Quality of the United States Commodity and Food Soybean Crop: 2010

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2010 Soybean Growing Season

- Planting conditions were very good to excellent in most areas of the US
- Spring and summer temperature and rainfall tended to be greater than normal across the Midwest
- Southern states were greatly affected by drought and high temperatures throughout the summer
- Drought conditions extended into the SE Cornbelt (Indiana and Ohio) in late August and through September
U.S. Drought Monitor

July 27, 2010
Valid 8 a.m. EDT

Intensity:
- Yellow: D0 Abnormally Dry
- Light Yellow: D1 Drought - Moderate
- Orange: D2 Drought - Severe
- Dark Orange: D3 Drought - Extreme
- Red: D4 Drought - Exceptional

Drought Impact Types:
- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Released Thursday, July 29, 2010
Author: David Miskus, CPC/NCEP/NWS/NOAA
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Released Thursday, September 30, 2010
Author: Richard Heim/Liz Love-Brotak, NOAA/NESDIS/NCDC
2010 Harvest

- Heavy rains fell across some Northern states in late September
- In general, October tended to be significantly dryer than normal. This allowed harvest to proceed at a record pace. By October 31, 2010, 96% of the US soybean crop had been harvested.
2010: Soybean pest summary

The common soybean insect pest **soybean aphid** (*Aphis glycines*) caused relatively little damage to the 2010 US crop because of above normal temperatures and abundant rainfall in the Midwest.
2010: Soybean pest summary

The much discussed soybean disease, soybean rust (*Phakopsora pachyrhizi*), was confined to small areas in extreme southern ranges of the US due to dry conditions during the second half of the growing season throughout the south.
Soybean rust 
(caused by *Phakopsora pachyrhizi*)

Soybean rust on leaves

Lesions with rust pustules
2010: Soybean pest summary

- The fungal disease **Sudden Death Syndrome (SDS)** (*Fusarium virguliforme*) heavily infected fields throughout the Midwest, due to warmer and wetter conditions there.
2010 Survey Methods

• In late August, sample kits were mailed to 9,325 US soybean producers, based on soybean production by state
• By October 25, 1850 samples were returned for analysis
2010 Survey Methods: Protein and Oil

- Samples were analyzed for protein and oil concentration by Near Infrared Spectroscopy (NIRS) using a Perten diode array instrument.
- Average protein and oil values were determined by state.
- Regional and US average values were determined by weighting averages based on estimated 2010 production.
Methods:
Seed size and FM

- **Seed size** was determined by counting and weighing 1000 seeds from each sample
  - Seed size is expressed on a grams per 100 seeds basis
- **FM** was hand picked and expressed as a % of total sample weight
- Split soybeans are not counted as FM
Methods: Foreign Material
## Results: Protein and Oil

<table>
<thead>
<tr>
<th>Year or Region</th>
<th>Protein (%) (13% basis)</th>
<th>Oil (%) (13% basis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>34.9</td>
<td>18.7</td>
</tr>
<tr>
<td>1986-2010</td>
<td>35.3</td>
<td>18.7</td>
</tr>
<tr>
<td>Western Corn Belt</td>
<td>34.5</td>
<td>18.6</td>
</tr>
<tr>
<td>Eastern Corn Belt</td>
<td>35.2</td>
<td>18.7</td>
</tr>
<tr>
<td>Midsouth</td>
<td>35.5</td>
<td>18.8</td>
</tr>
<tr>
<td>Southeast</td>
<td>35.6</td>
<td>19.5</td>
</tr>
<tr>
<td>East Coast</td>
<td>35.8</td>
<td>18.6</td>
</tr>
</tbody>
</table>
Results: Seed size

Seed size was smaller in 2010 than in 2009

- 14.3 g/100 seeds in 2010
- 16.0 g/100 seeds in 2009
Results: Foreign material (FM)

- Foreign material (FM) averaged 0.4% across all samples
  - 94% (1741) of samples had FM below 1%
  - 98% (1818) of samples had FM below 2%
Summary

- The US will produce a record crop due to good to excellent weather throughout the major soybean production regions.
- The quality of the US crop appears to be very similar to that of the 2009 crop and the long term average.
- Seed size is slightly smaller than in 2009.
- Despite a few samples with very high FM, average FM remains very small (0.4%) at the farm level.
2010 Food Soybean Survey
Food soybean companies throughout the US were supplied with sample kits in August. By 27 October, 294 samples were returned for analysis.
2010 Food Soybean Survey

Samples were grouped by region:

