Sampling soils for testing

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Importance of taking good soil samples

- Economics
- Nutrient Management
When to take soil samples

- Anytime is acceptable
- Spring vs fall – differences exist
- Be consistent
Where to take soil samples

Avoid sampling areas such as:

- Dead furrows or back furrows
- Lime, sludge or manure piles
- Animal droppings
- Near fences or roads
- Rows where fertilizer has been banded
- Eroded knolls
- Low spots
Goals of a soil sampling program

The most common objectives are to:

1.) Obtain samples that accurately represent the field from which they were taken;

2.) Estimate the amount of nutrients that should be applied to provide the greatest economic return to the grower; and

3.) Provide some estimate of the variation that exists within the field and how the nutrients are distributed spatially.
Guidelines for sampling conventional fields (not site specific)

Be consistent in depth of sampling
Impact of sample depth on measured soil pH levels

- 6 inch sample – pH = 6.6
- 8 inch sample – pH = 6.2
Impact of sample depth on measured soil test P levels

- 6 inch sample = 25 ppm P
- 4 inch sample = 30 ppm P
- 8 inch sample = 21 ppm P
Research indicates that where the objective is to get an average P and K soil test value, a composite of 20 cores will be within about 10% of the true mean about 85% of the time.

Most north central states recommend 10-20 cores per sample.
WI Soil Test Program

More samples per field – allows for the elimination of “outliers”

- 1 or 2 samples per field – none can be eliminated
- 3 or 4 samples per field – one can be eliminated
- 5 or more samples per field – up to two can be eliminated
Recommended sample intensity for “uniform” non-site-specific fields

<table>
<thead>
<tr>
<th>Suggested sample number*</th>
<th>Field size (acres)</th>
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<tbody>
<tr>
<td>2</td>
<td>1–10</td>
</tr>
<tr>
<td>3</td>
<td>11–25</td>
</tr>
<tr>
<td>4</td>
<td>26–40</td>
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<tr>
<td>5</td>
<td>41–60</td>
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<td>6</td>
<td>61–80</td>
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<tr>
<td>7</td>
<td>81–100</td>
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</tbody>
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*10 cores/sample minimum
Recommended W-shaped sampling pattern for a 20-acre field

*Each sample should be composed of at least 10 cores
Options for sampling site specific fields

- Grid sampling
- Management zone sampling
Grid sampling

Unaligned systematic grid point method

- 300 ft. grid – if P and K are in the non-responsive categories
- 200 ft. grid max. – if P and K are in the responsive categories
An unaligned grid pattern for sampling site-specific fields
Use various layers of information:

- Yield maps
- Aerial photos – bare soil or canopy
- Soil EC measurements
- Others
How often to sample

- Field crops - every 3 to 4 years or once in a rotation

- High value crops – may need to sample more frequently (1-2 years)
Fields requiring special sampling procedures

- Chisel plowing and offset disking - 3/4 of tillage depth
- Till-plant and ridge tillage - Sample ridges to the 6-inch depth and between rows (furrows) to a depth of 4 inches
- No-till – 0-2 in. sample for pH, 0-6 for nutrients