Precision Soil Sampling

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Why precision soil sampling?

• Traditional soil sampling results in uniform management of fields
• Often leads to an over or under application of lime and fertilizer
• Negative impact on soil and water quality

Precision soil sampling adjusts farm practices to manage variability at smaller increments within a field with the goal of improving crop performance and environmental quality.
Why precision soil sampling?

• Target inputs to meet production potential
• Reduce excess applications
• Enhance environmental quality
• Manage field variability
• Increase efficiency of nutrient applications
Research in Alabama has shown that traditional soil sampling methods do not accurately characterize nutrient needs in fields with moderate to high soil variability.
Grid Sampling

- Divide the field into areas of defined size using GIS software
- Soil samples taken from within each grid area
  - Grid point
  - Grid cell
- Grid ID is matched with soil sample ID
Grid Sampling

1. Create Field Boundary
2. GPS + PDA/computer
3. Assign Grid
4. Match Sample ID to grid
Grid Sampling

• Advantages
  – Assess nutrient variability present in field
  – Field history
  – Identify hot spots/trouble areas
  – Minimize excess nutrient application
  – Target inputs where needed
  – Minimum skill level
Grid Sampling

- Disadvantages
  - No justification for grid sizes
  - Grid arbitrarily placed in field
  - Ignores soil properties and field characteristics
  - Labor and time intensive
  - Expensive
Zone Management

- Field is divided into regions based on soil and/or yield properties
- Zones created within a GIS
- Composite samples taken for each zone
- Zone ID consistent with sample ID
Zone Creation

Zone Creation Tools

Farmer Knowledge

Precision Ag Team

Alabama A&M and Auburn Universities
Zone Sampling

- Advantages
  - Zones delineated based on past field performance and intrinsic properties
  - Classifies spatial variability
  - Reduced time and labor
  - More economical
Zone Sampling

• Disadvantages
  – Greater initial time and financial investment to implement zone management
  – Higher skill level required
  – Requires field knowledge
Prescription Map

• Provides rate and application location information to controller
• Tells variable rate equipment where and how much
• Created using GIS software
• Links soil test recommendations to appropriate grid or zone
Prescription Map

<table>
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<tr>
<th></th>
<th>Field Name</th>
<th>Sample ID</th>
<th>LIME REC</th>
<th>NRATE</th>
<th>P2O5</th>
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</table>
Prescription Map

1. Prescription Map
2. Computer/Controller
3. VR Application
As-Applied Map

[Image of tractor spreading fertilizer]

[Map showing various application rates: 0 lbs, 20 lbs, 40 lbs, 60 lbs, 80 lbs, 20 lbs, 60 lbs, 80 lbs, 80 lbs]
Things to consider

• Time and financial investment
• Who will be doing the work and what kind of support is available for getting started?
• What information is available?
• What equipment is needed and/or available?
• Will there be a net return on investment?
• Suitability of the field to precision sampling
Questions?