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YOUR WOODSTOVE

An Owner's Manual



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YOUR WOODSTOVE: AN OWNER'S MANUAL

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INTRODUCTION

Woodstoves have changed considerably over the years. Remember the old ornate potbelly stove with all the silver trim and intricate detailing? Maybe it was the center of attention in the local feed store, lumberyard, or maybe it was Grandpa and Grandma's pride and joy. Unfortunately, that beautiful looking piece of machinery was a belching, polluting monster. In its time, it was an engineering marvel. But it probably pumped out about 30-60 grams per hour (gph) of particulate emissions (pollution), depending on how it was operated.

Pollution and its detrimental effect on the environment has become a big concern. The U.S. Environmental Protection Agency (EPA) has taken steps to regulate woodburning. They wanted cleaner, more efficient stoves. The wood heat industry met the challenge. They are now producing woodstoves that put out less than 4 to 7.5 grams per hour. Today's woodstoves are much safer because of design, practical sizing, and system approach techniques.

Many stoves now offer a technology that allows an almost complete burn which means a cleaner chimney, cleaner air, and more heat for your money. Not only have woodstoves become energy efficient, attractive appliances, but burning wood can actually be good for the environment.

Wood is a renewable fuel. When a tree grows, it absorbs carbon dioxide from the air and stores it in the wood as carbon. Carbon makes up about half of the weight of wood. When the wood is burned, carbon dioxide is released again to the atmosphere. But the same amount of carbon dioxide would be released if the tree died and decomposed on the forest floor without the heat value of the wood if it had been burned.

So with the harvesting of dead trees and the replanting of new trees, we can have a perpetual source of fuel, provided that we continue to care for our forest and help our environment.

TYPES OF WOODSTOVES

Non-Certified Stoves

These stoves range from fancy antique collectible stoves to stoves that were made before the EPA started to regulate the woodstove industry. Either way, these non-EPA certified stoves do not burn clean. They are the stoves that emit 30 – 60 grams per hour of emissions.

EPA Certified Catalytic Stoves

These stoves have a catalytic unit that actually burns off "unburned" gases as they exit the appliance flue collar. The catalytic combustor is a ceramic honeycomb that is coated with special metals. These metals lower the ignition temperature of the "unburned" flue gases as they pass through. This results in lower emissions and better fuel burn. These stoves currently emit less than 4.1 grams per hour.

Catalytic stoves also contain a bypass damper into the flue. This damper should be opened when the appliance is first started and whenever the appliance is loaded. When the catalyst reaches around 600°, the bypass damper is closed and the gases are forced through the combustor for a clean burn. Most stoves have a catalytic thermometer that shows when to activate the catalyst. If not, a thermometer can be purchased and placed near the catalyst.

EPA Certified Non-Catalytic Stoves

These stoves are designed with advanced combustion technology. They create the conditions necessary to burn off the combustible gases without the use of a catalytic unit.

The firebox is designed to keep temperatures high. It usually has a baffle plate located above the firebox which reflects heat back into the firebox. This allows the stove to burn cleaner and more efficiently.

Emissions for Certified Non-Catalytic Stoves are currently less than 7.5 grams per hour.

PURCHASING A WOODSTOVE

Consider this: Wood prices are stable and are unaffected by foreign dictators, freak accidents (oil spills, refinery explosions, etc.), and national economic trends.

Wood is an abundant renewable resource which can be obtained locally. Burning wood reduces our dependence on foreign oil and helps alleviate our national trade deficit.

When shopping for a stove:

1. Figure the square footage of the area you want to heat and talk with a stove dealer about a stove that will heat that area.
2. Note the space configuration of the area to be heated. Is it fairly open? Or are there several walls and doorways? If the area isn't relatively open, you may need to purchase some fans to help circulate the heated air.
3. If there is an existing chimney, ask a professional chimney sweep if it is appropriately sized for the stove you are considering.
4. If there is no existing chimney, ask your sweep how the installation of a pre-fab chimney will affect the structure of your home? Or will it change the character of your home?
5. Will the heat output be satisfactory for you?
6. Will the firebox accommodate the size of logs you will use?

Be sure to consider these and any other related factors when purchasing your woodstove and you'll be satisfied with your choice.

STYLES OF WOODSTOVES

Freestanding Woodstoves

A freestanding woodstove is a stove that is not in any way incorporated into a fireplace. A freestanding stove stands by itself, exposed on

all sides, and vents into a chimney specifically built for the stove. This chimney may be a brick chimney or a UL Listed factory-built, metal chimney pipe. It is connected to the chimney by a length of stovepipe.

Hearth Stove

A hearth stove is any stove that sits on or in front of the hearth of a fireplace and is vented into the chimney of the fireplace. The main difference between a hearth stove and an insert (described below) is that, in most cases, the insert can be used only in the fireplace. On the other hand, the hearth stove can, in most cases, be installed as a freestanding stove when given its own chimney.

Woodstove Inserts

An insert is simply a stove that is designed to sit inside the firebox of a fireplace. It usually slides into the fireplace and is surrounded by metal plates designed to seal off the space between the fireplace opening and the insert, forcing the draft through the stove.

Most inserts are designed to be installed in a masonry fireplace. Some inserts can be installed in a pre-fabricated, factory-built fireplace, but the insert and the fireplace must be tested and listed together by a recognized testing laboratory for this application.

Pellet Stoves

Pellet stoves are designed to burn pellets made primarily from dried ground wood or other biomass waste that has been compressed into pellets. These pellets are often "recycled" wood or biomass products. Some may also burn corn.

Although pellet stoves tend to cost more, some people like to trade the cost for the convenience of operation.

Pellet appliances have a hopper that holds the pellet fuel and a screw auger that feeds the pellets from the hopper into the combustion chamber. Pellet appliances usually burn fairly

clean because they are fed into the combustion chamber at a controlled rate.

However, most pellet stoves tend to rely on electricity to drive the auger motor and fans, so don't rely on a pellet stove as your only source of heat unless it has a reliable battery backup system.

Pellet appliances require a special type of pipe for venting. If you have a masonry chimney, it should be relined with the correct size of liner required for your pellet appliance.

INSTALLATION OF WOODSTOVES

Location

Here are several factors which may affect the location of your woodstove installation:

1. Features on your woodstove that might affect loading the woodstove and ash removal.
2. Location of the stove so as not to interfere with the central heating thermostat.
3. Possible modifications of the structure of the home or other modifications to accommodate installation.
4. Possible difficulties in maintaining the stove and venting system. Consult your chimney sweep to determine the best location.

