



## TREE CITY USA® BULLETIN

# No. 51

Dr. James R. Fazio, Editor • \$3.00

# Trees and Safety

There are few trees that do not require at least occasional pruning or other work. For the non-professional, such tree care can be enjoyable and rewarding. By the same token, it can cause serious injury or death. The difference is awareness and an attitude aligned with safe work practices. This bulletin presents some important ways to make certain that the work you do benefits not only the trees – but keeps you healthy, too.

If you are driving a car, it is far more likely you will have an accident close to home rather than on a long trip. Progressive Insurance found that nearly 70 percent of its customers that filed claims had their accident within ten miles of home. Part of the reason is that this is where most driving occurs. But there is another reason. We tend to become relaxed and distracted when things become familiar and routine.

Maintaining healthy trees requires care, and tree care can be dangerous business. Arborists and other tree workers face danger daily from falls, cuts, being struck by falling limbs, being caught in chipping machines and a host of other causes. But these men and women receive extensive training in how to work safely and they usually have the best of equipment to protect them. This bulletin is not about or for them. Instead it is for homeowners, volunteers and others who may work in an office one day and find themselves working on trees in the evening or on a day off.

The purpose of this bulletin is to raise awareness of the dangers involved in tree care and to present some basic methods for reducing the chances of getting hurt. Safety should always be the first concern when working around trees and it requires the same degree of constant alertness as driving a car or flying an airplane. With the right attitude and a few precautions, tree care can result in healthy trees without jeopardizing the health of the care giver. We hope that you will not only review this important bulletin, but also make copies available to volunteer pruners and others who do part-time work with community trees.



Courtesy of Jameson Corporation

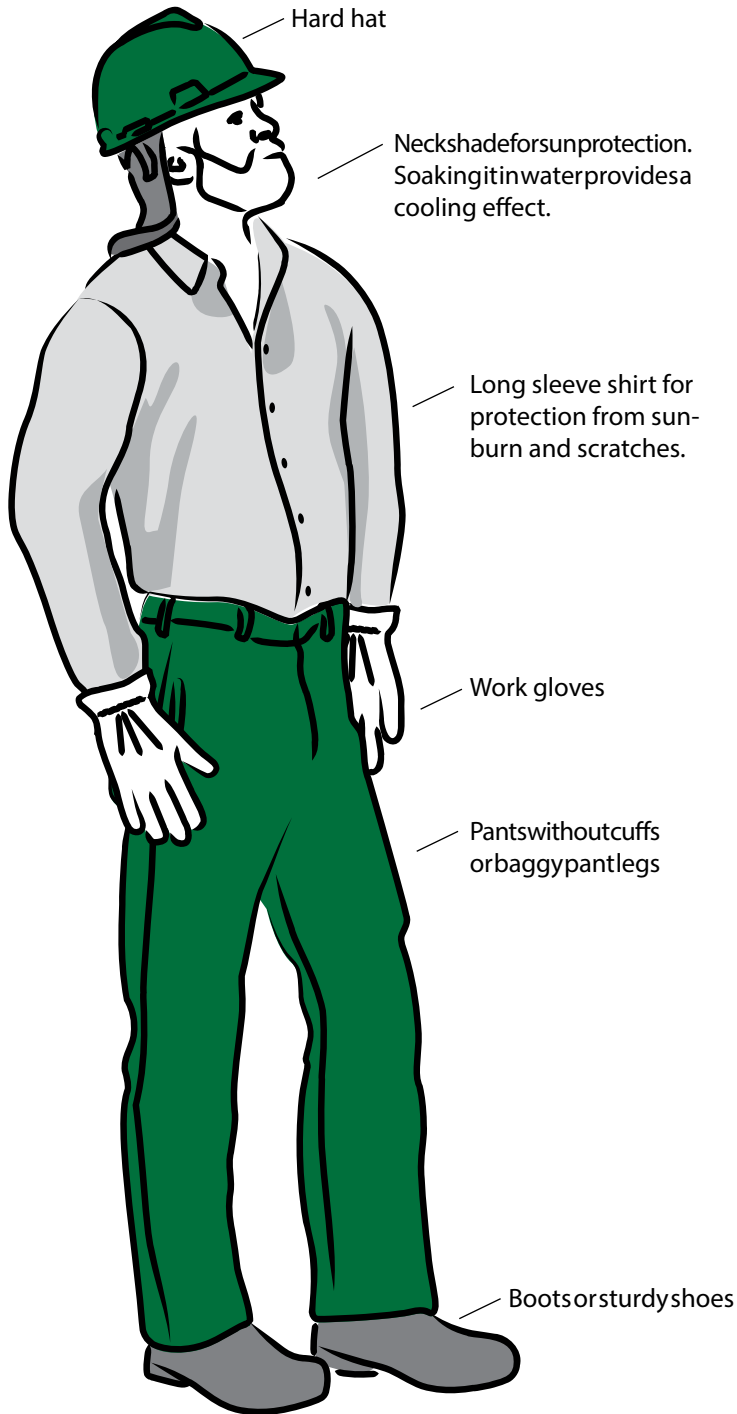
*Proper clothing, the right tools and some thoughtful caution are prerequisites to safe work around trees. The result can be healthier trees and good outdoor exercise for you.*

