PRUNING

TREES & SHRUBS

Tools to Make the Cut

Many different pruning tools are available in the trade. The types of tools you will need depend on the size of the plant you intend to prune. Quality and price vary dramatically among tools.

Here we offer tips on selecting the right tool for the job and for evaluating a tool's quality. Check the feel of several styles, as each design is unique. Any tool can cut, but if it is not comfortable to use, then it is of little use. High quality tools will cost more but will last longer if taken care of and are often worth the expense.

Figure 2.1. Two types of "anvil" style pruners. The top picture shows the traditional style with a flat blade and anvil. The bottom picture shows the style with a curved blade and anvil.

Figure 2.2. Bypass shears are by far the most commonly used hand pruners. You can easily maneuver these into small branch angles to obtain an accurate cut.

Pruning shears

We use pruning shears to cut small limbs, typically less than ½-inch in diameter. There are two styles of pruning shears: anvil and bypass. Anvil style shears have one sharpened blade that cuts into a thicker, flat anvil (Figure 2.1.).

Many people consider anvil shears to be poor quality tools. This is not necessarily true. Newer designs have a curved blade and anvil rather than the typical flat style, and this means a much cleaner cut (Figure 2.1).

Select a brand made with high quality steel that fits your hand well, has a slim cutting-head, and a curved blade or anvil that prevents crushed stems.

Bypass shears work almost like scissors. They have one sharpened blade that slices past the curved anvil (Figure 2.2). When sharp, they make clean cuts and get into small branch angles easily. Some shears have a hooked end to prevent branches from slipping, while others have a *ratchet* action to cut through slightly

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larger diameter stems. There are numerous brands available for both anvil and bypass shears, ranging in cost from about $25 to more than $90.

Loppers

Use loppers to prune branches ½-inch to about 1½-inches in diameter. Loppers also come in anvil or bypass style, and some brands may have ratchet action available. They are also available in various lengths—from about 20 to 40 inches. Some styles have handles that telescope for a longer reach, and some have a fixed length. Any extra mechanisms, such as gears or ratchets, add weight that can make the tool cumbersome if working for long hours and often raise the price.

For big jobs, there are also pneumatic, hydraulic, and electrically operated shears or loppers. Again, weigh the pros and cons of each brand and style, try them out if possible, and select the best tool you can afford for the types of jobs you most commonly encounter.

Figure 2.3. Twenty-four-inch bypass loppers

Handsaws

When cutting larger branches and limbs (more than 1½-inches in diameter), you will likely need a pruning saw. If there is a question as to whether the job calls for loppers or a handsaw, it is often best to choose the saw. The saw can get into tighter places and makes a much cleaner cut with less likelihood of crushing plant tissue. There are a number of brands, lengths, and styles. Some have a hooked end to help keep the saw in the cut; some have a curved blade, while others are straight. Most of the newer saws have blades that cut only on the pull stroke. This means you can put more power into the cut and wield greater control.

Figure 2.4. Two types of turbo handsaws (top)—both cut on the pull stroke. Close-up of a tri-cut or turbo blade (bottom).

Designers refer to these saws as turbo, tri-edge, and three-angled. The teeth are three-beveled, which allows for a fast, smooth cut with little clogging or gumming. There are a number of excellent options available. Prices vary quite a bit—from less than $15 to more than $100. Try several saws, and select the one that works best for you. When you buy a saw, be sure to purchase a scabbard to protect your investment. Many of the good saws come with a scabbard made for that specific model.

Figure 2.5. Most scabbards have a loop that allows you to attach a saw to your belt or a climbing saddle.

Bow saw

Bow saws have a straight, sharp, quick-cutting blade. Most people do not use

these for pruning because the shape prohibits use in tight branch crotches. Use a bow saw to cut downed wood, debris, or firewood (if you are looking for a good workout!).

