incompatible vegetation on the right-of-way.

### *Site-Specific Implementation of Treatments*

Corridors are to be divided into vegetation maintenance units based on their operational, economic, ecological, and socioeconomic significance. Specific prescriptions are then made for each unit and records are kept of treatments to serve as benchmarks for future evaluations of effectiveness.

### *Monitoring and Adaptive Management*

Monitoring is needed to judge the success of decisions and effectiveness of treatments. This is a quality control and quality assurance program and serves as the basis for adjustments to better and more sustainably meet the organization's operational goals and objectives. This special effort at continuous improvement is referred to as "adaptive management."

For a more detailed look at each of the accreditation standards, the Right-of-Way Stewardship Council can be contacted at [rowstewardship.org](http://rowstewardship.org).

### **IS STEWARDSHIP COST EFFECTIVE?**

As a duty to their stockholders, owners, or members, utilities are expected to conduct their operations in a way favorable to "the bottom line." Fortunately, studies have shown that IVM provides significant long-term savings over control methods such as regular mowing or spraying. "This is the key to change in the utility industry," says consultant John Goodfellow. "It doesn't cost more to do the right thing."

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The judicious use of chemicals can be part of the practices allowed for certification by the Right-of-Way Stewardship Council if it meets specific objectives toward the goal of providing a self-sustaining, low-growing plant community.



# Doing It Right

*Besides staying solvent and viable, the bottom line for any utility is good service to its customers. Some do it better than others, and here is an example of one that excels in a number of ways. Rappahannock Electric Cooperative is a member-owned electric company that serves portions of 22 counties in Virginia. The content for this summary is taken from an article that appeared in T&D World magazine titled "Customers, Contractors and Communication" by company forester Cindy Musick. It is condensed here and used with permission.*

Every decision at Rappahannock Electric Cooperative (REC) is based on what is best for the members. REC has single-mindedness about a high level of member service and, not surprisingly, this mindset extends to the cooperative's vegetation management program. REC manages some 8,000 miles of overhead rights-of-way, including about 200 miles of transmission lines.

Here are three ways that REC's vegetation management program provides a particularly good example.

## WORK WITH CONTRACTORS

REC uses multiple contractors. This helps them hold each other accountable and keep prices reasonable. Pruning is done on a five-year cycle and written specifications are used that address trimming distances and growth rates, herbicide treatment, and danger-tree removals. The minimum distances required for pruning each tree are based on:

- Tree species (for example, a maple grows much faster than an oak)
- Type of overhead construction (wires and other equipment)
- High reliability zones (areas of a circuit from the station breaker to the first down-line operating device)

REC's contractors are trained not only in proper pruning methods — ANSI A300 and safety requirements Z133 — but also regarding how much growth can be expected from various species. Species and position relative to REC's facilities are the primary factors in determining the required clearance. Contractors also learn to look at growth over the previous five years to determine whether more clearance is necessary.

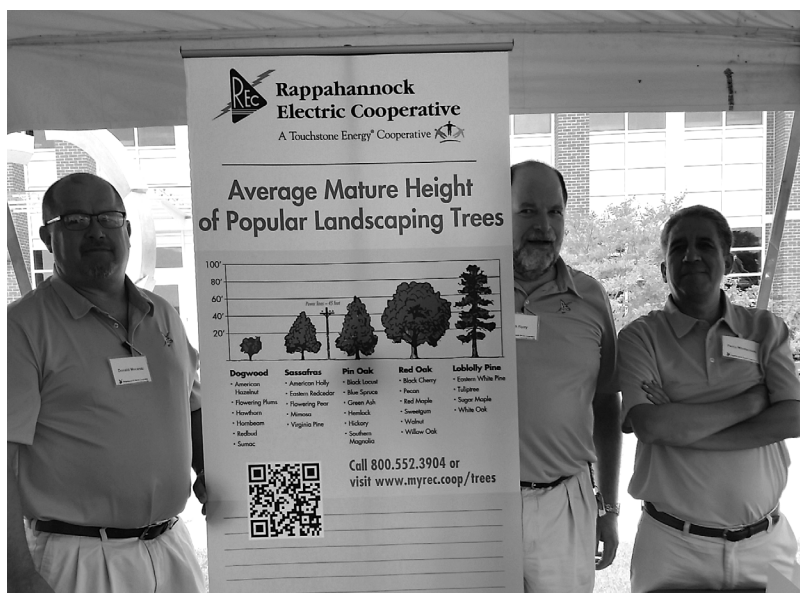
To encourage stability in the workforce, REC uses five-year contracts. It also has a bonus program and a celebratory breakfast for contract employees who meet quarterly production goals. In addition, there are incentives for safety and job attendance.