# Safety Begins With You

The right clothing, personal gear, some health considerations, and knowing your limits will go a long way toward preventing injuries.

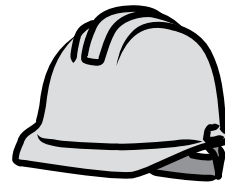
## The Well-Dressed Worker

What you wear when working on trees will depend on season and climate, but there are a few dress items that should be considered regardless of local circumstances:

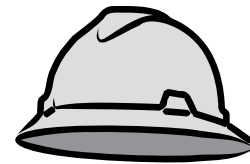


### Hard Hat

A pruned or broken limb dropping even a short distance can cause a serious head injury. For this reason, a hard hat should be worn by volunteer tree pruners or when working on trees around the house. Modern hard hats are light weight with adjustable suspension to separate the hat from the head. Full-brim models offer more sun and rain shelter and a wider range of protection from falling objects. Most hats now have features that allow the attachment of accessories such as face shields, ear muffs and neck shades. In all cases, bright colors are available for better visibility, something especially important when working along streets.



Standard



Full Brim

### Work Gloves

The key to hand protection is a glove that is tough, such as cowhide or synthetic leather, flexible enough to let you work with hand tools, and that fits well. Cuffs are a good idea to protect wrists and keep shirt sleeves tucked in safely. Some cuffs have Velcro closures to keep sleeves tight or to prevent dirt from entering. There are even some glove models made especially for women, complete with fingernail guards.

### Footwear

Professionals usually wear rugged boots, often with steel toes. Lay people are less likely to have such specialized equipment, but boots are important if you are using a chain saw or will be carrying firewood-size chunks of wood. Otherwise, sturdy hiking shoes are recommended or other footwear that provides ankle support and has non-slip soles. No flip-flops, sneakers or other soft shoes!

## Your Health Is Important

Before undertaking tree work, assess your health. Just as someone in a sedentary line of work should not suddenly shovel heavy snow, the same consideration should be given to certain kinds of tree work. Light pruning is rarely a problem, but using a chain saw or lifting limbs or firewood sections is quite a different matter. Know your limits and don't push yourself if you are not in good physical condition.

If you are in good shape, treat tree work like you would in preparing to jog or ski. Loosen up first to prevent muscle strains or worse.