The Venting System

In order for a woodstove to function efficiently and safely, the stove must be installed correctly. The best guide to installing your stove is your stove owner's manual. You can also look for help from your local building code authority and your chimney sweep.

The Chimney

The chimney should be either a factory-built, class-A chimney or a properly constructed

masonry chimney. If a factory-built, class-A chimney is used, it should be tested and listed by a recognized testing laboratory such as Underwriter's Laboratories (UL).

If a masonry chimney is used, it should be properly constructed and built to code. Ask your sweep to inspect the chimney before your stove is installed. He will look for old "tin plate" hole covers, damaged or cracked flue tiles, or combustibles in the flue, in addition to other unsafe situations. Many sweeps have a video camera system to get a "close up" look at the inside of your flue.

The Stovepipe

The stovepipe should be in sound condition. Your sweep will clean and inspect it thoroughly for thin spots and deterioration.

There are many different types of stovepipe. There's a heavy, 22-gauge pipe that has welded seams. This is heavy duty and will last for quite some time. There is also a more economical, 24-gauge pipe available. Beware of lighter gauges of pipe. It is not heavy enough to pass code and you'll have to replace it more often.

WOODSTOVE ACCESSORIES

Grates

Some stoves, usually older ones, come with grates or have them built in. A grate is not necessary for a woodstove and in fact, is not recommended unless the stove is designed to use a grate. A 1" - 2" bed of fine ash is sufficient to protect the bricks on the bottom of the stove and enable a nice fire to burn.

Screens

Older stoves often have a screen curtain which should be used if the stove is burned with the doors open. It is not unusual for an open fire to spit sparks as much as five feet or more into the room. Newer stoves generally don't have

screens and are designed to burn with the door closed.

A standing screen or protective gate may be purchased for the purpose of keeping pets and children away from the stove.

Poker

It's hard to do without a well-made, heavy-duty poker. One with a small hook on the end is invaluable for rearranging the logs in the stove.

Tongs

Tongs help you to remain as distant from the fire as possible while adjusting the logs. But be sure and get the heaviest set you can find. A cheaper set will give you more aggravation than they are worth.

Ash Container And Shovel Set

It is necessary to remove excess ashes from the firebox of the stove. A good Ash Container and Shovel Set is a wise investment. Never put the ashes in an open container, cardboard box, or paper bag. The embers can "blow out" while you are carrying it through the house and can cause a fire. Or, ashes could blow all over you and your house.

When you dump your ashes outside, make sure there are no combustibles nearby that could catch fire from the embers.

Woodburner's Gloves

This is one accessory every stove owner should have. Gloves allow you to place a new log into the fire and position it where you want it. You can also reach in quickly and grab the unburned ends of burning logs and shift them around. If the burning log or ember should roll out into the room while you are adjusting the fire, you can grab it immediately and throw it right back in, something that couldn't be attempted barehanded.

When buying gloves, buy either welder's

gloves or gloves specifically made to be used as stove gloves. Don't use an ordinary set of work gloves. They will not offer you much protection, and the cuff on most work gloves is not high enough to protect your forearm.

Log Carrier

This is an item no one should be without. It is a flat piece of leather or canvas with a handle at each end. The logs are placed in the middle and the handles pulled together to form a sling. It is much easier carrying wood this way than stacking it in your arm — and easier on your clothes, too.

Kettles And Steamers

Kettles and Steamers are an attractive way to help humidify your home. Wood heat isn't as dry as heat from a forced air furnace. But, a kettle or steamer with some potpourri or potpourri oil is a pleasant way to add moist, fragrant air on a cold winter day.

Thermometers

Stove thermometers are a necessity to monitor your burning. You can see whether you are burning too low, too hot, or, if you have a catalytic stove, when to engage the catalyst.

There Are Three Types Of Stove Thermometers:

1. Magnetic thermometers which attach magnetically to the surface of the stovepipe are accurate to + or -5% of scale.
2. Probe thermometers precisely measure the inner flue gas temperature in the stovepipe. A hole is drilled into the pipe and the "probe" part of the thermometer is inserted. A magnetic ring around the probe helps to keep it in place.
3. Catalytic thermometers (catalytic stoves usually come with one) allow you to see when to engage the catalytic unit.

Having a thermometer will benefit you

greatly by helping you burn better and allowing you to keep the temperature within safe limits.

Stove Boards

Stove boards are often needed for a safe installation. There are many kinds of stove boards on the market.

Just make sure the stove board you purchase has been tested by a recognized testing lab to UL standards and matches your room decor. You would literally have to take apart the installation and move the stove to change a stove board if you decide you don't like it.

If you use a stove board for a wall protector, make sure it is intended for that purpose. If you are unsure, consult your chimney sweep.

Firestarters

Always use a commercial firestarter. Never use kerosene, gasoline, or any other kind of fuel to start a fire. A backflash can occur, severely injuring you.

CHIMNEY CAPS

Five Good Reasons Your Chimney Needs A Cap

A Cap Keeps Out The Rain

More damage is inflicted on chimneys as a result of not having a cap than from any other source, including chimney fires. While only some chimneys will suffer the ravages of a chimney fire, all chimneys will suffer damage from rain unless they are properly sheltered.

Additionally:

Rain soaks into the mortar joints in the flue. When it freezes, it expands, eroding and weakening the mortar joints and thus, the whole chimney. Such a chimney eventually becomes unsafe.

Rain can cause a musty, distasteful odor in

the chimney. This will happen in warm weather, especially if the chimney is dirty or has bird droppings on the shelf.

Rain can cause your woodstove to rust rapidly. Heat greatly increases the rate of oxidation (rusting). The continued use of the stove means the creosote residue, mixed with the water and heat, will cause this process to take place at a greatly accelerated rate. And rain can actually crack a hot stove top. This can mean costly repairs.

Rain can also cause the stovepipe to rust out. This can mean more expense in having the stovepipe replaced more often.

Rain can also cause rivers of brown creosote to run down the inside of the chimney, resulting in possible leaks around the thimble or smelly pools of creosote left in the clean-out area.

A Cap Keeps Out Birds, Squirrels, And Other Varmints

Birds are fun to look at, but they do have a few bad qualities when perched on your chimney.

