

National Network for Use of FGD Gypsum in Agriculture

Agricultural and Industrial Uses of
FGD Gypsum Workshop

Atlanta, Georgia
October 23-24, 2007

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National Network of Sites

Objective

Increase use of FGD products in agricultural applications

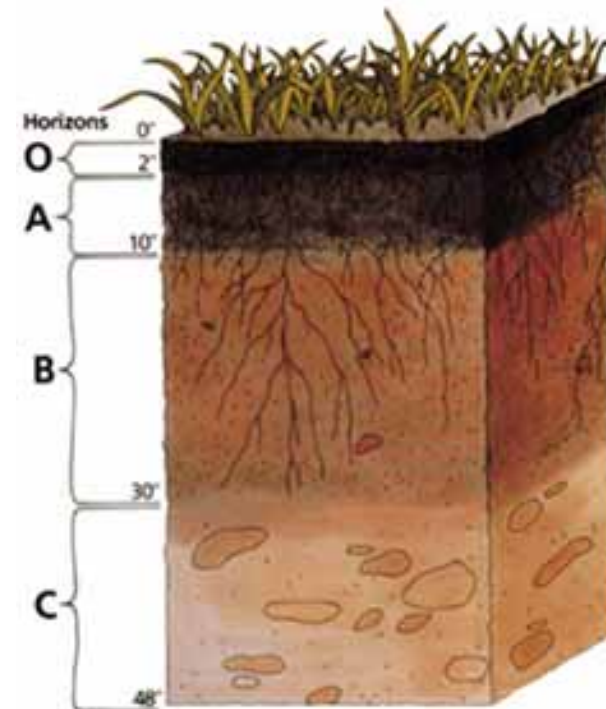
The network will serve to:

- Demonstrate agricultural benefits across different regions, soil types, and crops
- Address environmental acceptability of agricultural use
- Act as a resource for technical questions
- Aid in marketing to the agricultural community



National Network of Sites

- The Ohio State University coordinates all network activities
 - Development of uniform protocols for all sites
 - Laboratory analysis
 - Data evaluation
 - Report preparation
 - Website
- Utility Sites
 - Co-funded
 - Local soils, crops
 - Local agricultural expert



Experimental Design

<p>Replicate 1</p> <p>FGD gypsum (3 rates) Replaced material (3 rates) Control (no application)</p>	<p>Replicate 2</p> <p>FGD gypsum (3 rates) Replaced material (3 rates) Control (no application)</p>
<p>Replicate 3</p> <p>FGD gypsum (3 rates) Replaced material (3 rates) Control (no application)</p>	<p>Replicate 4</p> <p>FGD gypsum (3 rates) Replaced material (3 rates) Control (no application)</p>

Randomized complete block

Data Collection

- Crop yield
- Soil quality
- Soil water quality
- Plant tissue metals
- Mercury
- Meteorological data



Data Collection

➤ Analysis of FGD Gypsum and Other Amendments

- Total neutralizing power and pH
- Soluble salts (electrical conductivity)
- Total S, N, C
- Total composition (digestion & ICP)
P, K, Ca, Mg, S, Al, B, Cu, Fe, Mn, Mo, Na, Zn
As, Ba, Be, Cd, Co, Cr, Li, Ni, Pb, Sb, Se, Si, Sr, V
- Hg by cold vapor atomic fluorescence spectrometer

Data Collection

➤ Soil Analysis

- Lime test index & pH
- Available P (Bray 1 extraction)
- Exchangeable K, Ca, Mg, Na (ammonium acetate extraction)
- Cation exchange capacity and percent base saturation
- Soluble salts (electrical conductivity)
- Total S, N, C
- Organic matter by loss on ignition
- Mehlich 3 extraction with ICP analysis (P, K, Ca, Mg, S, Al, Cu, Fe, Mn, Zn)
- Total composition (digestion & ICP)
P, K, Ca, Mg, S, Al, B, Cu, Fe, Mn, Mo, Na, Zn
As, Ba, Be, Cd, Co, Cr, Li, Ni, Pb, Sb, Se, Si, Sr, V
- Hg by cold vapor atomic fluorescence spectrometer

Data Collection

➤ Plant Tissue Analysis

- Total S, N, C
- Total composition (digestion & ICP)
P, K, Ca, Mg, S, Al, B, Cu, Fe, Mn, Mo, Na, Zn
As, Ba, Be, Cd, Co, Cr, Li, Ni, Pb, Sb, Se, Si, Sr, V
- Hg by cold vapor atomic fluorescence spectrometer

➤ Soil Water Analysis

- Anions
- Dissolved constituents (ICP)
P, K, Ca, Mg, S, Al, B, Cu, Fe, Mn, Mo, Na, Zn
As, Ba, Be, Cd, Co, Cr, Li, Ni, Pb, Sb, Se, Si, Sr, V
- Hg by cold vapor atomic fluorescence spectrometer

National Network of Sites

- North Dakota
 - 2 test plots
 - Planted in Spring 2007
 - Recently harvested
- New Mexico
 - Delayed in Spring 2007
 - Planned for Fall 2007
- Indiana
 - Planned for Fall 2007
- Arkansas
 - Planned for Fall 2007
- Alabama/Tennessee
 - Planned for Spring 2008

