2011 SMFD
NUTRIENT MANAGEMENT ISSUES
FOR SOYBEAN PRODUCTION

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Nutrient Management Issues for Soybean Production

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Lime use to amend acid soils

In 2010, soil tests with and without lime applied were: Mehlich-3 P 25 and 12 ppm; pH 6.0 and 5.4, and Zn 1.1 and 0.8 ppm.

Determine the variability in soil pH. Is variable rate or site-specific application justified?

How should lime be applied?
- blanket application
- management zones
- grid sampling
- on-the-go sensor mapping?

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The agronomics and economics of variable rate liming

Trials in Nance, Saunders, and Wayne Counties
4 treatments
2 reps

Chlorosis Management

<table>
<thead>
<tr>
<th>Soybean chelate Fe</th>
<th>Mean of 3 fields</th>
<th>Chlorotic area</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb/ac</td>
<td>bu/acre</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>64.6</td>
<td>64.9 c</td>
</tr>
<tr>
<td>2</td>
<td>66.5</td>
<td>67.8 b</td>
</tr>
<tr>
<td>3</td>
<td>66.9</td>
<td>68.7 a</td>
</tr>
<tr>
<td>4</td>
<td>64.8</td>
<td>63.7 c</td>
</tr>
</tbody>
</table>

Site-specific options for chlorosis-prone areas:
- Plant tolerant cultivars
- Use Fe chelate starter
- Plant another crop.

Soybean N need: starter N and foliar

Starter N?
1. 1.50 lb in ND and RRV of MN
2. 6% yield increase with 15 lb in Brookings, 2x2
3. Ogallala
4. No yield advantage further south, e.g. MN, MO
5. What about no-till irrigated C-C-SB?

Foliar applied macro and micro nutrients
1. Generally low chance of profitable response.
2. New products (slow release N) and higher yields

Soybean N need: starter N and foliar

SMFD trials
1. Control: no starter N or foliar
2. 0 starter with row cleaning
3. 5 lb starter N in 5 gal
4. 10 lb starter N in 10 gal
5. 10 lb starter N injected 2” to the side of the row
6. 10 lb starter N dribbled over the row
7. 2 gal/acre of Nachurs N-Rage (23-4-2+0.05%Mn; 67% triazone N) + 1 pt/ac SoyGrow (0.36%Fe; 0.5%Mg, 2.6%Mn; 1.5%Zn) at V3-V5
8. N-Rage + SoyGrow at R2-R3
9. N-Rage + SoyGrow at V3-V5 and R2-R3
10. 5 lb starter N and N-Rage + SoyGrow at V3-V5 and R3-R3
Soybean N need: podfill

N application at beginning podfill, e.g. 25-30 lb through fertigation
Little or no response when yield <60 bu/A; inconsistent if >60 bu/A

Nebr. 2009-10: 56 trials. No more gain with 54 lb N or N+4.5 lb S.

Yield increase, applied, >60 bu/A
South-central 2.5
Northeast 1.5
Southeast 0.3

Seasonal pattern of soybean N utilization
(Harper, 1974 and Harper and Hageman, 1972)

High Yield Soybean Trial

<table>
<thead>
<tr>
<th>5 lb. Starter N &amp; Seed Fertilizer</th>
<th>Foliar NPK + Micro at R6/A</th>
<th>BioForge Seed Treatment</th>
<th>Optimizer 600 Seed Treatment</th>
<th>Clip with Lawn Mower at V2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Full</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Full with Cobra</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Minus Starter N</td>
<td></td>
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</tr>
<tr>
<td>4. Minus Foliar</td>
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<tr>
<td>5. Minus BioForge</td>
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<tr>
<td>6. Minus Optimizer 600</td>
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<tr>
<td>7. Minus Clipping</td>
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<tr>
<td>8. Minus All</td>
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</tbody>
</table>

Cobra at 12.5 oz/ac at V2

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