They chirp and flutter constantly and may also become trapped in your stove, causing you to disconnect the stovepipe to get them out. Bird droppings leave a breeding ground for mites, and can also cause a rare, but serious, lung disease.

A squirrel can wreck a house faster than a dozen two-year olds. Once they get inside the chimney, the only way out is back up the chimney or through your house. Wait till you open your stove door some morning and see a soot-covered, panicky squirrel in your living room or den. You will quickly lose interest in them as furry, cuddly creatures, and chances are your homeowner's insurance won't cover the damages.

Raccoons also seem like cute, cuddly creatures. Some morning you may find a mother raccoon and a whole nest full of babies in your chimney. Raccoons are fierce creatures when

they feel cornered, or when they have a nest of young to protect. They also carry diseases like rabies and roundworm. If raccoons have to be removed, it may cost a hefty sum, and they will probably return again and again. This can be avoided by having a cap.

A Cap Reduces The Risk Of Roof Fires

Roof fires from hot embers, etc. are very common. Installing a chimney cap will help prevent them, as its spark arrestor will help trap hot embers.

A Cap Inhibits Downdrafting

A fireplace that smokes can result from several factors. One of these is downdrafting. Downdrafting occurs when wind blows the smoke back down the flue into the room or into your face when you are loading the stove. A cap can help prevent this. There are even special caps and fans to promote draft if this is a common occurrence.

A Cap Keeps Out Leaves

Leaves can choke a flue, causing smoke to spill back into the room. And, they ignite easily, potentially resulting in a chimney fire.

Choosing A Cap

The best material for a cap is stainless steel. It won't rust or corrode and will withstand the intense heat of a chimney fire without melting. It's well worth the extra expense.

Caps manufactured of stainless steel can usually be purchased only from chimney professionals. Most hardware store variety caps are manufactured of either galvanized steel or aluminum.

Galvanized steel is "okay" for seldom used fireplaces; however, they will rust and corrode with day-in, day-out use. If you live along the coast, the salt air will also corrode a galvanized cap quite rapidly, leaving ugly rust stains on the

chimney and even on your roof. These can be very hard to remove. Aluminum is somewhat resistant to corrosion, but will melt in the extreme temperatures of a chimney fire.

Also available are copper chimney caps. They will not keep their copper finish, though. Eventually they will tarnish. If you have copper flashing or ornamentation on your house that has already tarnished, this may be the cap for you.

Your chimney sweep will properly install the type and size of cap that best suits your needs.

WOODSTOVE MAINTENANCE

Each year it is important to have your woodstove and chimney thoroughly inspected. Call your sweep and line up a chimney cleaning and inspection. Most stoves have several things in common that must be taken care of. Here are some of the things your sweep can check for:

Clean The Stove Thoroughly

It's a messy job, but your sweep has the equipment to do this for you.

Worn Gasketing

Your sweep can replace worn-out gasketing. Gaskets help make the door airtight, enhancing the performance of your woodstove. If your stove has a worn-out gasket or one that has come loose, the stove can get more combustion air than it was designed to handle — your stove won't burn as clean and you'll use more fuel.

Door Handle Function

Is the handle holding the door securely shut? It may need some adjustment.

Draft Controls

Your sweep can make sure the draft controls are operating properly. Creosote will clog the controls making them difficult to move or to get a good seal.

The Damper

Your sweep will make sure it is functioning properly.

Cracks

If you have a cast-iron stove, check for cracks in and between the castings. If you find some, your sweep can probably repair them.

Thin Spots And Rust

If you have a steel stove, you can check for thin spots by pressing firmly with the palm of your hand on any area that appears burned. If it is thinning, it will flex. If you discover a thin spot, it is time to start looking for a new stove.

If you find rust, your sweep may be able to clean the rust off and repaint your stove. Otherwise, you may as well look for a new stove.

Catalytic Replacement

When your chimney sweep cleans your chimney, he can remove and clean the catalytic unit. This should be done every year to prevent it from plugging and allow it to function efficiently.

Cleaning The Glass Doors

Newer stoves have an "air wash system" that keeps the glass doors cleaner longer. For older stoves, or when you need to clean your glass doors, there are many excellent glass door cleaners on the market that will clean smoke stains and creosote from the glass. Just make sure the glass is cool before you attempt to clean it or it may break.

Repainting Your Woodstove

If your stove has had a lot of use, or if you just want a new look, your chimney sweep can repaint it. Stove paints come in a wide variety of colors so you can customize it to match your decor.

Polishing Your Woodstove

Stove polish is available to maintain the appearance of your stove. Most stove polishes are designed to be rubbed on the stove and then wiped off, like waxing a car. Some polishes stain your hand, some wash right off. If in doubt, wear rubber gloves.

Special Concern For Woodstove Inserts

If you have a woodstove insert, your sweep will check the insulation on the surrounds (these are the "plates" that seal the area between the outside of the insert and the face of the fireplace). If this insulation is worn, your sweep can replace it.

GETTING THE FIRE STARTED

Open the damper on your stove. If it has a catalytic unit, make sure it is disengaged. If the catalytic unit is not disengaged, it can cause plugging of the unit. This sounds like the appliance repairman telling his customer to plug in the appliance, but it's forgotten more times than most people care to admit.

Check The Draft

Draft is defined as the buoyancy of hot air and is the result of a pressure difference between the inside venting system and the outside of the home. If the flow in the chimney is reversed or stagnant, you may find you have a room full of smoke before the draft begins to move in the right direction. You can check this by either wetting your finger and holding it in the stove (cool side tells you which direction the air is moving), or lighting a match and holding it in your woodstove. If the match flame pulls strongly towards the opening of the stove, you may have a problem getting draft established.

If you have a problem establishing a draft, check to see that the air inlet/damper controls on the stove are open and that the catalytic unit

is disengaged. If you still have a problem getting it going, try opening a nearby window. Also check to see that all competing vents (other fireplaces, bathroom and kitchen fans, etc.) are off. Keep in mind that your chimney sweep can help you solve this problem.

Prepare The Ashes

If your stove is designed with a firebrick floor, you should always have a 1" to 2" bed of ashes under your fire. This helps to protect the firebrick that the wood sets on and helps to establish a fire.

Lay The Fire

You need three things to lay a fire:

Tinder. Most people use wadded up newspaper. It's better to roll the paper into a cone and place it pointing to the back of the fireplace. This produces a hotter, quicker fire, with less smoke. Other forms of tinder would be hemlock, birch bark, cedar twigs, dry pine needles, or wood shavings.

