



Powered Hand Tools Safety: Lawn Care Training Guide

Powered Hand Tool Care and Safe Use

In addition to rotary mowers, many powered hand tools such as string trimmers, lawn edgers, hedge trimmers, and leaf blowers are widely used in lawn care. While these devices are very useful in making jobs easier and more efficient, they can be dangerous if used without proper training and care. In 1989 the U.S. Consumer Product Safety Commission reported that power lawn trimmers and edgers alone have caused about 4,600 injuries annually that required medical attention. About one-third of these were eye-related.

String trimmers are known to throw stones, sticks, and other objects at high speeds. Lawn edgers with metal blades are capable of cutting through underground objects, splintering concrete, and causing sparks. Heavy hedge trimmers are known to cause accidents — particularly when operators are fatigued. Leaf blowers produce considerable noise, and they also throw small rocks and other objects at high speeds. Special care must be taken to prevent these types of accidents.

General Safety Rules When Operating Power Tools

- Read and understand the operators manual prior to operating power tools.
- Do not allow children to operate power tools.



- Make sure there are no bystanders, children, or pets within a 50-foot radius.
- Wear eye and ear protection equipment when operating power tools.
- Wear protective clothing. Long pants, closed-toe shoes, and gloves are recommended. Do not wear loose clothing or jewelry.
- Inspect the area where the power tools are to be used. Remove all stones, sticks, wire, and other foreign objects that could interfere with the operation and cause personal injury.
- Do not operate any power tool while under the influence of alcohol, medications, or drugs or when ill or fatigued.
- Never start a gasoline-powered tool inside an enclosed area. **Breathing exhaust fumes can be fatal.**
- Follow fueling and premixing guidelines strictly. Wipe up any fuel spillage and replace the fuel cap immediately to minimize potential for fuel contamination and explosion.
- Never leave power equipment unattended with the engine running.
- Remember that for all power equipment a “safety always” attitude is the best defense against accidents and injuries.

String Trimmers

A string trimmer — also known as a line trimmer, weed whacker, weed whip, or weed eater — is a hand-held device that uses a flexible monofilament line for cutting grass and similar plants around stationary objects. It consists of a cutting head on one end of a long shaft and a handle or handles on the other. Sometimes these trimmers come with a shoulder strap. They are usually powered by either an internal combustion engine or an electric motor.



Types of string trimmers.

Gasoline-Powered Trimmers

If the trimmer is powered by a gasoline engine, it will be located on the opposite end of the shaft from the cutting head. The capacity of these engines on string trimmers may range from 21 cc to 32 cc. Trimmers with small engines use 2 mm (0.08 inch) lines or nylon blades. On the other hand, trimmers equipped with larger engines may be able to operate 2.75 mm (0.11 inch) lines or metal blades. All trimmer heads are equipped with safety shields to protect the user. If the power units are two-cycle engines, they run on a gasoline-oil mix. All gasoline-powered trimmers are heavy and expose the operator to considerable vibration. Large trimmers are considerably heavier, and they come with a harness.

The primary advantage of gasoline-powered string trimmers is the freedom they provide to move around and to cover a larger work area without interruption.

Electric Trimmers

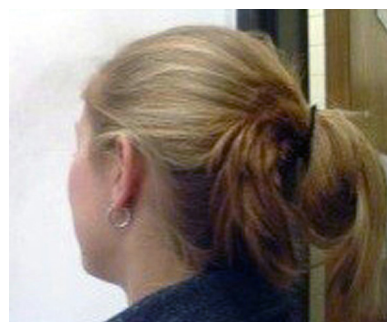
Electric trimmers are relatively light and easy to maneuver and operate. However, they lack flexibility, and the length of the power cord limits the area that can be covered. They are also generally less powerful and less robust than gasoline-powered trimmers. Because of their low power output (400 to about 1,200 watts), the lines on electric trimmers are limited to 2.5 mm (0.10 inch). However, the performance of newer models of electric string trimmers matches that of gasoline-powered trimmers.

Battery-Powered Trimmers

Battery-powered trimmers are also available. While these provide flexibility in terms of free movement, their weight and battery life (between charging) limit their acceptance and use. Lithium-ion batteries are recommended for extending the run time of battery-operated trimmers.

Safety With String Trimmers

- Inspect the trimmer for loose fasteners, fuel leaks, and for cracked or chipped string head before use. Replace all damaged parts and tighten all the loose parts.
- Secure long hair above the shoulder while operating a string trimmer.



Operators with long hair should secure it above their shoulders.

- Maintain balance and firm footing. Avoid over-reaching and always keep the string head below waist level.



Safe use of a string trimmer.

