Pointers for perfect pruning

When and how to prune all plants—from small flowers and shrubs to mighty oaks—and what tools to use.

■ The three primary reasons to prune plants are **(1)** to remove dead and diseased branches, **(2)** to control size and shape, and **(3)** to stimulate growth. Because it's a maintenance activity, the longer you put it off, the harder and more time-consuming it becomes.

Shade trees can be pruned high with thick crowns, so activities can take place under the shade. Windbreak trees can be pruned at the top to keep their fullness. Specimen trees can be pruned every year to maintain a thin, open crown and easily-viewed artistic form.

Young trees deformed by wind may be corrected by cutting back the leader and laterals on the downwind side (direction of lean) to more upright branches.

To make pines and other whorl-branched conifers more dense, you can pinch new growing tips (candles) in half, by hand, as they expand in the spring.

Pruning for size, however, is not acceptible, according to horticulturist Charles Owen of the Holden Arboretum, Mentor, Ohio. "It is infinitely better to select a plant for the available space than to select the wrong plant and to spend hours every year to keep the plant in bounds, a job which just gets more difficult and time-consuming every year," he says.

When to prune—Pruning to stimulate growth will be determined by the plant's characteristics and growing season. Spring-bloomers produce flowers on wood from the prior season. If you want a heavy flower growth next year, prune plants such as forsythia and azaleas, after the glory of their flowers have faded.

Summer-bloomers follow the opposite theory. Their flowers grow from new wood produced the same season. A late-winter pruning will encourage the growth of new wood and abundant flowers.

Evergreen trees generally need less pruning than deciduous trees. But when necessary, needle evergreens, such as pine and spruce, also prefer a late winter/early spring trimming just before their growth spurt. Avoid fall pruning of these evergreens.

Fall, however, is a good time to prune dead or diseased branches from spring-flowering trees and bushes. Late summer and fall blooming shrubs and perennials should also be trimmed once their flowers have fallen. If trees or shrubs are transplanted during the fall, cut back their branches to compensate for the roots that have been damaged. This will create less of a drain on the remaining root system and allow it to rebuild.

Heavy pruning is generally best done in late winter, when the plant is dormant and temperatures are above freezing.

"Pruning during the dormant season makes it easier to spot problem areas and place pruning cuts in trees that have lost their leaves," says Trevor F. Vidic of the Davey Tree Expert Co. "When new leaves sprout in the spring, they mask winter cuts."

There is some disagreement as to when trees that extensively bleed (exude sap) should be pruned. While Davey advocates winter pruning of conifers, maples, horse chestnuts, birches, walnuts and cherries, the American Horticultural Society suggests mid-summer pruning (after new growth has matured) because they bleed even toward the end of their dormant season.

Avoid topping—"Proper pruning should not be confused with topping," Vidic notes. "Topping removes a tree's main leader and branches, resulting in stubs." Topping severely disfigures trees and results in "watersprouts"—weak limbs that are susceptible to damage from high winds or other adverse weather. Topping may also harm the tree's natural defense system.

Pruning, on the other hand, doesn't harm trees, if done properly. However, a pruning cut is a wound, and it is important for it to close quickly.

The tools—One key is to use sharp tools that are large enough for the job.

Long-handled tree pruners are excellent for hard-to-reach branches. Loppers, which can extend your reach and leverage, should be used for larger branches up to two inches in diameter. Hand pruners can be used on stems up to 3/4-inch diameter, while hedge shears can be used on all hedges except larger woody branches.

Hand-pruners and loppers are available with either anvil or by-pass blades. Anvil blades have a more efficient cutting action and are used on dry, hard and old growth. By-pass blades give precise, clean flush cuts that are ideal for new green growth.

The cut—Never make a random cut along a branch. Cutting in the middle of a branch will cause it to wither beyond the bud, providing a home for insects and disease. Try to select a bud pointing outward or in the direction you want new growth to follow. Cutting back to a bud or branch will stimulate growth at this point.

On smaller plants, be careful not to cut too close or too far away from buds.

For trees, keep the cut as small as possible and avoid "tearing" the branch. Try to cut on a 45-degree angle with the lowest part of the cut directly opposite and

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slightly above the bud or branch of your pruning point.

On evergreens, do not prune into the inactive center of worl-branched conifers because new branches won't form to conceal the stubs. When a leader is lost, replace it by splinting to a vertical position the upper lateral on the highest branch. Prune all laterals immediately below the new leader.

