Mission
- Developing markets, enabling trade, improving lives

Reports
- Help buyers make better informed decisions
- Increase confidence in the capacity and reliability of the market
- Assist nations around the world in achieving food security through trade
Committed to global food security and mutual economic benefit through trade

- Excellence in Exports
- Growing the value of trade
- Promoting food security and economic growth
- Adding valuable expertise
- Nurturing reliable trade policies
Motivation

- Lack of information on quality of U.S. sorghum
- Growth of U.S. sorghum exports
- Success of USGC Corn Quality Reports

Objective

- To provide information proactively on the U.S. sorghum crop to international buyers
  - Harvest
  - Early exports
The geographic areas included in the Harvest sampling area include the highest sorghum-producing regions in the United States. This map represents projected 2015 sorghum production by USDA Agricultural Statistical District (ASD) and was used to allocate the 2015 sampling.

Source: USDA NASS and Centrec Estimates
Early Harvest Quality Report

Initial look at crop quality from early harvest areas

50 samples collected during August and September
Harvest and Export Cargo Report

Harvest
U.S. Aggregate
Plus
Two Harvest Areas

Export Cargo
U.S. Aggregate
Plus
Two Export Outlets

Quality across key production areas

207 samples
Late Harvest

182 samples
Texas
NOLA

Export quality early in marketing year

207 samples
Late Harvest

182 samples
Texas
NOLA

Quality across key production areas
USGC Quality Sampling

Harvest Sampling

- Initial levels and variability of quality characteristics across the diverse geographic regions
- Inbound, unblended commodity samples from local elevators
USGC Quality Sampling

- Initial levels and variability of early export quality at ports
- Commodity sorghum samples collected by USDA at key export outlets
Quality Factors Tested

**Grading Factors**
- Test weight
- Broken kernel/foreign material
- Foreign material
- Total damage/Heat damage

**Physical Factors**
- Kernel diameter
- 1000-kernel weight
- Kernel volume
- True density
- Kernel hardness index

**Moisture**

**Chemical Composition**
- Protein
- Starch
- Oil
- Tannins

**Mycotoxins**
- Aflatoxins
- DON
Delayed early season planting progress

Slowed vegetative development and increased nutrient losses

Hastened crop maturity; harvest progress was later than normal due to the crop’s delayed start
Meeting Title in Arial

12

Delayed planting

progress

Abundant rains

Planting

Conditions changed from very
wet to dry

Late Harvest Area

May

September and October

Warm and dry

Abundant rains

Heading

Shortened the grain fill period and accelerated maturity

Despite the crop's delayed planting, harvest progress comparable to 5YA

Harvest

U.S. GRAINS COUNCIL
Harvest 2015 Highlights

Grade Factors
- Average for all factors exceeded criteria for U.S. No. 1 grade

Chemical Composition
- Typical protein, starch, and oil concentrations compared to previous research
- All samples were considered tannin-free

Moisture
- Moisture recorded at the elevator averaged 14.1%

Physical Factors
- On average, U.S. Harvest Aggregate had less volume than typical for kernels from any sorghum crop
- Typical kernel diameter, weight, true density and hardness for any commercial sorghum hybrid sample
Aflatoxins
  - 100% of the samples tested below the FDA action level

DON
  - All samples tested below the FDA advisory level
Grade Factors and Moisture
### Grades and Grade Requirements

<table>
<thead>
<tr>
<th>Grade</th>
<th>Min. Test Weight per Bushel (Pounds)</th>
<th>Heat Damaged (%)</th>
<th>Total Damage (%)</th>
<th>Foreign Material (part of total) (%)</th>
<th>Broken Kernel and Foreign Material (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. No. 1</td>
<td>57.0</td>
<td>0.2</td>
<td>2.0</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>U.S. No. 2</td>
<td>55.0</td>
<td>0.5</td>
<td>5.0</td>
<td>2.0</td>
<td>6.0</td>
</tr>
<tr>
<td>U.S. No. 3</td>
<td>53.0</td>
<td>1.0</td>
<td>10.0</td>
<td>3.0</td>
<td>8.0</td>
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<tr>
<td>U.S. No. 4</td>
<td>51.0</td>
<td>3.0</td>
<td>15.0</td>
<td>4.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Source: USDA Federal Grain Inspection Service (FGIS)
## Grade Factors and Moisture

<table>
<thead>
<tr>
<th></th>
<th>No. of Samples</th>
<th>Avg.</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Weight (lb/bu)</td>
<td>207</td>
<td>58.9</td>
<td>1.68</td>
<td>46.1</td>
<td>62.5</td>
</tr>
<tr>
<td>Test Weight (kg/hl)</td>
<td>207</td>
<td>75.9</td>
<td>2.16</td>
<td>59.3</td>
<td>80.4</td>
</tr>
<tr>
<td>BNFM (%)</td>
<td>207</td>
<td>1.7</td>
<td>0.93</td>
<td>0.0</td>
<td>6.7</td>
</tr>
<tr>
<td>Foreign Material (%)</td>
<td>207</td>
<td>0.6</td>
<td>0.41</td>
<td>0.0</td>
<td>4.8</td>
</tr>
<tr>
<td>Total Damage (%)</td>
<td>207</td>
<td>0.1</td>
<td>0.13</td>
<td>0.0</td>
<td>5.7</td>
</tr>
<tr>
<td>Heat Damage (%)</td>
<td>207</td>
<td>0.0</td>
<td>0.00</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Moisture (%)</td>
<td>207</td>
<td>14.1</td>
<td>1.19</td>
<td>10.1</td>
<td>17.9</td>
</tr>
</tbody>
</table>
Test Weight – U.S. Units

