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What to do with all that Ash?

Heating your home with wood is not only environmentally friendly, but it can also be much cheaper. Lots of people in this area heat their homes with outdoor wood burners, indoor fireplaces, or even little pot-belly stoves. However, there is one part of heating your home with wood...what to do with all that ash?

Burning wood will leave about 3-10% of the dry wood's weight as ash. A hot fire over a longer period with adequate oxygen will produce less ash, as all the organic compounds and volatiles are burned off, but some ash will remain. The ash left over is rich in calcium carbonate and several elements that can help raise soil pH and serve as fertilizer in the right quantities.

However, it might take more than you think to be useful as a soil amendment.

What's in ash?

Wood ash contains about 5-30% carbon, depending on how well the wood was burned. It's about 10 to 30% calcium (mostly as calcium carbonate), 3% potassium, and less than 1% phosphorus. It is also about 1% aluminum, magnesium, and iron each, and less than 1% of nearly every other nutrient. Ash has very little nitrogen because all the nitrogen is converted to gas during burning. Because ash is mostly calcium carbonate, the main use for wood ash is to raise pH in our acidic soils.

Ash for liming soils

It is first important to note that wood ash should only be used on lime-treated soils that are soil-tested and shown to be acidic. Soil with a pH above 6.4 is not an ideal candidate for ash or other liming compounds. Liming soil above 7.0 pH might actually reduce its productivity. Wood ash has a pH-increasing effect of 10 to 90% of that of actual fine lime (pure calcium carbonate). The high variation is because wood ash is highly variable in how it was burned and its composition. A general rule of thumb is say it has a 50% ECC value, or half of the liming effect of pure calcium carbonate. Let's say you soil-tested your garden and found a pH of 5.8 with a buffer pH of 6.7. Note that while pH tells you if you need lime, it is the buffer pH that tells you how much lime you need. You will need about 150 lbs dry ash per 1000 sq. ft., tilled into the top 6 inches of soil, to raise the pH to an ideal goal of 6.8. That's a lot of ash if you have a big garden. If you are only top-dressing soil and not tilling it in, remember that lime or ash will only change the pH in the top 2 or 3 inches of soil in a yard or pasture, therefore the application rate is only a third as much. When using ash, it's best to apply less than might be needed (like 100 lbs per 1000 sq ft in the example garden) and then test again next year. The high variability of the ash means you don't quite know just how much pH change you will really get.

Ash for Nutrients

Ash provides some potassium, but not much of the other major nutrients. The term potash, the synonym we use for the fertilizer potassium chloride, originally came from the way we used to make potassium fertilizer: running water through wood ashes, then boiling the lye water down into a powder. The 'ash' of a 'pot'. However, keep in mind that ash is only 3% potassium, or the equivalent of 4% K fertilizer. If you used 100 lbs of ash for that 1000 sq ft of garden, then you'll have applied 4 lbs of potash. This is actually a pretty reasonable and useful application. About 2 lbs of phosphorus fertilizer equivalent is a little less, but a reasonable application rate as well. The fertilizer value is merely a side benefit of its primary use as a liming material. Wood ash also provides small amounts of zinc, boron, and other micronutrients. It does, however, also contain trace amounts of heavy metals like cadmium, mercury, and lead, but these concentrations are rarely high enough to be a cause for concern with normal applications.

Applying Ash

As stated before, it's entirely necessary to take a soil test before knowing how much, if any, ash needs to be applied. Call your local extension office if you have questions about soil testing or need to borrow a soil probe. Soil testing is fairly cheap, ranging from \$13 to \$20, depending on the test. Wear gloves and proper clothing to keep from getting too much ash on your skin. It's not strong enough to be highly corrosive, but it will pull the moisture from your skin. Ash is also a fine, highly alkaline dust, so be careful not to inhale it. It is best to apply wood ash on windless days with high humidity.

Research has shown that wood ash actually has a better plant growth response than ag lime. This is probably because ash is very fine, so it reacts quickly in the soil, changing pH. The addition of soil nutrients likely helps as well. Please give us a call if you need any help with figuring out how much wood ash to apply to your yard, garden, or pasture.

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