Pole pruner or saw

If you need to cut above your head, select a pole saw or pruner. The one you use depends on branch size, branch angle, angle of cut, and the purpose of pruning. Working above your head is challenging for many reasons. It is hard on the neck, arms, and upper back. Be sure to take sufficient rest breaks to minimize any long-term injuries. In addition, it is difficult to achieve the proper cutting angle. Therefore, the pruning wound may not be properly located. Do the best you can, or hire an arborist to climb the tree. You can also rent a "cherry picker" or bucket truck to prune taller trees, both of which get you closer to the branches and make pruning much easier.

Newer pole saw and pruner designs use relatively rigid aluminum. The poles come in sections, are quick locking, and are oval shaped, which allows for smooth sliding through your hands and easier cutting. Fiberglass is lighter but very flexible, which makes control more challenging. *Dielectric* fiberglass poles made especially for tree clearance work do not conduct electricity, and the aluminum poles often have a handgrip made of nonconductive material. However, you MUST BE specially trained and certified to work around electrical utilities (a person who does this is called a *utility arborist*). Without such training, bring in a *certified arborist* with the proper accreditation. This is true no matter what work you are doing around electrical lines! To learn more about hiring a certified arborist or tree care professional, see *How to Hire a Tree Care Professiona*l (NC Cooperative Extension publication AG-691) by Dr. Lucy Bradley and Karen Neill: http://cals.ncsu.edu/hort_sci/extension/documents/ag-691.pdf

Chainsaw

Chainsaws are highly efficient, albeit potentially dangerous tools. Most arborists or tree climbers use chainsaws quite skillfully to remove and prune larger trees and limbs. You should use a chainsaw only after proper training. If you are the foreman, you must ensure your employees are properly

Figure 2.6. Pole saw (*photo courtesy of ArborTech Supply*)

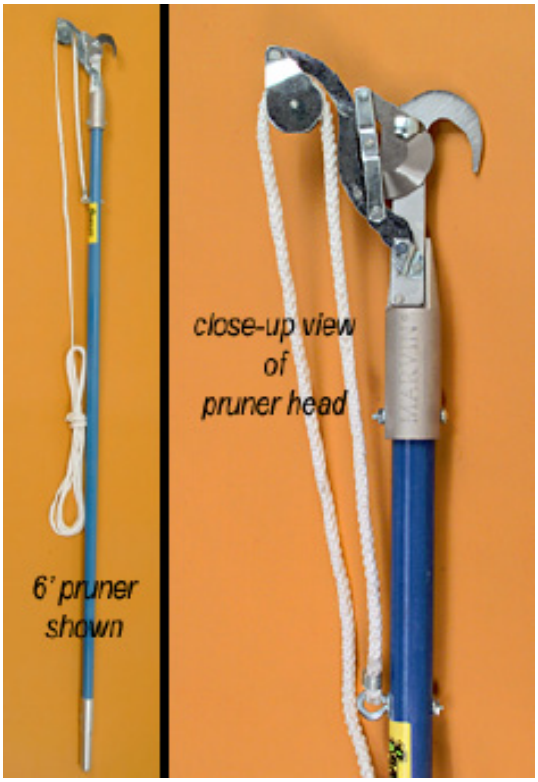

Figure 2.7. Pole pruner (*photo courtesy of Bartlett Arborist Supply & Manufacturing Co.*)

Figure 2.8. Gas powered pole saw (*photo courtesy of Alibaba.com*)

photos courtesy of Product WiKi

trained in the safe use of chainsaws according to Occupational Safety and Health Administration (*OSHA*) standards. Chainsaws are invaluable when doing prolonged pruning of large diameter limbs and ground clearance work. Clearing brush is one of the most dangerous landscape maintenance tasks. Remember, as with any thing you do in the landscape, use *proper personal protective equipment* (PPE). For clearing brush, this may mean chaps in addition to ear and eye protection, and gloves (in some cases). When using a chainsaw or gas-powered pole saw, you must wear basic PPE.

