

FOR IMMEDIATE RELEASE

For more information, contact James Coover
Crop Production Agent, Wildcat Extension District
jcoover@ksu.edu, (620) 724-8233

What To Do with All That Ash?

Heating your home with wood is not only environmentally efficient, but can be a lot cheaper too. Personally, my home is all electric heating, but since we put in an outdoor wood burner last fall, it looks like we are saving over \$200 a month. 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 total weight of the dry wood left behind as ash. A hot fire over a longer period with adequate oxygen will leave less ash as all the organic compounds and volatiles will burn off, but there will always be some ash left. The ash left is full of calcium carbonates and a number of elements that can be useful as liming and fertilizer in the right quantities. However, it might take more than you might think to be useful as a soil amendment.

What's in Ash?

Wood ash is about 5-30% carbon, depending on how well the wood was burned. It is about 10-30% percent calcium (mostly calcium carbonate), 3% potassium, and less than 1% phosphorus. It also has about 1% of aluminum, magnesium, and iron each, and less than 1% of nearly every other nutrient. Ash has very little nitrogen as all the nitrogen will convert into a gas when burning. Because ash is mostly calcium carbonate, the main use of wood ash is to raise potential of hydrogen, also known as pH, in our acidic soils.

Ash for Liming Soils

It is first important to note that wood ash should only be used in lime soils that are soil tested and shown to be acidic. Any soil with a pH above 6.4 is not an ideal candidate for ash or any other liming compound. Liming soil that is above 7.0 pH might actually make it less productive. Wood ash has a liming effect of 10-90% of that of 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 to say it has a 50% ECC value, or half of the liming effect of pure calcium carbonate.

Let us say you soil tested your garden and have a pH of 5.8 with a buffer pH of 6.7. (pH tells you if you need lime and buffer pH tells you how much lime you need.) You will need about 150 pounds of dry ash per 1000 square foot, tilled into the top six inches of soil, to raise the pH to an ideal goal of 6.8. That is a lot of ash if you have a big garden. Remember that lime or ash will only change the pH in the top two inches or so in a yard or pasture, so the application rate is only a third as much. When using ash, it is best to apply less than might be needed (like 100 pounds per 1000 square foot in the case of this garden), and then test again next year.

Ash for Nutrients

Ash does provide some amount of potassium, but not much else of the other major nutrients. The term potash, the synonym we use for the fertilizer potassium chloride, originally came from how we use to create potassium fertilizer by 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% potassium fertilizer.

If you used 100 pounds ash for that 1000 square foot area of the garden, that four pounds potassium is a higher rate but not an unreasonable application, though about two pounds of phosphorus fertilizer equivalent is a reasonable application rate as well. At four pounds potassium and two pounds phosphorus per 100 pounds ash, wood ash does apply some nutrients, but only when used at a very heavy rate needed to alter pH levels. The fertilizer value is merely a side bonus to its true use as a liming material. Wood ash also provides small amounts of zinc, boron, and a number of other micro-nutrients. 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

Wear gloves and proper clothing to keep from getting too much ash on your skin. It is 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, therefore reacts quickly in the soil to change pH. The addition of soil nutrients likely helps as well.

Like stated before, it is 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 how to soil test or need to borrow a soil probe. Soil testing is cheap, costing \$11 to \$17 depending on the test.

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.

For more information, please contact James Coover, Crop Production Agent, at jcoover@ksu.edu or (620) 724-8233.

###

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of K-State Research and Extension, Kansas State University, County Extension Councils, Extension Districts.