Commercial firestarters may be substituted for, or used with, tinder. They make starting a fire easier and some burn for as long as 10 to 15 minutes.

Kindling. Consists of twigs, branches, and small splits of wood anywhere from 1/4" to 1" in thickness. This is the most important ingredient to building a good fire and usually the most overlooked.

Fuel. These instructions will be limited to laying a fire when wood is used as the fuel. A chart on types of wood follows on page 39 with information on the best "coaling" types.

The use of coal or artificial logs in a woodstove is not recommended unless the stove manufacturer suggests it.

There are many ways to lay a fire. The trick to successfully laying any fire is an adequate amount of kindling. Three logs are the perfect

amount for starting a fire. Any less and you will have difficulty maintaining a blaze; any more is simply too much and can be hazardous.

"Z" Method

Place tinder on ashes. Remember to have about an inch of ashes in the stove. Cover the tinder with a layer of kindling. Now, depending on the shape of your stove, place a large log either at the rear of the stove or on the side. Parallel to that, at the front or opposite side, place another log about half the size of the first. Fill the space between these two with additional kindling. Finally, place a split log diagonally across the top of the first two forming a "Z" between the three logs.

Check the draft before lighting this fire. If the flow in the chimney is reversed, or stagnant, you may find you have a room full of smoke before the draft begins to move in the right direction.

To start the draft, roll a small cone of newspaper and light the big end holding it so the flames reach just below the damper until it's obvious the draft is moving up the chimney. If you find you are constantly having to do this, you might consider using a hair dryer to establish the draft. The advantage to this is that it creates a high amount of heat and is totally smokeless. You can keep it going as long as you need. Just be careful not to blow ashes into the room. When you're sure you have established a draft, you can light the fire.

If you still have a problem getting the fire going, try opening a window nearby and check to see that all competing vents (other fireplaces, bathroom and kitchen fans, etc.) are off.

The Upside-Down Fire

This method of starting a fire helps to ensure quicker start-ups and more efficient burns. Instead of putting the tinder and kindling on the bottom, stack the largest logs on the bottom, leaving a few inches in between. Then use layers of smaller, softer wood in crisscross fashion as

you build it higher. Lastly, add the tinder or firestarters on the top and light it. The tinder or firestarters will heat up the firebox. This warms up the stove and will establish draft quickly.

Then, as the tinder and the kindling burn, embers fall down on the kindling and logs below and help to ignite them. As the bottom logs heat up and start to release their volatile gases, there is enough heat and flame above to ignite the gases. An upside-down fire also tends to burn longer than a conventional fire. And due to the efficiency of it, there's less creosote buildup.

Keeping It Going

If your stove has a screen and is designed to burn with the doors open, keep the screen on, and the doors wide open, for a good half hour. When you feel the fire is going well and you are developing a bed of coals, close the door and set your draft controls.

If your stove is designed to burn with the doors closed, keep the draft control fully open until the draft is well established, the wood is burning strongly, and there's a bed of coals.

You will have to experiment with the stove for several weeks before you find a setting that works for you. You want to keep a moderately hot fire in the stove at all times. Don't try for marathon burn periods. It is much better to add smaller loads more often than to cram it full of wood trying to get an all-day burn.

When reloading your stove, be sure to burn it hot, with the draft controls wide open, for 20 to 40 minutes.

Woodstove Comfort

If your stove seems to have suddenly stopped producing heat, or you just purchased a new stove and do not feel you are getting any appreciable heat output, the wood you are using may not be seasoned enough.

If the wood you are using is well seasoned and you're not getting much heat, consult your chimney sweep.

Moving The Heat

Warm air will normally seek the cold air in a house, but it sometimes needs assistance. One simple thing you can do is to place a floor fan near the room's entrance blowing *into* the room.

Warm air rises and travels along the ceiling to the opening, moving through the opening on the high side. To displace the warm air leaving the room, cool air flows in at the bottom of the entrance. Placing a fan blowing out bucks the natural flow of air, stopping the heat from flowing out and the cooler air from moving in. Thus the heat is trapped in the room and the cooler air from the rest of the house does not get heated. Blowing air into the room at floor level facilitates the flow of heated air to the rest of the house and cooler air to the stove.

Using a paddle-type ceiling fan in the same room as the stove will not necessarily help the air flow throughout the house, but it will make the room more comfortable.

Turning on the blower of your forced air system will normally do little to help. It may cool off the room the stove is in, but it will not add much heat to the rest of the house. The heated air going into the duct work will exit the system considerably cooler.

If your home is two or more stories, placing a floor register in the ceiling over the stove may move some heat upstairs, but it will probably rob the rest of the downstairs of heat. The stack effect (the tendency for heated air to rise to the highest points of the home) will carry more than a sufficient amount of heat to the upstairs while still heating the downstairs living area.

If the rest of your home is warm enough, but the room your stove is in is still too warm, you may have bought a stove too large for your home. A ceiling fan will make the room a little more comfortable. You may also try building smaller fires and loading the stove more often. Don't choke the stove down to reduce its heat output. The rule is: Cool the house, not the stove. If needed, open a window.

Humidity

As with any heating system, there is the tendency for the heat to dry out the air. Dry air is unhealthy for humans and household items. Lack of humidity increases dust in the air and increases the rate of deterioration of household items.

The most effective way to remedy the situation is to purchase a humidifier. You can also place a pan or kettle of water on top of the stove, preferably one made of stainless steel or enamel as neither will rust. If you use a pan, make sure it doesn't have any wooden handles that could catch fire.

BUYING WOOD

Units Of Measurement

Cord

This is a unit of measure 8' long by 4' high by 4' deep, or 128 cubic feet. Because of the irregular shape of logs, the average cord contains only about 80 cubic feet. The way the wood is stacked largely determines how much wood you actually receive. There is an old New England rule for stacking that pretty well sums it up: "If you're selling, stack it so a cat can run through. If you're buying, stack it so it can't."

Face Cord/Run/Rick

This is a unit 8' long by 4' high and any depth. It's important to specify "full cord" if that is what you intend to buy. If you don't, you may end up with an abbreviated version.

Truckload

This is obviously a pretty vague unit of measurement. What size of truck? The average cord of seasoned hardwood weighs about two tons. If it is delivered in a half-ton pickup, you're not getting a full cord.

