Foliar Fertilization of Soybeans

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Application opportunities:

1. Early season N,P,K (V4-V6)

2. Midseason micro-nutrients (B,Mn)

3. Podfill N,P,K,S (R2-R7)
Field trial success:

Iowa early season studies

1. Increases at 7 of 48 sites; decreases at 2 of 48 sites; average + 0.80 bu/a

2. Increases at 3 of 27 sites; decreases at 3 of 27 sites; average + 0.27 bu/a

3. No yield increases or decreases at 18 sites; average + 0.71 bu/a

Responses more likely with dry spring/early summer, where available P/K low, plant growth poor.

Application costs exceeded benefits
Podfill trial results:

Garcia and Hanway (1976)

Exp 1 = yield +1.2 to 7.0 bu/a
       average = +3.62 bu/a

Exp 2 = yield -2.5 to +15.5 bu/a
       average = +2.74 bu/a

Exp 3 = yield +22.2 to +23.4 bu/a

Exp 4 = yield -3.6 to +8.6 bu/a
       average = +7.26 bu/a

Exp 5 = yield -0.5 to +5.7 bu/a
       average = +6.40 bu/a

Exp 6 = yield -5.8 to +6.6 bu/a
       average = -5.16 bu/a
<table>
<thead>
<tr>
<th>Location</th>
<th>Change (bu/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>-3.1</td>
</tr>
<tr>
<td>Maryland</td>
<td>+8.89</td>
</tr>
<tr>
<td>Minnesota</td>
<td>+0.65</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>+1.41</td>
</tr>
<tr>
<td>Georgia</td>
<td>-4.43</td>
</tr>
<tr>
<td>TVA various loc.</td>
<td>-5.51</td>
</tr>
</tbody>
</table>
Micronutrient studies mixed

- B increased pods/branch on sandy, low OM soils worse
- Mn increased yield on high OM, high pH soils
- Premium mixes promoted
Bottom line:

• Responses to foliar NPKS
  early -- unlikely
  podfill -- occasionally

• Responses to foliar micronutrients
  Soil specific
  Nutrient specific
  Multiple applications often better