

Powered Hand Tools Safety: Lawncare Training Guide

Powered hand tool care and safe use

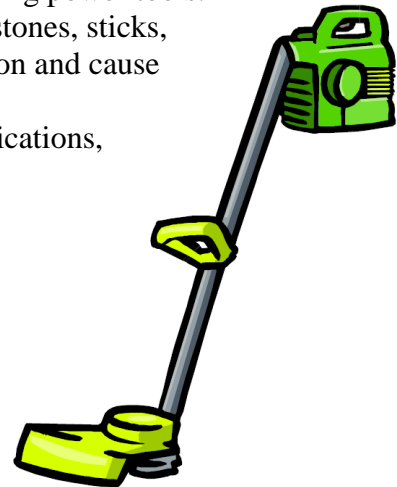
Power Tools

In addition to rotary mowers, many powered hand tools such as string trimmers, lawn edgers, hedge trimmers and leaf blowers, are widely used for lawncare purposes. While these devices are extremely useful in making the jobs easier and more efficient, they can be dangerous if used without proper training and care. In 1989, the US Consumer Product Safety Commission (CPSC) reported that power lawn trimmers or edgers alone have caused about 4,600 injuries requiring emergency-room treatment. 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, splinter concrete and cause sparks. Heavy hedge trimmers are known to cause cutting accidents particularly when the operators are fatigued. Leaf blowers produce considerable noise and they also throw small rocks and other objects at high speed. Special care must be taken to prevent these types of accidents.

General Safety Rules with Power Tools

- Read and understand the operator's manual prior to operating the power tools.
- Do not allow children to operate power tools.
- When operating power tools, make sure that no bystanders, children, and pets are within 50 feet radius.
- Wear eye and ear protection equipment when operating power tools.
- Wear protective clothing when using power tools. Long pants, closed-toe shoes, and gloves are recommended. Do not wear loose clothing or jewelry when operating power tools.
- 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 under the influence of alcohol, medications, and drugs or when the operator is ill or fatigued.
- Never start a gasoline powered power tool inside an enclosed area.
BREATHING EXHAUST FUMES CAN BE FATAL.
- Follow fueling and premixing guidelines strictly. Wipe up any fuel spillage and place the fuel cap back 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, 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 generally powered either by an internal combustion engine by an electric motor.

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 21cc to 32cc. Trimmers with small engines use 2 mm (0.080 inch) lines or nylon blades. On the other hand, trimmers equipped with larger engines, may be able to operate 2.75 mm (0.110) 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 gasoline-oil mix. All gasoline powered trimmers are heavy and exposes the operator to considerable vibration. Large trimmers, used on larger jobs are considerably heavier and they come with a harness. The primary advantage of gasoline 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, easy to maneuver and operate. However, they lack the 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 trimmers. Because of their low power output (400 to about 1,200 watts), the lines on electric trimmers is limited to 2.5 mm (0.10 inch). However, the performance of newer models of electric string trimmers matches that of gas powered trimmers.

Battery-powered Trimmers: Battery-powered trimmers are also available. While these provide the flexibility to move from place to place freely, both weight and battery life (between charging) limits their acceptance. Lithium-ion batteries are recommended to extend their run time.

Safety with String Trimmers

- Before use, inspect the trimmer for loose fasteners, fuel leaks, and for cracked or chipped string head. Replace all damaged parts and tighten all the loose parts.
- Operators with long hair must secure their hair above the shoulder while operating a string trimmer.
- When operating a string trimmer, keep firm footing and balance. Do not overreach and make sure that there is adequate space in the area of



operation. Always keep the string head below operator's waist level.

- Use the string trimmer only for grass and similar weeds.
- Watch for exposed electrical wires, communication lines and extension cords to avoid damaging them with the trimmer string.
- Do not remove protective guards and string guides.
- Periodically monitor the trimmer string length. Automatic-feed and bump-feed trimmers may release more string than needed. This increases the potential for striking the operator unexpectedly.
- When electric trimmers are used, inspect power cord/s for cuts, nicks or scrapes. Replace damaged cords immediately.
- Do not operate electric trimmers around water puddles or in wet conditions.
- Unplug electric trimmers and turn off gas powered trimmers for inspection, repair and maintenance.