- 176 samples from Northern states, 100 samples from Central states, and 18 samples from Southern states

and seed size:

- 26 small seed size samples (≤ 13 g/100 seeds), 231 average (13.1 – 21 g/100 seeds), and 37 large (> 21 g/100 seeds)
2010 Food Soybean Survey
<table>
<thead>
<tr>
<th>State (number of samples)</th>
<th>Protein Average* (%</th>
<th>Regional Protein Average</th>
<th>Oil Average* (%)</th>
<th>Regional Oil Average</th>
<th>Fiber Average† (%)</th>
<th>Regional Fiber Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan (94)</td>
<td>36.1</td>
<td>Northern</td>
<td>18.1</td>
<td>Northern</td>
<td>5.5</td>
<td>Northern</td>
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<tr>
<td>Minnesota (33)</td>
<td>37.1</td>
<td>‡</td>
<td>17.4</td>
<td>‡</td>
<td>5.6</td>
<td>‡</td>
</tr>
<tr>
<td>North Dakota (22)</td>
<td>35.6</td>
<td>‡</td>
<td>17.2</td>
<td>‡</td>
<td>5.9</td>
<td>‡</td>
</tr>
<tr>
<td>South Dakota (3)</td>
<td>33.4</td>
<td>‡</td>
<td>18.2</td>
<td>‡</td>
<td>5.7</td>
<td>‡</td>
</tr>
<tr>
<td>Wisconsin (24)</td>
<td>37.0</td>
<td>36.3</td>
<td>18.4</td>
<td>17.9</td>
<td>5.8</td>
<td>5.6</td>
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<tr>
<td>Iowa (53)</td>
<td>37.7</td>
<td>Central</td>
<td>17.4</td>
<td>Central</td>
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</tr>
<tr>
<td>Illinois (20)</td>
<td>37.3</td>
<td>‡</td>
<td>18.1</td>
<td>‡</td>
<td>5.9</td>
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</tr>
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<td>Ohio (27)</td>
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<td></td>
<td>36.6</td>
<td>18.1</td>
<td>6.0</td>
<td></td>
<td>6.0</td>
</tr>
</tbody>
</table>

Data as of October 27, 2010

‡ Northern region = Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin; Central region = Iowa, Illinois, and Ohio; Southern region = Missouri

* 13% moisture basis; † Percent dry matter basis
<table>
<thead>
<tr>
<th>Region</th>
<th>Seed Size</th>
<th>Number Samples</th>
<th>Seed Size Average (g/100 seeds)</th>
<th>Protein Average* (%)</th>
<th>Oil Average* (%)</th>
<th>Fiber Average†</th>
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</thead>
<tbody>
<tr>
<td>Northern</td>
<td>Small</td>
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<td>9.2</td>
<td>34.2</td>
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<tr>
<td></td>
<td>Average</td>
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<td>17.4</td>
<td>36.3</td>
<td>18.1</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Large</td>
<td>24</td>
<td>22.5</td>
<td>38.2</td>
<td>17.3</td>
<td>5.4</td>
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<tr>
<td>Central</td>
<td>Small</td>
<td>7</td>
<td>12.3</td>
<td>36.9</td>
<td>17.9</td>
<td>5.9</td>
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<tr>
<td></td>
<td>Average</td>
<td>80</td>
<td>16.1</td>
<td>37.7</td>
<td>17.7</td>
<td>5.8</td>
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<td></td>
<td>Large</td>
<td>13</td>
<td>24.0</td>
<td>38.2</td>
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<tr>
<td>Southern</td>
<td>Small</td>
<td>1</td>
<td>12.6</td>
<td>37.3</td>
<td>16.1</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>17</td>
<td>15.1</td>
<td>36.5</td>
<td>18.2</td>
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<tr>
<td></td>
<td>Large</td>
<td>0</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Data as of October 27, 2010

§ Small seed: ≤13.0 g/100 seeds; Average: 13.1-21.0 g/100 seeds; Large: >21 g/100 seeds (unofficial categories)
‡ Northern region = Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin; Central region = Iowa, Illinois, and Ohio; Southern region = Missouri
* 13% moisture basis; † Percent dry matter basis
As expected, large seed size samples tended to have higher protein levels than average and small soybean samples.

Within the small and average seed size categories, Northern samples had lower protein than those from Central and Southern states.
2010 Food Soybean Survey

- Within the Northern and Central regions, small-seeded samples were higher in fiber than larger seed size samples.

- On a state-by-state basis: food grade soybeans were higher in protein and lower in oil than commodity soybeans.
Thank You!

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