A thinning cut removes an entire branch at its base. When you remove a scaffold branch, make the cut at the main trunk; when you cut a lateral away, make the cut at a strong main branch.

Heading a branch back keeps the shoot attached but removes the terminal bud and reduces the branch's overall length by one-fourth to three-fourths. Heading back produces a more bushy, dense appearance than thinning cuts.

Dr. Alex Shigo, a recognized national authority on trees, cautions against making branch-removal cuts that are flush with the stem or the trunk. Instead, he advises a pruning cut that leaves a small stub. Recent critics of Shigo's technique—which is based on plant physiology—advocate a cut between flush and Shigo's for aesthetic reasons.

Tips on cutting—

1) Use the one-third rules on trees. Never remove more than *one-third* of a tree's crown. Try to encourage side branches that form angles that are *one-third* off vertical. Ideally, main side branches should be at least *one-third* smaller than the trunk's diameter. For most deciduous trees, don't prune up from the bottom any more than *one-third* of the tree's total height.

2) Be sure to cut only the branch tissue, and not that of the stem or trunk. Also, be very careful not to injure the branch collar, cutting just beyond the collar ridges.

3) Always start by removing dead wood. Then remove damaged and diseased parts. Then remove water sprouts and suckers. Finally, deal with rubbing branches.

4) When sawing off a branch, support the part being cut so it doesn't rip the trunk's bark as it falls away. If the branch being cut is too heavy, use a double-cut. Make a preliminary cut one-third to halfway through the branch, cutting from underneath about six inches beyond the collar ridges. Next, make the first complete cut on the outer side of the preliminary cut. Saw until the branch falls cleanly away. Finally, make the second complete cut at the collar ridges.

5) Dip pruning tools in a disinfectant (undiluted alcohol or 10% solution of household bleach) after each cut when you work on infected trees to avoid spreading diseases.

—Sources: National Arbor Day Foundation, Holden Arboretum, The Davey Tree Expert Co., The Garden Council, Virginia Tech, The American Horticultural Society, Fiskar's Inc.

Cabling, bracing trees properly protects long-term 'investment'

Cabling and bracing can support both trees and your bottom line—but make sure you know what you're doing.

by James E. Guyette

■ Tree care companies that provide cabling and bracing services can support at-risk trees, along with the company's bottom line.

"It can be a real profit-making operation," says Dr. Kenneth C. Miller, a tree pathologist with Miller and Associates, Ravenna, Ohio. "An $80 to $90 cabling job is not uncommon, and it will preserve the aesthetic value of the tree, too."

This type of service "moves" best in upscale neighborhoods but homeowners need to be informed of the increased value involved. "That's something the company owner has to train the sales person in," says Miller. "It's something you're not going to sell in a blue collar area, but it works in a yuppie area quite well."

The benefit—"Trees are usually a long-term investment," points out Paul McFarland of McFarland Landscape Services, Philadelphia, Pa. "If clients want the beauty of the tree, they would invest in cabling to preserve the tree's structure."

In many communities, few tree care companies tackle cabling work. "Cabling and bracing is dragging its feet because people are afraid to get into it," says Dr. Alex Shigo, Shigo and Trees, Associates, Durham, N.H.

"I think cabling and bracing is an extremely good practice, but many people run from it because they don't know how to do it."

Not only must the people attempting cabling and bracing be experts at tree biology, but mechanical engineering skills are also required.

Be careful—Even a seemingly easy cabling job can bring trouble, too.

"They have to match all the coordinates together to get a good hold, (or else) they could really create a lot of damage," observes McFarland.

He knew one cabling job that went awry when the cable broke and went through a greenhouse.

Miller is even more explicit. "Landscapers should stick with dogwoods" or other easy-to-handle trees, he says. Using pole saws and ladders, a company can probably prune branches up to 20 feet high without harming the tree. However, cabling and bracing is a different story.

"I don't know if a landscaper wants to get involved with cabling," Miller notes. Even guy wire installation can be costly if attempted by someone without the proper training. "He or she is going to wind up girdling the tree."

"A mark of a professional is that he or she is able to make a decision," notes Shigo.

"You have to be brave enough to talk to the client and say, 'I'm going to assign risks. Here is a tree I will cable and brace—and here is a tree I will not cable and brace.' If the client wants something else, get it in writing."