Lawn Edgers

Lawn Edger is a garden tool used to separate a lawn from a walkway or other paved surfaces, such as a concrete sidewalk or asphalt path. 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: Gas-powered string lawn edgers were originally developed for commercial uses. These units powered by a two-cycle engine weigh about 14-25 pounds. Lighter (10-14 pounds) versions are now available for use around homes. The increased capacity of gas-powered lawn edgers allows the user to dig a narrow trench between the grass and the walkways with the string. Some of these units come with metal bush-cutting blades as accessories for heavier cutting. Optional accessories may also include blade attachments for other lawn and garden uses.



Electric Powered: The smaller electric edgers weigh approximately three pounds and they generate about 1/10-1/8 horsepower. The cutting diameter it can handle range from 7 to 12 inches. Models with 0.75 horsepower electric motors may weigh around four to eight pounds and they have the capacity to handle larger cutting lines (0.06 inches). They are capable of cutting swaths up to 16 inches wide. These larger units come with a second adjustable assist handle to permit use of the edger with two hands for better control. Both wider cutting radius and additional power will allow these models to handle larger jobs more easily.

Safety with Lawn Edgers

- Check and make sure the edger blade and other parts are firmly attached. The blade should rotate freely without contacting the housing.
- Do not use a lawn edger on graveled 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 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.
- When edging along the roadways, stay as close to the curb to avoid accidents.
- Never leave a lawn edger running while unattended.
- Do not inspect, repair or carry out maintenance 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 it is held by the operator with both hands.

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



Electric trimmers: Electric trimmers are generally lighter and they are less polluting. They are less powerful than gasoline powered trimmers. Additionally, the need for dragging a long electrical cord to operate makes it less attractive to the users. When using electrical trimmers, one must take extra care not to cut into the power cord.



Safety with Hedge Trimmers

- Check the hedge trimmer before use to ensure all of the safety features are functioning as they should and that 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 excessive 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 hedge trimmers with motor running unattended. The sharp blades on the trimmers may injure children and others.
- 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 trimmers.

- Unit vibration may loosen the fuel cap causing fuel to spill. Make sure that the fuel cap is put back in place tight to reduce the risk of 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 trimmers.

- Always track the power cord to avoid cutting into the cord.
- Always use GFCI grounded outlets.
- Never operate an electric trimmer in wet conditions.
- Do not come in contact with the cord to avoid electric shock.

Leaf Blowers

Leaf blowers are used to collect leaves and yard debris. They generate air at high velocity through a nozzle to blow leaves and other yard debris instead of raking manually. They generally are powered either by a two-stroke engine or by an electric motor. Blowers with four-stroke engines are being introduced to reduce air pollution. Leaf blowers are either handheld 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.

Handheld electric blowers: Handheld 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 with electric blower is that its use is limited by the length of the power cord. An electric blower works the best if the work area does not extend any more than 100 feet from the outlet. Battery-powered units are also available to avoid the power cord limitation. They generally are heavier due to the battery pack and have only limited life before the battery is discharged.

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

Back mounted gas blowers: These blowers are more powerful and they are used more in commercial applications. They weigh approximately 15 to 25 pounds and they are back and shoulder mounted during use. These units are also noisy and they can act only as a blower. These high capacity blowers are more expensive than handheld blowers



Wheeled gas blowers: These wheel mounted units are particularly designed to cover large areas and only for blowing. The large four-cycle engines on them run on regular fuel. They are bulky and they weigh more than 100 pounds and they are relatively hard to maneuver. 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.
- Fuel is extremely flammable. Store and handle fuel with care
- 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 bystanders and others.
- Prior to using electric blowers, 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 can be 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.

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 downside 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 (<5,000 square-feet) with good loose soil, the front-tine tiller is a good choice.

Mini Tiller or Cultivator: Small mini tillers are lightweight and they are excellent choice for small gardens (<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 inches wide strips between rows and they work well in raised beds where only a light tilling is needed. They are ideal to keep the weeds down in the 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. These tillers often come with a push button start and many other 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 operator's manual.
- Use only the attachments and accessories recommended by the manufacturer with the tiller. 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 tiller by tilling too deep or at a high speed.
- If the tiller experience excessive vibration or it makes unusual noise turn the engine off and disconnect the spark plug wire before inspecting or repairing the unit.

References

Smith, D.W. 2005. Lawn Maintenance Safety. Texas Cooperative Extension Publication Number E-356. The Texas AgriLife Extension Service, Texas A&M University System, College Station, TX, <http://agsafety.tamu.edu/files/2011/06/LAWN-MAINTENANCE-SAFETY2.pdf> (Accessed on October 24, 2011).

Credits

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