### Prevent Dehydration

Dehydration can be a serious problem in hot weather tree work. Dehydration is basically the loss of more fluids than are being taken into the body. Since all bodily functions depend on water and the electrolytes (minerals) it transports, virtually all processes are affected when things get out of balance – including blood pressure and clear thinking. Here are some ways to counter this insidious problem:

- Eat a healthful, well-balanced breakfast before starting your day.
- Drink plenty of water while you work.
- Snack on fruit and vegetables that are high in water content and include these in your lunch. Especially good for this purpose are cucumbers, celery, lettuce, tomatoes, watermelon and others that obviously have high water content.
- Potassium, one of the important electrolytes, can be restored with cantaloupes, bananas, orange juice and milk.
- AVOID sport drinks, energy drinks and caffeinated beverages such as coffee and soft drinks. These may be enjoyable and provide a short burst of energy, but they lead to electrolyte imbalances and actually increase dehydration by increasing urination.

### Heat Exhaustion – or Worse

Did you know that more people die each year from heat-related problems than from lightning, hurricanes, tornadoes and earthquakes? Lack of water in the body is the common denominator of the heat illnesses that begin with dehydration and can escalate into heat exhaustion and fatal heat stroke. Prevent this by drinking water! Watch for symptoms and if any of the following warning signs are present – stop activity, drink water and cool down.

#### Dehydration

- ✓ Dizziness
- ✓ Dry skin and mouth
- ✓ Thirst
- ✓ Urine dark and less frequent
- ✓ Higher heart rate
- ✓ Fatigue

#### Heat Exhaustion

- ✓ Heavy sweating, cold skin
- ✓ Headache
- ✓ Fainting is possible
- ✓ Nausea
- ✓ Fast breathing
- ✓ Muscle cramps

#### Heat Stroke

- ✓ Hot, dry skin
- ✓ Fever
- ✓ Confusion, agitation
- ✓ Possible loss of consciousness
- ✓ Headache, convulsions
- ✓ Rapid heartbeat

## Know Your Plants and Lurking Creatures

Every locality has its special hazards. Ticks, wasps, poisonous snakes and poisonous plants head the list. A little awareness will go a long way in not running afoul of these. A quick examination of the tree and area around it is a good way to begin work. After the job, check for ticks when you take your shower.



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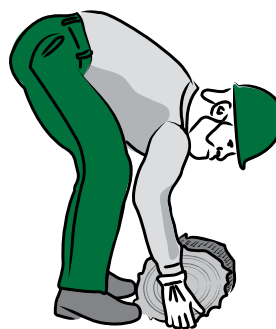


© Scott Camazine

*Poison ivy (left) and poison oak (right) are two good plants to know well – and to avoid.*

### Watch Your Back!

Lifting limbs, cut sections of trunk and containers of wood waste are common activities – and common sources of back pain. Avoid this by remembering people are not cranes. Lift using your knees, not your back. Plant your feet firmly, keep your back straight, and hold the load close to your body as you lift. If you have to strain – get a helper.



*Wrong way*



*Right way*

*Make proper lifting part of your routine.*



# Using a Chain Saw Safely

The chain saw is a professional's primary tool. But with some 40,000 injuries or deaths reported annually, this is also a tool best left to those men and women. Still, when used properly, it can also be helpful and reasonably safe for lay people working on their trees. Most commonly the chain saw will be used for cutting limbs or parts of trees brought down in a storm, thinning clumps of young trees, or cutting firewood. Felling trees or work in the tree crown should definitely be left to the pros.

A sharp saw is a safer saw. It is also one that will be less tiring to use. So, besides reading the operator's manual and following maintenance directions, the first rule of safe saw operation is to sharpen your saw frequently. One way to know if sharpening is overdue is when you see the big, solid chips start looking more like sawdust.

## Special Protective Clothing

In addition to the clothing described on Page 2, some extra gear will make chain saw operation safer:

- **Ear protection.** Chain saw noise can reach 130 decibels or more, enough to cause long-term hearing loss. Ear plugs or ear muffs are the preventative answer.
- **Eye protection** is a must. If safety goggles are used, they should cover corrective lenses (glasses) if worn. A face screen or shield protects a greater area of the face than goggles, but a combination is the very safest.