There are numerous chainsaw brands available. Select the one that fits your needs and budget. Prices vary dramatically.

For consumers with only occasional cutting needs:

Most homeowners need a chainsaw to clean up after a storm, remove small trees or large shrubs, and to cut firewood. If this is the case, you do not need a professional grade chainsaw; you need an easy-starting engine and basic safety features. Select the size saw for the size material you will be typically cutting. Invest in safety versus size. It is unlikely you will need a chainsaw with a bar length of over 16 inches for most common household uses. A chainsaw has three major components—an engine, bar, and chain. Most manufacturers design chainsaws with numerous safety and ease-of-use features. Gas chainsaws have a *two-cycle engine* that requires a mixture of gas and oil in the tank. This mix supplies fuel and lubrication so you do not need to perform oil changes. There is also a portal to add bar oil, which ensures the cutting chain slides smoothly. Select a chainsaw model that has an automatic bar oiler and a vibration dampening feature. Weights will vary based on the size you need, but the vibration is what will really tire you out!

A real necessity is a chain break. One of the most common causes of serious chainsaw related injuries is due to *kick-back*. Kick-back can occur when the moving chain at the tip of the guide bar touches an object or when the tip is pinched by the wood. These actions can cause a very fast reverse action, sending the bar up and back toward the operator. This can cause you to lose control of the chainsaw and lead to serious injury to you or anyone around you. The chain break stops the chain, thereby reducing the extent of injuries.

A well-maintained chainsaw will last for years. Learn how to clean it, replace the spark plug, sharpen the blades, change and adjust the chain, and complete other maintenace tasks.

There is nothing wrong with selecting an electric chainsaw, particularly if you infrequently need one. Consider the following before deciding on an electric or gas-powered model.

1. An electric chainsaw has less power and will increase the time you spend cutting. Less power, however, does not mean that you should be less vigilant about safety!
2. Electric saws are not designed for prolonged use or cutting large material.
3. You often have only 100 feet of cord.
4. Electric saws are often lighter and may offer greater safety features.
5. Electric chainsaws are typically cheaper and require less maintenance.
6. Electric saws are great for small, infreguent tree and shrub projects.

photo courtesy of International MotorSports LLC

For professionals:

Professional chainsaws offer different features. Professionals use chainsaws when climbing in a tree, which requires a light weight model, and to cut down large trees, which requires a large chainsaw with a long bar. Manufacturers design these chainsaws to run every day and operate all day. They have a very rugged design.

Some models have a top handle. These models are often lighter weight and allow for greater mobility and accuracy when pruning tree branches. Make sure the saw you select has a balanced design. One with the engine inline directly behind the cutting bar offers the most balance and makes it easier to hold, thus reducing hand stress.

top handle chainsaw model (*photo courtesy of www.chainsawsdirect.com*)

Many professional grade models also offer two-year commercial-use warranties. These are hard to find, but important when using your chainsaw eight hours or more every day.

Figure 2.9. Two manual hedge shears. The one on the left has a straight blade, while the one in the middle has a wavy blade. Gas-powered hedge shears (far right) are invaluable when it comes to managing large properties.

Hedge shears

Most landscapers have some type of formal shrubs to maintain, so hedge shears are a necessary tool. You can find hedge shears in gas- or electric-powered and manual models. Which you choose depends on how many plants need shearing. Most professionals have both on hand. The key to quality projects is to ensure your shears are sharp, particularly the manual version. Manual hedge shears come in several lengths with either straight or wavy-edged blades. Some users find the wavy edged style cuts better. Manual hedge shears cost about $20 to $90, while the gas-powered models will run about $150 to more than $400. Shears are also a great tool for cutting down grasses and large perennials.

Finding the right tool at the right price is easy with so many different brands and models available. A visit to a home show or industry trade show will give you the chance to try out several different products. Check out reviews of makes and models online. There are many online and mail order catalogs available as well.