- Use the string trimmer only for grass and similar weeds.
- Watch for exposed electrical wires, communication lines, and extension cords to avoid damaging them.
- Do not remove protective guards and string guides.
- Check the trimmer string length periodically. Automatic-feed and bump-feed trimmers may release more string than needed. This increases the chances of striking the operator.
- Inspect power cords on electric trimmers for cuts, nicks, or scrapes. Replace damaged cords immediately.
- Do not operate electric trimmers in wet conditions.
- Unplug electric trimmers and turn off gas-powered trimmers for inspection, repair, and maintenance.

Lawn Edgers

A lawn edger is a garden tool used to separate a lawn from a walkway or other paved surfaces, such as concrete sidewalks or asphalt paths. Edgers may be manual or mechanical. Mechanical edgers are powered either by a small two-cycle gasoline engine or by an electric motor.

Gas-Powered Edgers

Gas-powered string lawn edgers were originally developed for commercial use. They are powered by

two-cycle engines and weigh 14 to 25 pounds. Lighter versions (10 to 14 pounds) are now available for non-commercial uses. The larger gas-powered lawn edgers have the capacity to cut a narrow strip between the grass and walkways with the string. Some of these units come with metal bush cutting blades as accessories for cutting small plants. Optional accessories may include blade attachments for other lawn and garden uses.



Proper use of a lawn edger.

Electric-Powered Edgers

The smaller electric edgers weigh approximately 3 pounds and generate about 0.10 to 0.125 horsepower. The cutting depth of these edgers may range from 7 to 12 inches.

Models with 0.75 horsepower electric motors may weigh 4 to 8 pounds, and they have the capacity to handle larger cutting lines (0.06 inch). They are capable of cutting swaths up to 16 inches wide. These larger units come with a second adjustable assist handle for better control. Both wider cutting radius and additional power allow these models to handle larger jobs more easily.



Electric-powered trimmer.

Safety With Lawn Edgers

- Check and make sure the edger blade and other parts are firmly attached. The blade should rotate freely without touching the housing.
- Do not use a lawn edger on gravel surfaces.
- Do not operate a lawn edger without protective guards or shields in place.
- Do not start an edger with the blade in contact with the ground so as to avoid uncontrolled movement and possible injuries.
- Watch for exposed electrical wires, communication lines, and power cords that could be struck by the edger.
- Operate the edger at full blade speed.
- Stay close to the curb to avoid accidents when edging along the roadways.
- Never leave a lawn edger running while unattended.
- Do not inspect, repair, or carry out maintenance work on a lawn edger with its power unit running.

Hedge Trimmers

Hedge trimmers are used for trimming and shaping plants with ease and efficiency. Powered hedge trimmers are faster and easier to operate than pruning manually with knives or shears. Their cutting mechanism is similar to that of finger-bar mowers. One of the safety features of the powered trimmer is that it operates only when the operator holds it with both hands.



Hedge trimmers.

Gas-Powered Hedge Trimmers

Gasoline-powered trimmers tend to be more powerful than electric trimmers. The downside is that they are generally heavier and are difficult to start. These devices, however, have the flexibility to cover a larger area without dragging a power cord.

Electric Hedge Trimmers

Electric trimmers are generally lighter and less polluting. They are less powerful than gasoline-powered trimmers. Additionally, the need to drag a long electrical cord to operate them makes them less attractive to users. When using electrical trimmers, operators must take extra care not to cut into the power cord.

Safety With Hedge Trimmers

- Check the hedge trimmer before use to ensure that all safety features are functioning as they should and there are no loose parts.
- Keep hands away from blade.
- Wear a dust mask to prevent inhalation of dust or smoke.
- Grip the hedge trimmer properly to avoid unwanted body stress. Maintain control without using an excessively tight grip.
- Make sure all screws, blades, or chains are secure. Vibrating equipment may loosen fasteners.
- Keep power cords away from the blades.
- Disconnect and shut down the hedge trimmer before inspection, repair, and maintenance.
- Do not leave a running hedge trimmer unattended.
- Never use an electric hedge trimmer overhead. If the trimmer becomes lodged, disconnect the power before trying to dislodge it.

Dangers associated with gas-powered hedge trimmers include:

- Make sure the fuel cap is tightly in place to avoid fuel spillage and fire.

- Do not refuel when the engine is hot to avoid possible spill and fire.
- Gas-powered trimmers are heavy and may cause operator fatigue.
- Never run a gas-powered hedge trimmer in an enclosed area to avoid carbon monoxide poisoning.

Dangers associated with electric hedge trimmers:

- Always track the power cord to avoid cutting into the cord.
- Always use GFCI (ground fault circuit interrupter) grounded outlets.
- Never operate an electric trimmer in wet conditions.
- Avoid coming in contact with the cord to avoid electric shock.

