

## **JOHN'S CORNER**

### **ORGANIC FERTILIZERS AND NUTRIENTS 22: WOOD ASH**

*by John Ferguson*

Over the last few days during this holiday season due to the cold wet and gloomy days, we have had a fire in our fireplace most of the time. A warm crackling fire just takes the edge off the poor weather and brings us comfort. This is the time of year that most of us have fires in the fireplace or in the fire pit on our patios. However, the result of all these lovely fires is a lot of ash that needs to be disposed of, so what is a gardener going to do?

Wood ash has been used as a natural fertilizer for thousands of years as it retains many of the elements (nutrients) that were in the wood before burning. Things like calcium (Ca), Magnesium (Mg), Phosphorous (P), Potassium (K), and many more.

It was from the burning of wood in the 18th century that the name Potash (potassium carbonate,  $KCO_3$ ) came to be. Trees in America were felled, then burned and the ash was shipped and sold as a fertilizer in Great Britain.

During the burning of wood the nitrogen (N) and sulfur (S) become gasses and are lost. However, the carbonates and oxides will remain along with many minor and trace elements and become concentrated in the ash. These carbonates and oxides have been used for decades as liming agents to correct soils that are too acidic (wood ash can be very alkaline with a pH of 10-12).

In general hardwoods weigh more than softwoods hence after burning they produce more ash and they tend to have more nutrients per pound of ash. Studies have shown that hardwoods produce 3X as much ash as softwoods and contain 5X the amount of nutrients. Wood Ash typically contains: 10-25% Calcium, 1-4% Magnesium, 5-15% Potassium, 1-3% Phosphorous. If listed as a chemical fertilizer it would read 0-2-10. Note:

Wood ash tends to be very alkaline so do not use too much at one time or compost it first. Other nutrients include boron (B), copper (Cu), molybdenum (Mo), zinc (Zn), and a few others.

The ash from most fireplaces usually contains some small pieces of charcoal and even Bio-char. Both of these carbon rich substances are very porous and have a tremendous surface area. This will help increase the aeration of all soils, provide hiding places for good microbes, and increase the CEC (cation exchange capacity) of the soil, enabling the soil to hold and store more nutrients.



Many industries burn wood for a energy source. A University of Georgia study found there is over 3 million tons of ash produced annually in the USA that have to be disposed of. In the acid soils of the Southeast studies have shown that wood ash works better and give higher yields than using limestone to correct excess acidity issues.

A gardener may apply 1/2 to one pound of ash per year for each large shrub or rose bush. Always spread ash evenly so there is no clumps that would create a local alkalinity and salt problem.

For lawns some recommend 10-15 pounds of wood ash per 1,000 square feet.

Late fall is one of the best times to apply ash as the soil has all winter to utilize the nutrients and retain in a stable form.

A trick I use, is to collect the ash from my fireplace and place the ash into a 5 gallon bucket with a lid on it to keep it dry. When there is a breeze and just before it rains, I remove the lid and use my electric blower. I aim the airstream over the bucket and slowly lower it until it starts sucking out the ash and scatters it into the wind. Note: Do not aim the airstream directly into the bucket or it will get all over you. The wind will carry a



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very fine dusting of ash all over the yard. The rain (or sprinklers) will wash the ash into the soil. The minerals are returned to the soil where the microbes will make them available to the plants. The layer of ash is so small per square foot that it does not affect the pH of the soil. The next time I need to get rid of ash I wait till the wind is blowing from a different direction so eventually the whole yard is covered. I have been doing this for years with great results. Note: Do not apply if a heavy rain is expected as the nutrients in wood ash are in a water soluble form and can be easily leached before soil microbes can fix them or they can be absorbed by the soil clay or humus.

One study found that tomatoes that were fertilized with human urine and wood ash had 4 times the yield than the control plants. More studies are looking at human waste as a nutrient source due to eco-friendly toilets that divert urine as well as the composting toilets. It was estimated that a single person could supply enough urine to fertilize 6,300 tomatoes plants per year (Journal of Agricultural and Food Chemistry).

A new area of research around the world is on bio-fertilizers which are microbes that fix and provide nutrients to plants (future article). Studies have shown that wood ash stimulates bacteria like Bacillus and Azotobacter and the ash works better than limestone increasing their effectiveness.

Many plants love having wood ashes applied to them while others do not. I found a website that has a list of plants that like wood ashes (or do not):

<http://askville.amazon.com/types-outdoor-garden-plants-wood-ashes-added-soil/AnswerViewer.do?requestId=30317496ww>.

#### **OTHER USES:**

Another use for the wood ash is to place in bowls where birds can access them. They will take a dust bath that helps them control insect on them.

When dry wood ash is often used to repel certain garden pests like slugs and snails that become dehydrated when they touch it. They also do not like the chemical salts in the ash or the abrasiveness. After wetting it quickly becomes ineffective.

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101 Sherbrook Circle • Conroe, Texas 77385-7750  
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For years many folks have used ash mixed with water as a cleaning agent since it is abrasive. For years many people used this to polish their silver. In third world countries people still use ash to clean their dishes and add to their food to increase its nutritional content.

I have read that folks up North apply wood ashes to their slippery sidewalks in winter. It both gives extra traction and chemically it contains salts, which causes ice to melt quicker.

Others have reported that just a little ash mixed with water is a great way to control unwanted algae.

Wood ash with a high char content can be very effective in odor control from smelly shoes to helping out a pet that has been sprayed by a skunk. It will also help control odors with a out-of-balance compost pile.

**NOTES:**

Do not use ash from treated wood, painted wood, creosoted wood or burning trash or cardboard as these products contain many chemicals that are toxic to plants and humans.

Wood ash if applied with synthetic fertilizers such as ammonium sulfate, ammonium nitrate or urea will produce ammonium gas which is toxic.

If one keeps their wood ashes dry, then they will keep indefinitely.

Ash from solid waste incinerators or from burning of coal is toxic (not a wood ash).

**SUMMARY:**

Wood ashes are another organic tool in a gardeners toolbox and is a great way to supply phosphorous, potassium and calcium to our soils, correct acidity problems or just help out in a compost pile.

**PROS:**

- good source of phosphorous, potassium and calcium
- inexpensive (free)

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- good availability
- nutrients rapidly available
- easy to use
- often used in compost piles as a calcium and phosphorus source
- renewable resource
- good for lime loving flowers (clematis, Hydrangea, etc.)
- good for almost all bulbs
- pest repellent
- very alkaline hence good to correct acidic soils
- low in heavy metals

**CONS:**

- not available commercially
- may be dusty (wear a mask)
- not a complete fertilizer
- due to its alkalinity too much can cause nutrient tie-up problems
- not good for seeds
- nutrients will leach if applied during a heavy rain