By The Pound

A pound of wood, regardless of its type, is a pound of wood. The only difference in types of wood is its density. An oak log weighs considerably more than the same size pine log. This means there is more fuel packed into the oak log, and it is worth more. When buying by any other unit of measurement, you may pay more per pound for softwoods. If hardwood is available in your area, it's a good idea to specify hardwood when ordering.

When Ordering

Be Specific, Ask Questions:

Is it hardwood or softwood? 100% hardwood? What type of wood? How much per cord? A full cord? Is it seasoned? How long? To what lengths is it cut? Is it split?

Specify full cord if that's how much you want. If you have a choice between hardwood or softwood, specify hardwood because you will get more heat value for your money. If you don't have a choice, you can always go somewhere else. Unless the price difference between the two is greater than 25%, pay the extra for the hardwood.

Specify dry, seasoned wood if available. The moisture content of green wood is typically 50% or more. Seasoned wood has a 20% to 25% moisture content. Green wood requires from six months to two years to season.

So if the wood you purchase is green, you should pay considerably less for it. Tell them you want it stacked, but be aware that many will charge you extra to do so. If you want it split, specify.

When It Arrives

It is important to be there when the wood arrives and be firm about getting what you pay for. Check the wood as it's unloaded. Then

measure it to make sure that what's delivered is what you've paid for. Check for dryness by looking for check marks. These are cracks that radiate outward from where the center of the whole log would be. The larger the check marks the better. Green wood may appear dry, but without pronounced check marks, you can be assured it is not.

Another method of testing is to bang two pieces together. Dry wood will give a sharp ringing sound. Green wood will give a dull thud. If you ordered hardwood, don't accept pine, cedar, or other softwoods. If you do, you are paying filet mignon prices for hamburger.

Storing Your Wood

Wood should be split as soon as possible. Unsplit wood will take considerably longer to season. Wood should be stored off the ground. If possible, store it in the sun. Wood stored in shade takes longer to season and can decay. Cover the pile with plastic on rainy days. Occasional light rains won't hurt, but continuous or heavy rains can slow down the seasoning process considerably. Don't store wood in the house or stacked up against the house or garage. Cut wood attracts all kinds of varmints and undesirable critters.

WHAT'S IT LIKE TO HAVE A CHIMNEY FIRE?

It's no picnic. Chances are it will only scare the daylights out of you. However, it can damage your house considerably if allowed to get out of control.

A chimney fire burns so hot (sometimes in excess of 2000°) that it can crack the flue tiles in a masonry chimney. In a prefabricated chimney, a chimney fire can cause the joints to separate or the pipe to warp. In either situation, the fire can then spread to other parts of the house. The

brickwork itself can radiate enough heat to ignite paneling or surrounding woodwork.

The fire can melt mortar from the masonry chimney joints and send it flying into the air like a roman candle with red hot pieces falling on your roof and your neighbors' roofs. Add to that the embarrassment of having three fire trucks parked in front of your house, and you begin to get the picture.

After a chimney fire, it's very important to have a chimney sweep clean and inspect the chimney. There could be a buildup of creosote that is blocking the flue. There could also be cracked or damaged flue tiles (in a masonry chimney), or warped or separated pipe (in a prefab chimney). This will create a dangerous, life-threatening condition.

If you have a second chimney fire in a damaged chimney, the cracks in the chimney can open up and creosote and flames can penetrate through the tiles or pipe. Add this to a chimney that has cracks, and you can end up with flames and creosote coming into contact with surrounding combustibles including roof joists, paneling, etc.

What To Do In Case Of A Chimney Fire

1. Call the fire department. Hopefully the fire will be out before they get there, but you will want them to inspect the structure and make sure there is no latent damage or hazard.
2. Make sure everyone is out of the house and safely away from popping embers that may shoot out of the chimney.
3. If you have a chimney fire, use a chemical flare-type fire extinguisher. If you don't have an extinguisher, crack the door to the appliance just enough to insert the nozzle of a dry chemical fire extinguisher. Discharge the entire contents of the extinguisher into the appliance and shut the door. If you have neither, go to the next step. After the excitement is over, buy an extinguisher.

4. Close off the air inlets in your stove. This will help to deprive the fire of oxygen.
5. Go outside and hose down the roof surrounding the chimney. Do not wet the chimney itself or try to put water down the flue. Not only will it make a mess of your house where the water comes out the other end, but it will very likely damage the tiles that line the chimney flue.

Also, closely monitor all combustible surfaces close to the chimney. These surfaces may ignite if they get hot enough.

6. After the firemen leave, call a chimney sweep to get your chimney inspected for damages and document the findings for insurance purposes before cleaning. Chances are the firemen will condemn the chimney until you have it inspected. A dangerous myth that a chimney fire will leave the chimney clean is *not* true. The truth is, the fire will compound the problem by causing the creosote present to expand and honeycomb. This could cause a blockage, and also prepare a better surface for more creosote to collect. Then it will be more likely to ignite again with much less provocation. If the chimney is inspected by a chimney sweep, he can look for cracked flue tiles or other damage and recommend a solution for repair if necessary.
7. It's also important to document the fire and talk to your insurance agent. Your insurance company may help cover the cost of repairing the chimney, but you have to prove there was a fire and that the chimney was damaged. Be sure to get a report from the fire department, your chimney sweep, and get the names of your neighbors or other people who may have been at the scene. Be sure to contact your insurance agent right away.

What Is Creosote?

Nothing ever burns completely. Wood smoke is a combination of unburned gases and a fog of unburned, tar-like liquids. When these gases come in contact with a cool surface, they will condense and form a nasty dark brown or black substance which has an unpleasant acrid odor. This is creosote.

Creosote starts as a liquid which results from the condensation of flue gases. Creosote comes in a range of forms: from sooty, tacky deposits resembling tar, to hard, shiny deposits. Creosote collects inside the flue passage, in off-sets, and in termination parts of your chimney. These deposits reduce the flow of gases through the chimney system which may result in a weak draft or smoke filtering into the room.

Creosote is highly flammable. When large quantities are allowed to build up, the result could be a chimney fire. No matter what kind of chimney you have, such overheating is dangerous to the chimney structure and the surrounding building. Veteran woodburners know the importance of keeping their chimneys clean. However, many newcomers to heating with wood may be unaware of the potential harm and hazard of creosote buildup.