Leaf Blowers

Leaf blowers are used to collect leaves and yard debris rather than raking them manually. They generate air at high velocity through a nozzle to blow leaves and other yard debris. They are usually powered by either a two-stroke engine or an electric motor. Blowers with four-stroke engines are being introduced to reduce air pollution. Leaf blowers are either hand-held or back-mounted units. Some blowers also have the capability to suck the leaves and small twigs up and shred them into a bag when the operation is reversed.



Types of leaf blowers.

Hand-Held Electric Blowers

Hand-held electric blowers usually weigh about 7 pounds or less and are designed for one-handed operation. They have a push-button start, and they are emission-free. The disadvantage of the electric blower is that the length of the power cord limits its use. An electric blower works best if the work area does not extend more than 100 feet from the outlet.

Battery-powered units are also available to avoid the power cord limitation. They tend to be heavier due to the battery pack and have only limited life before the battery is discharged.

Hand-Held Gas Blowers

These are also designed for one-handed operation, and they provide maximum flexibility to move around while in use. Hand-held gas blowers are considerably heavier than electric blowers and may weigh 7 to 12 pounds. The engines on these units are generally two-cycle engines that run on a mixture of gasoline and oil. While blowers with four-stroke engines are known to be cleaner, they are substantially heavier than those with two-cycle engines. Considering that these machines are very noisy, use of ear protection is highly recommended.

Back-Mounted Gas Blowers

Back-mounted blowers are more powerful and are used more in commercial applications. They weigh approximately 15 to 25 pounds, and they are back- and shoulder-mounted during use. The units are also noisy and can only act as blowers. These high-capacity blowers are more expensive than hand-held blowers.

Wheeled Gas Blowers

These wheel-mounted units are particularly designed to cover large areas and are only capable of blowing. The large four-cycle engines run on regular fuel. They are bulky and relatively hard to maneuver, and they weigh more than 100 pounds. Like other gas blowers, wheeled units are noisy, and operators should wear ear protection.

Safety With Leaf Blowers

- Have a first aid kit available when operating a leaf blower.
- Store and handle fuel with care. Fuel is extremely flammable.
- Do not use the blower to clean debris off of yourself.
- Be aware of pedestrians and others in the area. Do not direct the blower toward pedestrians and bystanders.
- Prior to using an electric blower, inspect extension cords for cuts, nicks, scrapes, or exposed wire that could pose an electrical hazard. Replace damaged cords immediately.
- Do not operate electric blowers around water puddles or during wet conditions.

Garden Tillers

A garden tiller is a motorized machine that is generally used to loosen and turn the soil with the help of rotating blades. Most garden tillers are powered with small gasoline engines. They are used widely for preparing seedbeds and for cultivation.



Types of garden tillers.

Front-Tine Tiller

The front-tine tiller has tines located in the front of the tiller. As the tines rotate, the tiller moves forward. The wheels in the rear allow the operator to push and move the tiller forward. One disadvantage of the front-tine tiller is that in hard untilled soil, it has the tendency to skip and “walk” without tilling hard areas. However, this problem does not exist in loose soil. For a garden of reasonable size (fewer than 5,000 square feet) with loose soil, the front-tine tiller is a good choice.

Mini-Tiller or Cultivator

Small mini-tillers are lightweight, and they are an excellent choice for small gardens (fewer than 1,000 square feet) with soft soils. These machines are so light they do not need wheels to move around. Mini-tillers are designed to till 6-inch-wide strips between rows, and they work well in raised beds where only light tilling is needed. They are ideal for keeping the weeds down in long vegetable garden rows.

Rear-Tine Tillers

Rear-tine tillers are the best among tillers. These heavy-duty machines weigh as much as 200 pounds, and their tines are located behind the engine. These tillers are more difficult to maneuver, but they are well-suited for larger operations with hard soil. They often come with a push-button start and many accessories.

Safety With Garden Tillers

- Disengage tiller tines before starting the engine.
- Never leave a garden tiller unattended with the engine running.
- Never attempt to make any adjustments while the engine is running unless it is specifically recommended in the operators manual.
- Use only the attachments and accessories recommended by the manufacturer. Failure to do so may result in personal injuries.
- Be familiar with all the controls and their functions. Know how to stop and disengage the tiller quickly.

- Use caution when tilling near fences, buildings, and underground utilities. Rotating tines can cause property damage or personal injury.
- Do not overload the tiller by tilling too deeply or at a high speed.
- If the tiller experiences excessive vibration or it makes unusual noise, turn the engine off and disconnect the spark plug wire before inspecting or repairing the unit.

Resource

Smith, D. W. 2005. *Lawn Maintenance Safety*. Texas A&M AgriLife Extension. Publication E-356. <http://agsafety.tamu.edu/files/2011/06/LAWN-MAINTENANCE-SAFETY2.pdf>.

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