2007 Corn Production Considerations

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The Rotation Decision?

- Traditional Corn-Soybean
- Corn-Corn-Soybean
- Continuous Corn

Problems and Considerations

Why Corn-Bean Rotation

- Higher yields (?)
  - Rotation Effect...
- Less pest problems (?)
  - Weeds, insects, disease
- Lower fertilizer costs
- Less crop residue
Challenges for Corn on Corn

- Lower Yields (especially with stress)
- Increased Pest Problems
  - Especially insects & diseases
  - Hybrid selection more critical
- Higher N Rates & Costs
- More crop residue to manage
  - Field selection important
  - More tillage?
  - Planting operations more critical

Yield Difference: C-SB and C-C

32 Site-Years in Iowa, at 240 lb N/acre

<table>
<thead>
<tr>
<th>Year</th>
<th>C-S</th>
<th>C-C</th>
<th>Difference</th>
</tr>
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<tbody>
<tr>
<td>2000</td>
<td>160</td>
<td>156</td>
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<tr>
<td>2001</td>
<td>146</td>
<td>115</td>
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<td>2002</td>
<td>152</td>
<td>122</td>
<td>30</td>
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<tr>
<td>2003</td>
<td>163</td>
<td>117</td>
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</tr>
<tr>
<td>2004</td>
<td>204</td>
<td>200</td>
<td>4</td>
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<tr>
<td>2005</td>
<td>193</td>
<td>163</td>
<td>30</td>
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<tr>
<td>Average</td>
<td>170</td>
<td>144</td>
<td>26</td>
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J.E. Sawyer, Iowa State University

Corn Yield - % of Corn-Soybean Rotation

- 23-YR Data Set
- Last 4-YR Data Set

-10% -7%
Insect issues...

- Primary insect to consider in short-term corn after corn is corn rootworm.
  - Consider a soil insecticide, seed treatment, or transgenic Bt hybrid.
- Corn borer likely not worse in 2nd-yr corn, but pressure could elevate in lengthier continuous corn systems.

CRW control options...

- Most consistent control:
  - Bt-RW hybrids (transgenics)
  - Soil applied granular insecticides
- Less consistent control:
  - Liquid insecticides.
  - High rate seed applied insecticide.

These differences are most pronounced where rootworm pressure is severe (high populations).
Seed-Applied Insecticides

- Newer insecticide class: Neonicotinoids
  - Poncho™, Cruiser™, Gaucho™
  - Systemic to roots & new leaves
- Targeted towards...
  - Secondary soil insects (low rate formulations)
  - Corn rootworm (high rate formulations)
- Pre-applied to seed by seed company.
  - Sometimes must be requested w/ seed order.
  - ~ $4 – $6 per acre (low rate formulations)
  - ~ $18 – 20 per acre (high rate formulations)

Corn Pests
- western bean cutworm

- Relatively new corn pest for Iowa
- No difference between corn ground and soybean ground
- Populations may increase with increased corn acreage

Corn Pests
- western bean cutworm

- Injury:
  - Different from other cutworms; ear feeders
  - Economic damage may occur when multiple cutworms feed on an ear
  - Injury allows pathogens into the ear
Field Selection for Corn on Corn

- Consider fields with past soybean disease problems
  - Sudden death syndrome
  - Soybean cyst nematode

Soybean Yield - % of Soybean-Corn Rotation
IA Studies

- Soy-Corn
- Soy-Corn-Corn
- Continuous Soy

Plant Disease Management

Some seedling blight diseases thrive in cool, wet soils early in the season.
- Avoid excessively early planting in poorly drained soils.
- Avoid fields for corn on corn that tend to be cold & wet in spring.
Plant Disease Management

More corn residue can increase the severity of some foliar diseases such as gray leaf spot.
- Hybrid selection and occasionally foliar fungicide applications can manage diseases.

Plant Disease Management

- More corn residue can increase problems with stalk and ear rots.
- Scout fields and harvest in a timely fashion if problems occur.

Nutrient Requirements

<table>
<thead>
<tr>
<th>Nutrient Balance Summary</th>
<th>Rotation</th>
<th>N (lb/yn)</th>
<th>P2O5 (lb/yn)</th>
<th>K2O (lb/yn)</th>
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<tbody>
<tr>
<td>Corn/Soybean</td>
<td>63</td>
<td>53</td>
<td>66</td>
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<td>Corn/Corn/Soybean</td>
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<td>58</td>
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<tr>
<td>Corn/Corn/Corn/Soybean</td>
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<td>56</td>
<td>58</td>
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<tr>
<td>Continuous Corn</td>
<td>169</td>
<td>58</td>
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<table>
<thead>
<tr>
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<th>% of Corn/Soybean</th>
<th>N</th>
<th>P2O5</th>
<th>K2O</th>
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</thead>
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<td>Corn/Soybean</td>
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<td>0%</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>Corn/Corn/Soybean</td>
<td>145%</td>
<td>108%</td>
<td>89%</td>
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<tr>
<td>Corn/Corn/Corn/Soybean</td>
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<td>108%</td>
<td>87%</td>
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<tr>
<td>Continuous Corn</td>
<td>270%</td>
<td>108%</td>
<td>70%</td>
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</table>
Tillage Considerations

- More Residue to Manage With Corn on Corn
- More Difficult to Make No-till Work on Corn Ground
- More Residue than in the Past – Higher Populations & Yields and Bt Corn

Stand establishment issues

- Greater residues of corn/corn often delay soil warm-up & drying in spring; can also provide greater challenges with the planting operation if no-till.
  - Target better-drained fields for corn/corn.
  - Tillage, if practical, to manage residue.
  - Row cleaners and proper operation of planter equipment more critical in no-till.
  - Avoid planting excessively early.
  - Response to starter more likely.
Summary

• Managing corn on corn ground takes a higher level of skill and provides more challenges.
  - Use hybrid selection and/or appropriate use of pesticides to manage pests.
  - Remember greater N needs of corn.
  - Avoid fields that tend to take longer to warm up in spring and don’t be in a hurry to plant.
  - Pay more attention to detail in operating planter.

QUESTIONS???