There Are Three Factors That Influence Creosote Deposits:

Smoke Density:

High smoke density increases the rate of creosote formation. Smoke density can be reduced by increasing the flow of air, and by using smaller pieces of wood or adding less wood more often. Hotter fires will also lessen the smoke density by causing more complete combustion of the wood and gases.

Temperature of the Condensing Surface:

The cooler the surface, the more creosote will condense. One can relate this to water vapor condensing on the outside of a glass of cold water on a humid day, except the reverse — con-

densation occurs on the *inside* of a chimney, especially when the outside cold air makes the inner surface of the chimney relatively cool. Keeping stack temperatures high will reduce this problem.

Residence Time:

The longer the smoke stays in your chimney, the more likely it is to condense on the surface.

The Problem With Glazed Creosote

Glaze is a type of creosote deposit that appears in several forms and can be very difficult to remove. It may only appear as a few shiny patches in the flue or smoke chamber of a fireplace. It may be a thin, even coating up and down your flue and smoke chamber, giving the appearance of being freshly painted with black enamel or high gloss paint. It may appear as a sludgy, tar-like deposit, sometimes even sticky and runny in places.

Whatever the form, it is a problem, and in the event of heavy deposits, a real hazard. On the lighter side, it simply causes corrosion to the system and odor problems. On a more serious note, it creates a fire hazard. A concentrated fuel, it can create the most severe chimney fire.

What Causes Glazed Creosote?

Until the recent advent of modern airtight woodstoves, glaze was hardly seen, particularly in fireplace inserts. It is caused by two things: (1) incomplete combustion in the combustion chamber, and (2) inadequate flue temperature.

Incomplete Combustion

Smoke, simply put, is fuel that didn't burn up in the combustion chamber. Creosote, in whatever form, is smoke that didn't leave the chimney.

In order for the wood to burn completely, two things must be present: (1) temperatures in excess of 1100° F, and (2) an abundance of oxygen.

INADEQUATE FLUE TEMPERATURE

Remember the cold glass on a hot day analogy? A good portion of the smoke leaving your woodstove consists of water. Regardless of the dryness of the wood used, water vapor is always present in smoke.

During the burning process, hydrogen joins hands with oxygen and forms — you guessed it — water. The smoke leaving the stove will come in contact with the surfaces of the smoke chamber and flue. How much of it condenses depends on how hot the smoke is, how cool the surface it's touching in relation to the smoke temperature is, and how long the smoke stays in contact with the surface.

The cooler the smoke, the closer it is to its condensation point. The cooler the surface it touches, the quicker it is cooled to its condensation point. The longer it is in contact with the cooler surface, the more it is cooled.

Hot smoke coming in contact with a hot surface leaves a dry, sooty deposit which is easily removed. Cool smoke, coming in contact with a cooler surface, leaves a runny, tar-like deposit which is very difficult to remove.

Cool smoke comes from low-burning temperatures. A cool flue can be the result of several things:

1. Oversize flue tiles. Fireplace chimneys were not designed to vent woodstoves. In almost all fireplaces the flue is grossly oversized for the stove it services. Most stoves require a much smaller flue.
2. Exterior chimneys, for obvious reasons, will stay much cooler than interior chimneys. The colder the outside air, the more difficulty in maintaining adequate flue temperature.
3. Cool air leaking into the flue from outside the stove can cool the flue and the smoke in it. In the case of inserts, surrounds that are not properly installed can allow leakage. In

freestanding stoves vented into the fireplace, an inadequate seal around the closure plate can cause leakage.

4. Last, but certainly not least, low operating temperatures in the stove do not make for a warm flue.

HOW TO MINIMIZE CREOSOTE

Burn Only Seasoned Hardwoods

Dry hardwoods reduce the generation of creosote because of their high temperatures and low smoke density, but a large degree of creosote can still build up.

Don't Allow The Fire To Smolder Overnight

When you are finished with the fire, separate the unburned pieces from the coals. If possible, stand unburned logs on end at the back of the stove.

Don't Burn Trash In Your Stove

Burning trash in your stove can dirty your chimney fast and send large embers up the flue that could start a fire on the roof or surrounding combustibles. This can create a dangerous situation. If there is a creosote buildup, a large ember could set the creosote on fire. Burning trash could also clog up your catalytic unit on the stove and void your stove warranty.

Check For Buildup Periodically

An inspection should be done at least once a year by a chimney sweep to make sure everything is in good working condition. In addition to this, you need to conduct periodic inspections to check for creosote buildup.

How Often Should A Chimney Be Cleaned?

A chimney should be inspected at least once a year and cleaned if necessary. But more frequent cleaning may be needed based upon:

1. How often you use your woodstove.
2. How your woodstove is designed.
3. How you manage your fire.
4. What type of wood you burn.
5. How well seasoned the wood is.
6. How often you let the fire smolder itself out.
7. What the weather is like.

HAVING YOUR CHIMNEY CLEANED

How To Choose A Chimney Sweep

Would it surprise you to know that all chimney sweeps are not alike? Here are a few things to check on while looking for a sweep.

Does He Have The Proper Cleaning Equipment?

One of the most important cleaning tools a chimney sweep should own is a good vacuum. A good vac will help control the soot while the chimney is being cleaned. This means you shouldn't have any soot floating around in the house. Vacuums used for sweeping have special filters to trap the creosote dust particles.

The chimney sweep will use a steel brush or a polypropylene brush attached to chimney rods. These rods may be either fiberglass or flexible polypropylene.

When your chimney sweep cleans your chimney and fireplace, he should also do a thorough inspection. In the past, sweeps used flashlights and mirrors to try to detect problems. But this method didn't catch all of the problems.

Many chimney sweeps now own a video inspection system that can be used to see the inside of your chimney. The chimney sweep scans the flue with a special closed-circuit camera. There is a cable that connects the camera to a monitor so he can document any normally unseen hazards. This also gives you the opportunity to thoroughly see the inside of your chimney. Many homes have been saved through the use of this special equipment.

Your chimney sweep usually has the equipment on hand to test for leaks. This can be done with a smoke candle or smoke test pellets. These are similar to a smoke bomb, but are set off in the chimney under controlled circumstances.

Many chimney sweeps clean from the top of the chimney. It can also be done from below, but he will probably still go to the top to make an inspection of the top of the chimney. He may also want to look at the chimney in the attic area or another accessible area to look for hidden dangers. He will make a thorough inspection of the fireplace area and smoke chamber.