Once you have invested in high quality tools, you are just about ready to head outside. Be sure to check out the rest of the pruning publications in the "Pruning Trees & Shrubs" series to learn more:

Before the Cut (AG-780-01)
General Pruning Techniques (AG-780-03)
How to Prune Specific Plants (AG-780-04)

This series is a revision of a previous publication:

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Important Terms

certified arborist—A person who has received certification from the International Society of Arboriculture (ISA) confirming that they have the technical knowledge of tree care practices. In addition, they have passed a rigorous exam, have worked in the industry for a number of years, and maintain their certification through continuing education programs.

dielectric—An electrical insulator that can be polarized by an applied electric field. When a dielectric is placed in an electric field, electric charges do not flow through the material as they do in a conductor.

kick-back—When the teeth on a chainsaw's chain catch on something as they rotate around the tip of the blade. The teeth may have enough force to cause the blade to kick back violently toward the operator. Three situations that can cause kickback are when the nose of the blade strikes another object, starting a bore cut improperly, or when the blade nose or tip catches the bottom or side of a saw cut during reinsertion. The best defense against kickback is to keep the tip guard on the chain saw. Some kickback control can be maintained by keeping a firm hold on the saw and using a saw that has a chain-brake or kickback

guard. Always be watchful for blade-pinching situations and plan accordingly. Cut branches at the base of the blade; don't saw with the tip of the blade. Use a high chain speed when reinserting the blade in a cut or removing it from a cut. Keep the saw teeth sharp so they will cut. Dull teeth are more likely to cause a kickback. Always cut below shoulder height, otherwise the saw is difficult to control and is too close to your face.

OSHA—Occupational Health and Safety Administration; with the Occupational Safety and Health Act of 1970, the U.S. Congress created the Occupational Safety and Health Administration to ensure healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education, and assistance. OSHA is part of the U.S. Department of Labor. The administrator for OSHA is the assistant secretary of labor for Occupational Safety and Health. OSHA's administrator answers to the secretary of labor, who is a member of the cabinet of the president of the United States. The Act covers employers and their employees either directly through federal OSHA or through an OSHA-approved state program. State programs must meet or exceed federal OSHA standards for workplace safety and health.

personal protective equipment—OSHA requires the use of personal protective equipment (PPE) to reduce employee exposure to hazards when engineering and administrative controls are not feasible or effective in reducing these exposures to acceptable levels. Employers are required to determine if PPE should be used to protect their workers. If PPE is to be used, a PPE program should be implemented. This program should address the hazards present; the selection, maintenance, and use of PPE; the training of employees; and monitoring of the program to ensure its ongoing effectiveness. For typical arboricultural applications, the following items may constitute PPE (depending on the job): safety glasses, hearing protection, chaps, face shield, gloves, climbing helmet, climbing saddle, ropes, safety vest, and steel-toed boots.

pollarding—Heading back all annual (or biannual) growth to the same point on a branch (scaffold branches typically), creating a knobby growth called the pollard head that will sprout again the following year; not to be confused with topping that removes branches to a different point on the branch each year.

ratchet pruner—Pruners that use a ratcheting mechanism that allows continuous cutting motion; increases cutting power without requiring additional hand strength.

two-cycle engine—A type of internal combustion engine that completes a power cycle in only one crankshaft revolution and with two strokes, or up and down movements, of the piston (in comparison to a "four-stroke" engine that uses four strokes to complete a power cycle). A two-stroke cycle is accomplished by the end of the combustion stroke and the beginning of the compression stroke happening simultaneously and performing the intake and exhaust functions at the same time. Two-stroke engines often provide high power-to-weight ratio, usually in a narrow range of rotational speeds called the "power band," and compared to four-stroke engines have far fewer moving parts

utility arborist—A utility arborist or forester typically works at an electric utility company. Duties can include responsibility for all utility vegetation management activities and programs at the utility company. Workers entering at this level usually have a strong background in arboriculture, forestry, or both and a strong understanding of electric distribution and transmission systems.

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