

NEWMOA FACT SHEET

Beneficial Use of Wood Ash on Agricultural Land

April 6, 2001

This fact sheet is intended to provide general information to potential users of unadulterated¹ wood combustion ash as an agricultural amendment. It is the responsibility of the producer and user of the ash to determine the appropriateness of a particular application and to select applicable tests and specifications to facilitate its use and environmental protection. Potential users of unadulterated wood combustion ash on agricultural land should contact the appropriate state regulatory program to identify specific use conditions and permit requirements. A listing of state contacts is located at the end of this fact sheet.

MATERIAL DESCRIPTION

Wood ash is produced in large quantities from wood-burning energy plants. Unadulterated wood ash is derived from the burning of clean and/or virgin wood, and consists of bottom ash, fly ash or a combination of the two. The characterization of wood ash is dependent upon the type of wood burned. Generally, hardwood ash contains a higher percentage of nutrients than ash from softwoods, and hardwoods produce more pounds of ash per pound of wood burned. In terms of agricultural nutrients, wood ash generally contains 50-70 percent calcium and 6-8 percent potassium, and some magnesium, along with trace quantities of phosphorus and no nitrogen.

BASIC DESCRIPTION OF USE

Unadulterated wood ash can have beneficial agricultural properties either as a liming material or a fertilizer. Therefore, the proper utilization of unadulterated wood ash could be a benefit to farmers and save valuable landfill space. Wood ash raises the alkalinity (pH) of the soil similar to limestone. However, wood ash has a high water solubility and quickly changes the pH, whereas limestone acts more slowly (over six months or so).

Wood ash can help a composting operation maintain a neutral condition which is the best environment to help microorganisms break down organic materials. An appropriate quantity of ash could be applied on each layer of compost as the pile is built.

CONCERNS

The greatest concern is that the wood burned might contain contaminants which could result in contamination of the ash, particularly with metals. Potential users of wood ash as an agricultural

¹ Unadulterated wood means wood that does not contain any non-wood materials, has not been chemically-treated, and is free of paint or other coatings.

amendment should verify that the ash is free of contamination. The quantity of wood ash to be land-applied and the results of laboratory analysis would be necessary to determine the appropriateness of using wood ash as an agricultural amendment. Wood ash is a strongly alkaline material and care should be used when handling, such as using eye protection and gloves, at a minimum.

All the nitrogen in the wood is lost as a gas when it is burned, so if wood ash is to be used as a fertilizer, nitrogen would need to be supplied from another source. However, wood ash should not be added to nitrogen fertilizers such as ammonium sulfate (21-0-0-24S), urea (46-0-0) or ammonium nitrate (34-0-0) because these fertilizers lose their nitrogen as ammonia gas when mixed with high pH material. Wait at least a month between the application of wood ash and the application of nitrogen fertilizer.

Lastly, as stated above, wood ash immediately raises the soil pH and therefore, over application is a concern. The application rate should be limited to the nutrient/liming needs of the crop grown. Wood ash should not be applied to soil with a pH above 7.0, or if potassium levels are excessive. For soil with a pH near the ideal pH range (6.5 to 7.0), a safe rate of wood application would be 20 pounds per 1,000 square feet per year. Acidic soils could use more. Twenty pounds of wood ash is roughly equivalent to 6 pounds of ground limestone.

TECHNICAL/SCIENTIFIC STATUS

- 1) **Standards:** Liming in New Hampshire RSA 431:22-31 and Chapter Agr 2000. Fertilizer in New Hampshire RSA 431:1-20 and Chapter Agr 1100.
- 2) **R&D:** University of New Hampshire, Kingman Farm R&D Reports.

APPLICATIONS/CASE STUDIES

- 1) **Full Scale:** Agricultural Sites in New Hampshire.

REGULATORY STATUS

- 1) **Connecticut:** Requires a General Permit pursuant to Section 22a-209f of the Connecticut General Statutes and adherence to technical guidance (document available from DEP).
- 2) **Maine:** Would need to obtain DEP approval through the beneficial use determination process. DEP has approved, on a case-by-case basis, the use of wood ash in road construction.
- 3) **Massachusetts:** Beneficial use determination is required pursuant to 310 CMR 19.60, Permit code BWP-SW 13. DEP has approved, on a case-by-case basis, the use of wood ash as a soil amendment, a landfill component and a compost additive.
- 4) **New Hampshire:** The agricultural utilization of wood ash is addressed through Chapter Env-Wm 3400 of the New Hampshire Solid Waste Rules including the Joint Policy on the Use of Wood on Agricultural Land, the liming material provisions under RSA 431:22-31 and Chapter Agr 2000, and the fertilizer criteria under NH RSA 431:1-20 and Chapter Agr 1100.
- 5) **New York:** The use of unadulterated wood ash as a soil amendment or fertilizer is a predetermined beneficial use (NYCRR Part 360-1.15(b) (13). However, the

application rate is limited to <16 dry tons per acre per year.

- 6) **Rhode Island:** Marketer/potential user of material must obtain DEM approval through the beneficial use determination process in order to obtain an exemption from the solid waste regulations (chapter 23-18.9).

- 7) **Vermont:** Wood ash generated by the McNeill Electric Generation Plant is approved for use according to the May 6, 1998 *Practice Concerning Regulation of Wood Ash Generated by the Combustion of Clean, Untreated Wood Chips at the McNeill Electric Generation Plant and Utilized by Shelburne Limestone and by Other Individuals*. Use of wood ash generated by any other source must submit a written request to the DEC Solid Waste Management Program in accordance with their July 2000 *Procedure Addressing Acceptable Uses of Solid Waste*. The use of wood ash on agricultural land is also regulated by the Vermont Department of Agriculture under Accepted Agricultural Practices.

For More Information Please Contact:

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| <p>In Connecticut: Oswald Inglese Department of Environmental Protection 79 Elm Street Hartford, CT 06106 (860) 424-3725</p> | <p>In Maine: James Glasgow Department of Environmental Protection 17 State House Station Augusta, ME 04333 (207) 287-7719</p> |
| <p>In Massachusetts: Sean Griffin Department of Environmental Protection One Winter Street Boston, MA 02108 (617) 292-5967</p> | <p>In New Hampshire: Mike Sills Department of Environmental Services 6 Hazen Drive Concord, NH 03301 (603) 271-2907</p> |
| <p>In New York: Jeff Schmitt Department of Environmental Conservation 50 Wolf Road Albany, NY 12233 (518) 457-6072</p> | <p>In Rhode Island: Chris Shafer Department of Environmental Management 235 Promenade Street Providence, RI 02908 (401) 222-2797</p> |
| <p>In Vermont: Bryan Harrington Department of Environmental Conservation 103 South Main Street Waterbury, VT 05671 (802) 241-3473</p> | <p>At NEWMOA: Jennifer Griffith NEWMOA 129 Portland Street, 6th Floor Boston, MA 02114 (617) 367-8558, ext. 303</p> |

The Northeast Waste Management Officials' Association (NEWMOA) is a nonprofit, nonpartisan interstates organization that addresses regional waste and pollution prevention issues. The membership is composed of state environmental agency directors of the hazardous waste, solid waste, waste site cleanup, pollution prevention and underground storage tank programs in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. New Jersey recently rejoined NEWMOA (March 23, 2001) and therefore, did not participate in the development or review of this fact sheet. NEWMOA provides a forum for increased communication and cooperation among the member states, a vehicle for the development of unified position on various

issues and programs, and a source for research and training.