Your chimney sweep will clean the stovepipe and inspect it thoroughly and also clean the chimney cap if needed.

Is He Insured?

Most chimney sweeps carry insurance. Ask if he is insured before making an appointment.

What Is His Training?

Has he had any formal training in chimney sweeping? If so, where? Did he go to the Chimney Safety Institute of America training school, or work with another sweep? Modern sweep methods have been in existence since around 1978. Most of today's sweeps are chimney professionals whose overall business is based on making your chimney safer. Today's chimney sweep is technically advanced. Many are certified through the Chimney Safety Institute of America and abide by stringent safety and building codes. Beware of other tradesmen

who claim to have worked around chimneys for many years. If their price seems overly attractive, then it's probably too good to be true.

What Are His Credentials?

Does he belong to a national or state organization? Has he been certified by the Chimney Safety Institute Of America? Or has he been certified by his state organization or HEARTH Training Programs? Does he regularly attend seminars to keep up to date? A "no" to these questions doesn't necessarily indicate he won't do a good job. But because technology is always changing, a chimney sweep has to keep up on changes by attending seminars and getting recertified every few years. If he doesn't do these things, it indicates he's not very serious about his profession.

What Are His Rates?

If he is charging a whole lot less than others in the area (like 30% to 50% less), be careful. He might be taking a shortcut somewhere, or he may plan to make up for it in some other way. On the other hand, if he is charging more than the norm, he may be worth it. It's worth the extra dollars to get a professional opinion from a professional chimney sweep.

Does He Have A Minimum Charge?

Chimney sweeps are honest folks who will tell you if your chimney does *not* need cleaning. However, he has taken the time and given you an inspection, and that's worth something. Most will charge an inspection fee even if your chimney doesn't need to be cleaned.

Does He Provide You With A Written Condition Report?

Most chimney sweeps will leave the customer with a written condition report, informing the customer of the condition of his chimney and any defects he may have discovered while

working in the chimney. In this report, the chimney sweep should note any conditions he feels are not safe and need improvement. If you have a woodstove, he should advise you of the safety of the installation or any deficiencies he finds.

CHEMICAL CHIMNEY CLEANERS

Never use a chemical chimney cleaner you are unsure about. Your chimney sweep will advise you of a good product to use. Some chemical cleaners and home remedies can greatly damage your chimney. These cleaners are often very corrosive and will cause deterioration to your chimney and stove. They may also emit unhealthy fumes.

There are many chemical cleaners out on the market that are "tried and true." They are chemicals manufactured by reputable companies that often specialize in products specifically for chimneys. These chemicals have been around for some time and are effective when used properly. Your chimney sweep can tell you which product is right for you. Many of these chemicals can also be used as maintenance products to help prevent excessive creosote buildup. This does not take the place of cleaning your chimney, but should make removal of creosote easier in the future.

TROUBLESHOOTING GUIDE

Smoke Problems

Here are some of the most common causes of smoke problems. Simply find the symptom that most fits your situation. It is possible, and even probable, your woodstove is suffering from more than one problem. Many times, where a single problem is not sufficient to cause backpuffing, several combined problems will. If this is the

case, each problem will have to be tracked down and cured separately. Should none of these cures work, do not let the backpuffing continue! Contact a chimney sweep for further assistance in diagnosing the problem and prescribing the cure.

Problem: Constant Smoking

Solution A:

If your woodstove is plagued by constant smoking, and no matter what you do seems to help, open a window as close to the woodstove as possible. If the smoking lessens or stops when the window is opened, the problem may be inadequate air supply or a pressure problem in the house. This may mean you'll need the window open when your stove is in use.

Solution B:

Extinguish the fire and look for interior obstructions. A seldom used chimney may be clogged by a squirrel or bird nest. Soot and creosote can plug or restrict the airflow. If the chimney is older, the problem may be a structural failure. Fallen bricks, mortar, or metal may be obstructing the flue.

All obstructions must be removed. A blocked chimney is a fire hazard and should never be used until completely cleaned, inspected and repaired (if necessary) by your chimney sweep.

Solution C:

If you have a woodstove and your chimney cap has a screen, there is a chance the screen is clogged with creosote. If this is the problem, consult your chimney sweep. It may mean there is a problem with your installation or that you need to change your woodburning habits.

Problem: Erratic Smoking

Solution A:

What is the weather like outside? If the outside temperature is fairly close to the inside temperature and there is a high pressure cell in the area, you probably don't have enough air

pressure in the house to maintain a draft. The solution is to wait for the weather to change or address the pressure problems in your home.

Solution B:

Check for the existence of competing vents. Kitchen and bathroom fans, furnace cold air returns, or chimneys for other stoves or fireplaces may overpower the chimney by drawing the air *they need* in through the chimney when you're wanting the smoke to go out.

If the house is two or more stories, hot air rising and escaping from the top story (due to an open window, poor insulation, major leaks, etc.) can reduce the air pressure of the ground floor and pull air in from the outside, even back down the chimney.

Consult your chimney sweep for possible solutions.

Problem: Erratic Smoking With Hard-To-Light Fires

Solution A:

Check your wood. Excess moisture in the wood can be one problem. Dense woods which are hard to light can cause an initially cool fire and result in poor draft and excessive smoke.

Solution B:

Check your damper opening or draft setting. An opening that is either too large or too small can result in incomplete combustion. Experiment to find the most effective settings.

While experimenting, don't make drastic changes. The key is consistency and moderation in making your adjustments. Make small adjustments spaced well apart. This gives the fire time to adapt to the new setting before you make any further adjustments.

Solution C:

Analyze your start-up procedure. Pay special attention to loading patterns and the kindling used.

Problem: Smoking Occurs In Light Breezes

Solution:

This may mean your chimney flue is too large for your woodstove. Or, your chimney may not be high enough. Consult your chimney sweep for help.

Problem: Smoking Occurs In Heavy Winds

Solution:

Check for obstructions that might form a downdraft. Roof lines, trees, hills, or nearby structures can all cause downdraft problems. When the wind blows over and down around them, the downdraft simply blows down the flue, sending the smoke into the house. A chimney cap will reduce the effect of these near vertical blasts of wind. Your chimney sweep can supply a cap designed to cure the smoking problem.

Problem: Smoking Occurs When Stove Door Is Opened

Solution:

This is most often cured by simply opening the doors very slowly, allowing the airflow to adjust in the firebox. Opening the draft control several minutes prior to opening the doors will raise the temperature and eliminate a lot of the smoke, reducing chances of backpuffing when the door is opened.