*A hard hat 'system' that includes a metal mesh face screen, sun visor and ear protection is a good investment when using chain saws. Wearing goggles or safety glasses under the screen is recommended.*

*Courtesy of Ben Meadows Company*

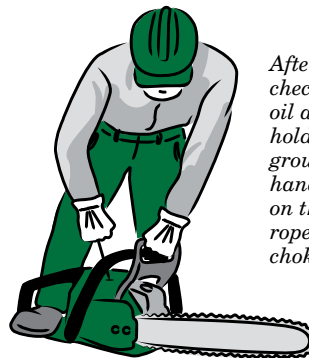
- **Leg protection** is needed to ward off the potentially fatal cut of a saw that kicks back or glances off wood being cut. A variety of leg chaps are available. See page 8 for sources of equipment.
- **Foot protection.** Feet are particularly vulnerable to a wayward chain saw. Tough boots, ideally tall leather boots, are a minimum in protection. Metal toe guards can be added, or slip-on booties made of Kevlar®, the same material used in law enforcement as body armor.

## How to Avoid Common Mistakes

A chain saw is one of the greatest labor-saving devices ever invented. It is also one of the most dangerous. When used properly, however, it is both efficient and safe. When used improperly, it is unforgiving. Complete instruction is not possible on these pages, but here are a few of the most common mistakes made by non-professionals when working on trees – and how to avoid them.

### Starting the Saw

We have all seen a chain saw being started while the operator stands or walks and pulls the starter rope. This dangerous practice is called 'drop starting' and it is prohibited by OSHA rules except under rare circumstances (such as when professionals work in a tree's canopy). Instead, start the saw, as illustrated, on the ground in a cleared area that is as level as possible.



*After selecting a safe area and checking for proper chain tension, oil and fuel, start the saw by: (1) holding the saw firmly against the ground with one hand on the front handle and (2) placing a knee or foot on the rear handle. Give the starter rope a quick but short pull. Make choke adjustments as necessary.*

### Carrying the Saw

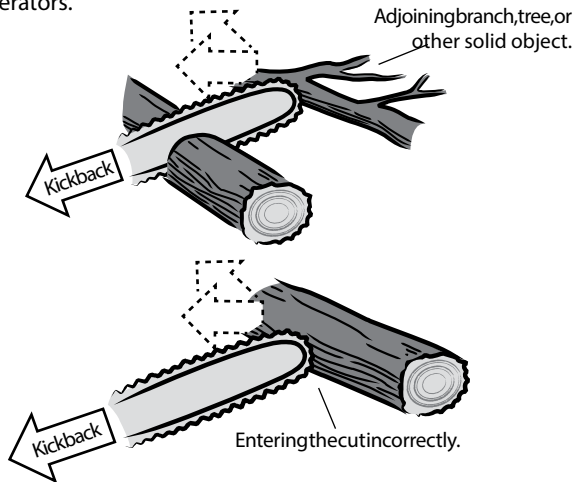
Carrying an idling chain saw is not recommended, so plan ahead to start the saw as close to where you will be working as possible.

### Preventing Kickback

Close to 85 percent of chain saw injuries are caused by 'kickback.' Kickback results primarily from touching the tip of the saw against an object. This rapidly thrusts the saw upwards and/or backwards, potentially striking the operator, especially if he/she loses control of the saw during the kickback.

Kickback can be prevented by always having both hands firmly gripping the saw and making certain only the mid-section of the rotating chain is in contact with what is intended to be cut. It also helps to keep the chain sharp, clear of accumulated sawdust, and to operate at full speed when

entering and exiting a cut. Some saws come equipped with a safety tip that reduces the chances of accidental contact with another object; use of this device is a good idea for inexperienced operators.



Two common causes of kickback are shown here. Other causes include slow running speed, twisting the saw while cutting, damp sawdust accumulating in the chain, and improper chain tension.

### Keeping the Saw Where it Belongs

There are three easy safety rules to remember:

- Keep a firm grip on the saw with *both* hands.
- Use the saw to your right or left, not in front of you. This makes control easier, especially if you experience kickback.
- Never use a chain saw above shoulder height.

