A Preliminary Look at Crop Rotation Patterns for Corn

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Source: Nebraska NASS Planted Acreage
Yellow = Corn : Green = Soybeans

Segment 1A – ‘X’ Corn & Soybean Alternate Each Year

‘O’ Non-Alternating Rotation
Segment 1B – ‘X’ Corn & Soybean Alternate Each Year

‘O’ Non-Alternating Rotation

Yellow = Corn : Green = Soybeans
Segment 1C – ‘X’ Corn & Soybean Alternate Each Year

‘O’ Non-Alternating Rotation

Yellow = Corn : Green = Soybeans
Source: Nebraska 2002-2007 NASS Cropland Data Layers

Change Period
Soybean -> Soybean
Corn -> Corn
Corn -> Soybean
Soybean -> Corn

<table>
<thead>
<tr>
<th>Change Period</th>
<th>Crop Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999 -&gt; 2000</td>
<td>Soybean -&gt; Soybean</td>
</tr>
<tr>
<td>2000 -&gt; 2001</td>
<td>Soybean -&gt; Soybean</td>
</tr>
<tr>
<td>2001 -&gt; 2002</td>
<td>Corn -&gt; Corn</td>
</tr>
<tr>
<td>2002 -&gt; 2003</td>
<td>Corn -&gt; Soybean</td>
</tr>
<tr>
<td>2003 -&gt; 2004</td>
<td>Soybean -&gt; Corn</td>
</tr>
<tr>
<td>2004 -&gt; 2005</td>
<td>Soybean -&gt; Soybean</td>
</tr>
<tr>
<td>2005 -&gt; 2006</td>
<td>Corn -&gt; Corn</td>
</tr>
<tr>
<td>2006 -&gt; 2007</td>
<td>Corn -&gt; Soybean</td>
</tr>
</tbody>
</table>

Crop Rotation Percentages:

- Soybean -> Soybean: 38.6%, 39.0%, 37.9%, 38.6%, 37.7%, 35.8%, 34.6%, 39.4%
- Corn -> Corn: 11.4%, 10.8%, 12.2%, 13.4%, 15.4%, 18.0%, 17.9%, 22.2%
- Corn -> Soybean: 10.4%, 10.8%, 10.8%, 12.2%, 13.4%, 15.4%, 17.9%, 18.0%
- Soybean -> Corn: 7.5%
Pocahontas County, Iowa
2001-2005

28.94% “12121”*
26.90% “21212”*
12.11% Cn(3)/Sb(2)
3.79% Cn(4)/Sb(1)
3.66% Cn(2)/Sb(3)
2.16% Other(5)

* Standard Rotations:
  12121 = C/S/C/S/C
  21212 = S/C/S/C/S
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* Standard Rotations:
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## Pixels in Pocahontas County, Iowa

<table>
<thead>
<tr>
<th>Number Times (Years) That:</th>
<th>Percent Overall (5 year period)</th>
<th>Percent Adjust. For Std. Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn &gt; Soyb</td>
<td>53.05</td>
<td>24.11</td>
</tr>
<tr>
<td>Corn = Soyb</td>
<td>5.12</td>
<td>60.95</td>
</tr>
<tr>
<td>Corn &lt; Soyb</td>
<td>37.24</td>
<td>10.35</td>
</tr>
<tr>
<td>Usually Other</td>
<td>4.59</td>
<td>4.59</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
## Percent of Total ‘Corn + Beans’ Acres Planted, Selected States

<table>
<thead>
<tr>
<th>State &amp; Year</th>
<th>Percent Corn</th>
<th>Percent Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nebraska ’01-’06</td>
<td>63.2</td>
<td>36.8</td>
</tr>
<tr>
<td>Nebraska ’07 pre.</td>
<td>67.2</td>
<td>32.8</td>
</tr>
<tr>
<td>Iowa ’01-’06</td>
<td>54.3</td>
<td>45.7</td>
</tr>
<tr>
<td>Iowa ’07 pre.</td>
<td>60.2</td>
<td>39.8</td>
</tr>
<tr>
<td>Illinois ’01-’06</td>
<td>52.8</td>
<td>47.2</td>
</tr>
<tr>
<td>Illinois ’07 pre.</td>
<td>59.7</td>
<td>40.3</td>
</tr>
<tr>
<td>Arkansas ’01-’06</td>
<td>7.9</td>
<td>92.1</td>
</tr>
<tr>
<td>Arkansas ’07 pre.</td>
<td>16.2</td>
<td>83.8</td>
</tr>
</tbody>
</table>
The Cropland Data Layer Inventory
1997-2006
Conclusions

• Although corn acreages increased significantly in 2007, corn/soybean rotation patterns for these 3 states don’t appear to be radically altered. This suggests acres coming from other land uses.

• Rotation patterns vary by state
  – Official estimates show state level patterns
    • Nebraska ~ 2:1, Iowa/Illinois ~ 1:1
    • Arkansas – little or no relationship to a corn/soybean rotation

• Probability of soybean to soybean rotation is half of that for corn to corn
Conclusions

• Cropland Data Layer
  – Limited corn/soybean coverage for prior years
  – Where CDL is available, exact rotations can be extracted for display/summary

• 243 (i.e., $3^5$) pattern combinations exist
  – Corn/Soybeans/Other covers over 5 years
  – All combinations have some number of pixels