Problem: Smoking Occurs When Household Doors Are Opened

Solution:

A household door opened or closed too rapidly can result in a change in your home's air pressure, causing the draft to briefly stop or even reverse. This is more often a problem with fireplaces than with woodstoves. A temporary solution would be to use hydraulic door closers.

Another problem can result from inward

opening doors fanning the air, resulting in momentary backpuffing. A high-backed chair or screen placed between the door and wood burner may cure this problem. Check with your chimney sweep for a permanent solution.

Chimney Odors

That sour, sickly odor you have is the odor of creosote. The odor is almost always present in the chimney, but is usually carried up and away by the draft. Unfortunately, when warm weather comes, the draft is sometimes insufficient to carry the odors away and can even reverse itself, carrying the odor into the room. Warm weather may coincide with the rainy season, and high humidity further aggravates the problem by increasing the strength of the odor. Here are some steps to take to help eliminate the odor:

1. Have your chimney sweep clean your chimney. Often this will eliminate the problem. However, if you have clay flue tiles, creosote may have soaked into the tiles for years and a complete cleaning cannot get the soaked-in creosote out of the flue. The tiles may need to be removed and the chimney relined.
2. Install a cap. Having a chimney cap will help keep rain out of your chimney. This will help in preserving your chimney and eliminating odors. But cap or no cap, humidity can still get in the chimney.
3. There are several good deodorants on the market that can help eliminate the problem. There are deodorants that help absorb the odor through a raised wick. And there are sprays that can be used in the firebox to help eliminate odors.
4. Don't rule out the possibility that the odor in your chimney may be caused by dead or decaying animals. If you don't have a cap and have had birds, squirrels, or raccoons in your flue, this could be the problem.

5. One last culprit that may be causing chimney odor is badly deteriorated masonry. This can cause moisture to seep through to the inside of the chimney, causing a bad odor. In this case, you need to talk to your chimney sweep about getting the chimney repaired.

Chimney Stains

From time to time you may notice dark stains on the side of your chimney, particularly those chimneys that have a cap. The first inclination is to blame the cap. To say the stains are from the cap is much like saying you caught a cold from rainy weather. The rainy weather may contribute to your catching a cold, but a virus is causing your cold.

In the same respect, caps don't cause smoke stains on the chimney. This is evidenced by the number of chimneys with caps that don't have smoke stains. The cause is basically the same thing that causes glaze. Low burns and/or the use of unseasoned wood created cool flue gases (smoke). By the time the smoke exits the chimney it is near its condensation point. The smoke rises and mixes with the cold air and hits the cooler surface of the cap. This causes condensation to run down the sides of the chimney.

There is a simple solution to this: Operate the stove properly. Go back and reread the section on glaze (page 26). The same rules apply here. Chimney stains are really just an extension of glaze.

To remove the stains, use any heavy strength household detergent, a good stiff bristle brush, and lots of elbow grease. Or, consult your chimney sweep.

WOODSTOVE SAFETY

A woodstove is only as safe as its user. Here are a few guidelines to minimize your risk and make woodburning a safe, enjoyable experience:

1. Keep the chimney clean.
2. Be sure your chimney is in good condition — have it inspected annually and cleaned if necessary by your chimney sweep.
3. Don't use charcoal lighter fluid or kerosene to start the fire — use only commercially approved firestarters.
4. Be sure the damper and air inlet controls are open before starting a fire.
5. Don't burn trash in your woodstove.
6. Use a standing stove screen to protect children and pets from coming in contact with a hot stove.
7. Seasoned wood is safer than green wood. Hardwoods are safer than softwoods.
8. Never leave small children alone in a room with a hot woodstove. Warn them of the dangers of a hot stove.
9. Dispose of ashes in a covered metal container. Never assume they are cold.
10. Never burn artificial logs that are bound with wax or paraffin. These are dangerous to burn in enclosed spaces, and the slow burning of an airtight stove will create an odor from the wax.
11. Avoid long, low smoldering fires.
12. Never operate the stove with the doors open without using a spark screen (for models that are designed to burn this way).
13. Never "overfire" your woodstove. If the chimney connector gets red hot, a chimney fire may result if adequate amounts of creosote are present. Overfiring a stove can also damage it. On a black stove, white or grey spots may appear. On an enamel stove, the paint may bubble and peel.

Characteristics of Woods for Fireplace Use*

Species	Ease of starting	Coaling Qualities	Sparks	Fragrance
Apple	Poor	Excellent	Few	Excellent
Ash	Fair	Good	Few	Slight
Beech	Poor	Good	Few	Slight
Birch, white	Good	Good	Moderate	Slight
Cedar	Excellent	Poor	Many	Good
Cherry	Poor	Excellent	Few	Excellent
Elm	Fair	Good	Very Few	Fair
Fir, Douglas	Good	Low	Many	Good
Hemlock	Good	Low	Many	Good
Hickory	Fair	Excellent	Moderate	Slight
Locust, black	Poor	Excellent	Very Few	Slight
Maple, sugar	Poor	Excellent	Few	Good
Oak, red	Poor	Excellent	Few	Fair
Pine, white or yellow	Excellent	Poor	Moderate	Good

*Courtesy of Maine Bureau of Forestry and School of Forestry, Oregon State University.

Ratings for Firewood**

Type of Tree	Relative amount of heat	Easy to burn?	Easy to split?	Does it have heavy smoke?
HARDWOOD TREES				
Ash, red oak, white oak, beech, birch, hickory, hard maple, pecan, dogwood	High	Yes	Yes	No
Soft maple, cherry, walnut	Medium	Yes	Yes	No
Elm, sycamore, gum ...	Medium	Medium	No	Medium
Aspen, basswood, cottonwood, yellow-poplar	Low	Yes	Yes	Medium
SOFTWOOD TREES				
Southern yellow pine, Douglas fir	High	Yes	Yes	Yes
Cypress, redwood	Medium	Medium	Yes	Medium
White cedar, western red cedar, eastern red cedar	Medium	Yes	Yes	Medium
Eastern white pine, western white pine, sugar pine, ponderosa pine, true firs	Low	Medium	Yes	Medium
Tamarack, larch	Medium	Yes	Yes	Medium
Spruce	Low	Yes	Yes	Medium

**Courtesy of USDA Forest Service