## Working on the Tree

There are so many variables involved in using a chain saw on downed trees or for low-branch pruning that discussion of it here is not possible. There are excellent books available (See Page 8), but for safest operation, on-site instruction is necessary. A summary of cautions for non-professionals would include:

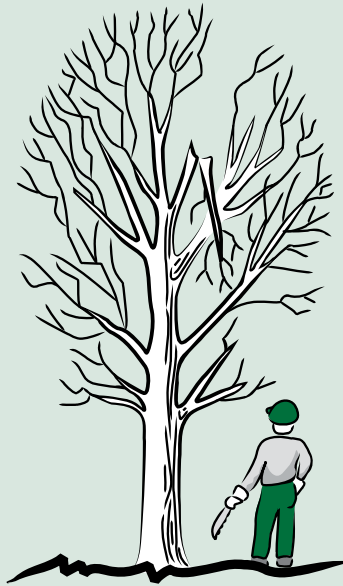
- Stay on the ground when using a chain saw, with both feet firmly planted and the surrounding area clear of brush, limbs and other obstacles.
- On a slope, work on the uphill side of any part of a downed tree that might roll.
- Watch out for spring poles (smaller trees or branches bent over and caught under a larger downed tree or branches. When whatever is holding them down is removed, the tension is released and they spring up violently, potentially causing serious damage.
- Virtually all parts of a tree, standing or downed, are under either tension or compression forces (although

## Check First for “Widow-Makers” and Rot

‘Widow-maker’ is an old lumberjack term for loose branches or attached branches that break loose while a tree is being cut or otherwise worked on below. The name may be a bit outmoded, but the danger is still there by whatever name. Before pruning or working under any large tree, examine the top for broken or loose branches or objects like a tree house or hunter’s stand that might fall. Don’t risk working under the tree until the hazard is removed.

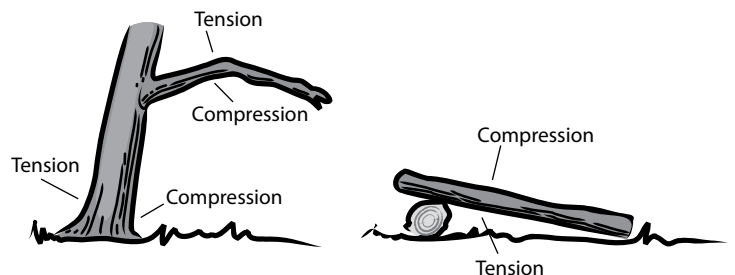
Decay in the tree is another concern. In an

extreme case, working below a decayed area may cause the tree – or part of it – to collapse. If such a condition is suspected, call for a professional.



Regardless of what work you are doing beneath a large tree, check first for anything that might come loose and fall while you are there. On wet or windy days it is best to put away the tools for another time.

usually not as dramatically as in a spring pole). Understanding this principle and anticipating what will happen when a cut is made, is the key to safely making any cut.



Understand where the tension and compression points are before you cut and anticipate the reaction. Generally, one or more smaller cuts into the compression side should be made before a final cut into the tension side. This allows slower and more controlled release of the tension when the last cut is made. Cutting too deeply into the compression side will result in binding (being pinched tight).

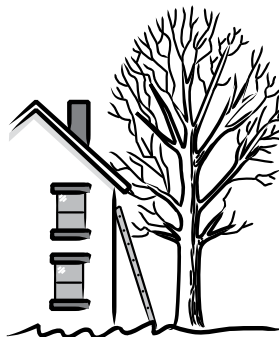
# Ladder Safety

The general rule is – keep your feet on the ground. But while it is easy to espouse this ideal, few tree owners are going to resist the temptation of pruning or doing other tree work a little higher than they can reach from the ground. Given that inevitability, here are some basic tips from the experts on how to use ladders safely. This awareness may keep you from being one of the 164,000 emergency room visitors each year that are treated for ladder-related injuries!