## HERBICIDES AS A TOOL

At REC, the use of herbicides is embraced to manage pollinator- and wildlife-friendly corridors, improve access, control invasive species, and prevent outages caused by trees and vines. Specifically, herbicides are applied to stumps to prevent re-sprouting, thereby reducing the workload in the following cycle. This also increases sunlight, which promotes native grasses and low-growing shrub habitat. Following scheduled clearing in corridors, a low-volume foliar application of herbicide is used to catch tall-growing species before issues arise with power quality. One of the many positive effects is the formation and maintenance of pollinator- and wildlife-friendly habitat.

Contractors are instructed to avoid properties where members choose to opt out of the treatment and signs are placed accordingly. Sometimes members change their minds after an explanation of the herbicides being applied and the desirable outcomes of their use. They are usually unaware and pleasantly surprised when they learn of the potential benefits, including vistas for viewing wildlife, increased berry bushes, and more birds.

Rappahannock utility foresters Donald Morcarski, Keith Forry, and Percy Montecinos attend an event called Get Connected, which was held for the company's member-customers.



## CUSTOMER SERVICE

One of REC's core values is customer service. The vegetation maintenance department recognizes the intrinsic value of treating others as they wish to be treated. Every interaction with members is handled in this manner, and a variety of techniques are used to communicate, including phone calls, texts, emails, letters, door hangers, and social media. REC's website also is updated as needed to reflect current practices. Members are notified by a postcard prior to the commencement of tree pruning and right-of-way work and by letter prior to herbicide application.

REC conducts phone surveys on its vegetation management efforts at the completion of each circuit. Members are asked about the effectiveness of notification efforts and the care taken by the crew working on their properties. Overall, the average rating of REC by members surveyed has been 8.7 out of 10 over the past five years. Comments like this are often received: "Working with REC has been great!" said Kyle Rhodes, land manager for the Smithsonian Conservation Biology Institute. "The quality and communication that they have demonstrated is excellent. From preparation to the cleanup, the work has been thorough and considerate of our site."

REC's vegetation management department is involved in numerous community outreach events and utility forestry recognition activities. For the 15th year, REC has been recognized by the Arbor Day Foundation as a Tree Line USA utility. Last year, REC participated in the Foundation's Energy-Saving Trees program by providing its members with 180 trees that will sequester more than 700,000 pounds of carbon. REC also participates in an Arbor Day celebration with a local school each year.

## THE BOTTOM LINE

REC's program has been successful largely because of thoughtful design and managers who understand the value of a well-funded, consistent program managed by professional foresters. Stable costs, improved reliability, and high member satisfaction all demonstrate the program's success.

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Providing habitat for butterflies is good public relations as well as good stewardship of utility corridors.



# What About Growth Regulators?

In the toolkit of utility arborists are tree growth regulators. These interesting compounds slow the elongation of twigs by 70 percent or more. This occurs by suppressing the production of gibberellic acid, the plant hormone responsible for cell elongation. There is a corresponding accumulation of compounds like abscisic acid and chlorophyll. The latter result has been shown to benefit trees by improving drought tolerance and disease resistance, reducing leaf scorch by reducing water loss from transpiration, and even enhancing growth of fine roots — all of importance to any property owner concerned with a tree health problem.

But what about slowing growth? Utility arborists are finding use of growth regulators as a way to increase the time between pruning cycles, especially on problem trees such as those that are large or fast-growing and too expensive or locally important to remove and replace. Don Mueller, a vegetation management specialist with Rainbow Tree Company, the designers of Cambistat® Tree Growth Regulator Solutions, believes there is a greater role for growth regulators in the future. “They have been inconsistent in the past,” he says. “Results are now much improved.” He also points out that the product is safely injected into the soil around the tree instead of being sprayed, and that homeowners are generally impressed when the benefits of growth regulators are explained.



one year's growth prior to treatment      one year's growth after treatment

The results of treatment by the tree growth regulator, Cambistat®.

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For additional information related to this issue, including the Arbor Day Foundation's Tree Line USA program and direct links to online sources, please visit [arborday.org/bulletins](http://arborday.org/bulletins).

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