



# Recommended Practices for Using Wood Ash as an Agricultural Soil Amendment

This publication covers a procedure for applying wood ash as a lime substitute on agricultural lands. This method can be used by manufacturers and dealers who wish to supply wood ash or by landowners who wish to receive wood ash. While the recommendations in this procedure carry no regulatory power, the Environmental Protection Division of the Department of Natural Resources and the Georgia Department of Agriculture have reviewed and accepted them. If the practices in this publication are followed, there should be no adverse environmental effects or regulatory consequence from the land application of wood ash. These recommendations are intended to facilitate the process of land applying wood ash. They take full advantage of the liming and nutrient values inherent in wood ash and reduce the volume going into Georgia's landfills.

## DESCRIPTION

Wood ash is the ash from the combustion of the following: bark, wood, sawdust, leaves, woody debris, pulp, sludge from pulp and paper waste water treatment systems, and unbleached wood fiber. Except for the auxiliary use of gas or oil to start the process or for routine maintenance, wood ash does not include ash from mixed fuels or other products. These procedures do not apply to any materials registered with the Georgia Department of Agriculture and do not replace or circumvent any state regulations.

Mixed ashes and other residuals from pulp and paper manufacturers also have value as a soil amendment and lime substitute, but they do not meet the definition of wood ash as defined in this publication. The University of Georgia, in cooperation with several other organizations, is studying many of these other by-products. If these studies indicate that land application of these materials is appropriate, procedures for their use will also be developed.

## Testing

Any supplier wishing to make wood ash available to the public for land application should first test the product. Testing should include an analysis for nitrogen (N), phosphorus (P), potassium (K), sodium (Na), calcium (Ca), magnesium (Mg), lime equivalency (CCE), and the nine metals outlined in EPA regulations for application of municipal sludge (40 CFR part 503.13) and listed in Table 1. All analysis should use EPA approved procedures and laboratories. If any of the metal concentrations exceed the pollutant concentrations outlined in Table 1, the wood ash should not be land applied using the recommendations in this publication.

**Table 1. Pollutant concentrations from 40 CFR part 503.13.**

Pollutant	Pollutant Concentration (milligrams/kilogram)*
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Molybdenum**	18
Nickel	420
Selenium	100
Zinc	2800

\* Dry weight basis, 1 mg/kg = 1 ppm.

\*\* The limit for molybdenum is no longer part of the 503.13 regulations.

**Note:** These are the pollutant concentrations from the EPA regulations for land application of municipal sludge. They are used as a guideline in this publication. The wood ash should have concentrations below these pollutant levels; however, they do not need to meet all of the conditions outlined in 40 CFR part 503.13. If the concentration of any metal exceeds these concentrations, then do not land apply the wood ash.

Test the ash using weekly composite samples – two to three samples per day over five days – twice per year. In addition, the supplier should retest the ash after any significant process modification or if changes in raw material inputs have occurred. The supplier should keep records of all test results for at least three years, and the records should be provided upon request to the county extension office, landowner or commercial applicator so application rates can be calculated.

## APPLICATION

Base the amount of wood ash to be land applied to a particular area on the desired soil pH and nutrient requirements of the crop. Each landowner/farm operator who wishes to receive bulk wood ash should test the soil on each site before each wood ash application. As a lime substitute, calculate application rates from liming rate recommendations, the soil test pH for the site, and the lime equivalency (CCE) of the ash. Use the Georgia Extension Service's *Soil Testing Handbook* or laboratory recommendations to determine the proper liming rates.

While the application rates should primarily depend on the lime requirement to bring the soil to the optimum pH, the nutrient contribution of the ash may also be calculated so fertilizer inputs can be reduced where

appropriate. Using the application rate, also estimate the total amount of wood ash required for each location based on the land available for application. It is the responsibility of the landowner or farm operator to adhere to these requirements for the application of this product. All soil testing and application rate calculations are available through the University of Georgia Cooperative Extension Service; however, any qualified laboratory can provide these services.

Before providing wood ash to any farmer/landowner, the wood ash supplier should ensure that the following requirements are met: (1) the wood ash has been tested and the test results did not exceed the allowable metal concentrations, (2) at each application site, soil testing has been performed and the optimum application rate has been calculated, (3) each landowner has received a copy of the University of Georgia Cooperative Extension Service bulletin *Best Management Practices for Wood Ash Used as an Agricultural Soil Amendment*; (4) each receiver of ash has completed and returned to the supplier an acceptance form agreeing to take ownership, control and responsibility for this material as provided. To ensure that these conditions are met, the supplier may wish to keep records of each transaction. Include the name and address of the person receiving the wood ash, the amount, and the date provided.

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