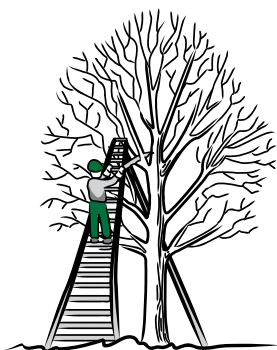
## Standard Step Ladders

Step ladders are made primarily for indoor use on flat surfaces. Outdoors they are dangerous except for use along level sidewalks for low pruning of young trees. When used, make certain the spreader is in good condition and locked before you climb. Never use the top 3 steps.



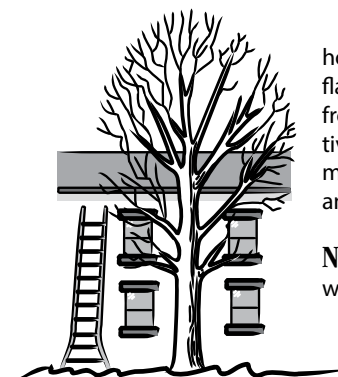
## Straight or Extension Ladders

These kinds of ladders are generally unsuited for tree work. If used, however, stay close to the ground, make sure the bottom rests level and is on solid ground. Having someone steady the ladder is always a good idea, and make sure he/she is wearing a hard hat.



## Tripod Ladders

Sometimes called 'orchard ladders,' these ladders are designed for uneven ground. The spreading bottom helps with stability but the higher you go, the less stable it becomes. When used, the pole side should face into the tree and it is best to only stand on the lower half of the steps. Always make certain the support pole and bottoms of both side rails are on firm ground before you climb.



## Flared Base Ladders

If you are going to use a household ladder, one with a flared base adds a little security from tipping. It is a safer alternative to a straight ladder. Again, make certain the bottom is level and on solid ground.

**Note:** *Never* use a chain saw when working from a ladder.

## Ernesto Learns a Valuable Lesson

While Ernesto Cisneros was a student at the University of Idaho, he decided to expand his education by accepting an internship with the city parks and recreation department. His summer went well until the last week before returning to school. Ernesto was pruning trees in the city park at the time, and he remembers it well. The assignment was similar to what many volunteers do in parks and rights-of-way everywhere. It was to 'raise the crown' of selected trees, i.e. to prune lower limbs that might interfere with vehicles or pedestrians. The tool he was using was the long-handled or lopping shears, certainly a safe enough tool for a student. He was also given an orchard ladder to use as needed.

It was late in the day that August afternoon and Ernesto had only one tree to finish before going home. As fate would have it, an offending limb that had to go was a little higher than the others and a little out of reach from where he was standing on the lower rungs of the ladder. So he did what most of us would do – he climbed higher. As he did, the ladder began to tip and all he can remember is that he either jumped or fell. After that, it was pure pain. When he landed, he struck a surface root that twisted his ankle and broke the tibia in his lower leg.

What did Ernesto learn from this unanticipated and painful lesson? "I needed a pole pruner to reach the higher

limb," he said. "I should have taken the time to go get it rather than go higher on that ladder (with the lopper shears)." A little extra time would have avoided a lot of money spent for treatment and starting the school year on crutches.

Now Ernesto has a little personal rule he follows: "I don't use rungs above my own height on an orchard ladder." We presume he also makes certain it is firmly in place before even climbing that high.

When asked what he might share with others, Ernesto said, "Don't go above the recommended height, even if you can't get the job done. Don't take a risk for one cut – it can be costly."