—The author is a freelance writer specializing in the green industry. He is based in South Euclid, Ohio.

Monitor potassium levels for healthy turfgrass

A healthy grass leaf contains 2.5 to 3.5 percent of potassium. The growing medium and cation exchange capacity are keys to potassium content.

■ Most soils contain relatively large amounts of potassium (K^+)the essential element for plant growth, often in quantities as much as two percent of the weight of the mineral portion.

At the same time, the concentration of potassium in the soil solution from which the grass draws its needs may be only 50 to 100 parts per million.

This relationship illustrates the reason why the total chemical analysis of a soil has little correlation with its ability to supply grass with a nutrient and why soil testing procedures were developed which were more closely related to plant growth.

The potassium in the leaf is not associated with the structure of any specific compound such as protein or carbohydrate in the leaf. It appears as a free ion in the cell sap and helps maintain the ionic and pH balance within the cell as well as with some enzyme functions.

In fact, when a leaf dies, most of the potassium contained in the leaf will be leached out by the rain and returned to the soil.

The major portion of the potassium in the soil is found as an element in the structure of clay minerals and sand grains originating from the mica and feldspars in igneous rock.

Over many years, the potassium-containing minerals mica and feldspars break down. The potassium released due to this breakdown may become part of the structure of secondary minerals known as clay minerals or become exchangeable ions in the soil solution.

The potassium which is part of the clay structure is considered slowly available to the soil solution and can slowly recharge the potassium in the soil solution over a period of weeks or months. The rate at which the restructuring or breakdown of clay minerals releases potassium is known as the potassium supplying power, and can vary significantly between soils.

Potassium taken up by the plant is composed of potassium in the soil solution and the exchangeable potassium.

Cation exchange—Cation exchange occurs when compounds or minerals are surrounded by a sphere of negative electrical influence.

This gives them the ability to attract positively charged ions. Ions such as potassium, calcium and magnesium carry a positive charge, and are attracted by the negative charge the same way the north pole of a magnet attracts the south pole.

Cation exchange is also a property of large organic matter molecules, particularly when present as humus, because they also have a negative "sphere of influence" Since clay minerals and humus have a negative sphere of influence and therefore attract cations, the cations are held from leaching in the percolating ground water.

Cation exchange capacity—The ability of a soi lto retain all cations by the exchange system is called its cation exchange capacity (C.E.C.). The CEC of a soil depends on the amount of organic matter, the amount of clay and the type of clay found in the soil. The silt and sand fractions do not have a negative charge, so they have no effect on the CEC.

The type of clay mineral which makes up the clay fraction has a large influence. Clays found in the tropics tend to be the kaolinitic types with a low CEC. Clays found in the temperate regions such as Canada have illite to montmorillonite type clays and thus are more fertile due to a higher CEC.

There is little the turf manager can do to alter th eamount or type of clay in his soil. He can, however, increase the humus content by returning clippings, top dressing with composted organic materials and use management practices which favor a dense, deep root system.

Don't look for immediate results; this is a slow process.

Sports field CEC—Sports fields builts on an all sand rooting medium will have a very low CEC as evident from the above discussion. The lack of any CEC in sand is one of the reasons many designers will advocate the inclusion of a small amount (three to 10 percent) of natural top soil in the mix.

Attention to the potassium nutrition of turf growing on a sand system is critical. More frequent applications will be required. A soil testing system will give a reading on the potassium primarily in the soil solution, potassium which may be quickly lost by excessive rain or irrigation. There will be little reserve in the cation exchange system.

The turf manager must decide the economics of frequent light applications of soluble forms of potassium versus the cost of the coated materials. There is little research available to guide him regarding the application timing of slow-release potassium.

All potassium fertilizers, with the exception of controlled release forms, are water soluble. As a result, they can cause foliar burn when applied at high rates or where there has been an over application due to equipment failure or operator error.

—by R.W. Sheard, P.Ag., writing in the Sports Turf Newsletter.

HUMUS/CLAY MINERAL POTASSIUM RETENTION THROUGH CATION EXCHANGE

	(grams potassium/kg. material)
Humus	78
Montmorillonite clay mineral	39
Illite clay mineral	15.60
Kaolinite clay mineral	3.12
Sandy loam low in organic matter	0.76
Sandy loam high in organic matter	3.90
Clay loam with kaolinitic clay mineral	1.56
Clay loam having illite clay minerals	21.45