Courtesy of Ernesto Cisneros

*Ernesto now adheres to his own rule of not going higher on an orchard ladder than his own height – and always using the right tool for the job.*

# Some Other Safety Considerations

## Electrical Hazards

Few of us would go near a rattlesnake. Energized wires should be no different. Each year, thousands of people who work on trees are injured or killed because of contact with electricity. Not even all arborists are qualified to work near power lines. Special training is required, and different degrees of training are needed to work within a given number of feet of certain wires depending on how much electricity they carry. For the lay person that distance should be no closer than 15 feet. Even then, extreme caution is necessary. Here are some precautions to remember:

- There is no such thing as a safe overhead wire. Although wires along a street are arranged on a pole according to voltage (with the highest on top), even the lowest, such as telephone wires or TV cables, carry a charge.
- Secondary wires, those leading from a power pole to your house, are also extremely dangerous.
- The covering or coating on a power line, sometimes called insulation, does not make it safe.
- Wood will conduct electricity! Do not think you are safe around electric wires if you use tools with wooden handles. Contact with an energized wire can be just as deadly.
- Do not attempt to pull vines or branches away from any wire or electrical device.
- Be especially careful that ladders or rented lift trucks do not come in contact with wires.

So, what can you do? For tree work close to any energized wires, call a professional arborist to do the work. For trees in the right-of-way, contact your utility company.

## Before You Dig

Danger can lurk unseen buried beneath the surface as well as in the wires above. Depth of utilities vary, so do not assume they are too deep to worry about. Before tree planting, installing irrigation or doing any other digging, simply call 811. This national number will route your call to an operator who will then determine any affected utility companies in your area. A professional locator will be sent within a few days to mark your lines. This precaution can save lives and the huge expense of repair in case you would damage buried utilities.



**Know what's below.  
Call before you dig.**

## Rakes and Shovels

Injuries can be prevented by carrying and storing common tools properly.



*Carry tools in your hands, not over your shoulder.*

*Lean tools against a building or keep them in a truck. When that is inconvenient, lay them on the ground face down.*

## No Place for Children

Curious children are attracted to work being done on trees. Be aware of their presence and keep them out from under trees where you are working and safely out of reach of chain saws and other tools.



## Safety Training Qualifies for Tree City USA Growth Award Points

Tree City USA communities seeking the next level of recognition – the Tree City USA Growth Award – can earn points by initiating or significantly improving a safety program for city tree workers. This might include daily warm-up exercises, wellness programs, a safety newsletter or similar methods of focusing on safety. New or improved safety training for volunteers would also qualify.



# Communicate About Safety

Professionals have 'tailgate sessions' at frequent intervals, especially when starting on a new job. The idea of a tailgate session is to have a discussion about the possible hazards involved at a particular work site and how to deal with them safely. It is also a chance to talk about past accidents and review old guidelines to keep safety rules fresh in the minds of workers.

A safety session is also a good idea at the beginning of volunteer work projects. In fact, even if you are working alone it is a good idea to do a little self-talk. Here is a checklist that might help:

- What clothing and protective gear is appropriate for this job - and why.
- Do I have the right tool(s) for the job?
- Are my tools sharp and in good condition?
- Is plenty of drinking water available?
- Am I (and others) in good enough condition for the work project?
- How about some stretching or other loosening up exercises?
- Check ladders carefully for loose parts or other defects.
- If ladders are needed, consider ground conditions and how the ladders will be used and by whom.
- Does the job call for working in pairs?
- If there is an accident, is a working radio or cell phone ready, and who will be called?
- If digging is involved, has the area been checked for underground utilities?
- If a chain saw will be used, is the operator thoroughly trained in its use?

## For More Information

Sources of protective equipment, helpful Web sites, books and other sources of information about trees and safety are listed at [arborday.org/bulletins](http://arborday.org/bulletins). Click on Bulletin 51. If you have not visited the Arbor Day Foundation Web site, please explore the other pages. You will find a wealth of information and support materials for all ages and interests. The site is updated frequently, so please bookmark it and visit regularly.

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43. Selling Tree Programs	43. _____
44. What Ails Your Tree?	44. _____
45. Trees For Better Streets	45. _____
46. Data to Advocacy	46. _____
47. How to Bring 'Nature Explore' to Your Community	47. _____
48. Teamwork Strengthens Community Forestry	48. _____
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