U.S. Aggregate: 58.9 lb/bu

- Average above the minimum for U.S. No. 1 grade
- 97% of the samples at or above the limit for U.S. No. 2 grade
- Late Harvest average slightly higher than Early Harvest average

<table>
<thead>
<tr>
<th>Year</th>
<th>Avg (lb/bu)</th>
<th>Std Dev (lb/bu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>58.9</td>
<td>1.68</td>
</tr>
</tbody>
</table>

Percent of Samples (%)

- <53: 1.4%
- 53-54.9: 1.4%
- 55-56.9: 12.6%
- 57-58.9: 24.6%
- 59-60.9: 43.0%
- ≥61: 16.9%
Test Weight - Metric

U.S. Aggregate: 75.9 kg/hl

- Average above the minimum for U.S. No. 1 grade
- 97% of the samples at or above the limit for U.S. No. 2 grade
- Late Harvest average slightly higher than Early Harvest average
U.S. Aggregate: 1.7%

- Average well below the maximum for U.S. No. 1 grade
- 99% were below the maximum for U.S. No. 2 grade
- Early Harvest average lower than Late Harvest average
Foreign Material (%)

U.S. Aggregate: 0.6%
- Average below the maximum for U.S. No. 1 grade
- 98% contained less than the maximum allowable for U.S. No. 2 grade
- Early Harvest average slightly lower than Late Harvest average
Total Damage

U.S. Aggregate: 0.1%

- Average well below the maximum for U.S. No. 1 grade
- 99.5% had less than the maximum allowable for U.S. No. 2 grade
- No damage in Late Harvest samples
Heat Damage: Zero

- None observed at harvest
- The absence of heat damage likely was due, in part, to recently-harvested samples coming directly from farm to elevator with minimal prior drying
Moisture (%)

Not a grade factor
U.S. Aggregate: 14.1%

- 48% of the samples exceeded 14% moisture
- Drying may have been needed for part of the Harvest crop
- Late Harvest average slightly less than Early Harvest average

<table>
<thead>
<tr>
<th>Moisture (%)</th>
<th>Harvest Area Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>14.5</td>
</tr>
<tr>
<td>Late</td>
<td>14.0</td>
</tr>
</tbody>
</table>

### U.S. Aggregate: 14.1%

- 48% of the samples exceeded 14% moisture
- Drying may have been needed for part of the Harvest crop
- Late Harvest average slightly less than Early Harvest average
Sorghum Chemical Composition

**Protein**
- Important for poultry and livestock feeding
- Supplies essential amino acids

**Starch**
- Important source of metabolizable energy and substrates

**Oil**
- Supplies energy and fatty acids
- Important co-product of value-added processing

Influenced by genetics, crop yields, weather and available nitrogen during the growing season.

Influenced by genetics, weather and crop yields.
Chemical Composition Factors

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>No. of Samples</th>
<th>Avg.</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein (Dry Basis %)</td>
<td>207</td>
<td>10.9</td>
<td>1.02</td>
<td>6.8</td>
<td>14.1</td>
</tr>
<tr>
<td>Starch (Dry Basis %)</td>
<td>207</td>
<td>73.2</td>
<td>0.80</td>
<td>68.7</td>
<td>75.6</td>
</tr>
<tr>
<td>Oil (Dry Basis %)</td>
<td>207</td>
<td>4.5</td>
<td>0.27</td>
<td>3.0</td>
<td>5.1</td>
</tr>
</tbody>
</table>
Protein (Dry basis %)

U.S. Aggregate: 10.9%

- In the range of typical protein concentration values for U.S. sorghum
- Late Harvest average greater than Early Harvest average
Starch (Dry basis %)

U.S. Aggregate: 73.2%

- Typical level for any sorghum crop
- Late Harvest range (68.7 to 75.6%) greater than Early Harvest range (71.1 to 75.0%)
Oil (Dry basis %)

U.S. Aggregate: 4.5%
- In the range of typical oil concentration values for U.S. sorghum
- Late Harvest average greater than Early Harvest average
Quantitative test (levels to indicate presence of tannins) was used instead of qualitative test (Yes or No) for more accurate results.

- Values near or below 4.0 mg catechin equivalents (CE) per one g sample by this method generally imply absence of condensed tannins.¹,²
- Type III tannin sorghums usually have values greater than 8.0 mg CE/g.

Tannins (mg CE/g)

- 100% of all harvest sorghum samples were below the threshold of 4.0 mg CE/g
- All samples were considered tannin-free
Physical Factors
Physical Factors – Overview

Related to processing characteristics, storability and potential for breakage

- Kernel weight, volume and density
- Kernel diameter
- Kernel hardness index
<table>
<thead>
<tr>
<th>Physical Factors</th>
<th>No. of Samples</th>
<th>Avg.</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel Diameter (mm)</td>
<td>207</td>
<td>2.53</td>
<td>0.09</td>
<td>2.18</td>
<td>2.90</td>
</tr>
<tr>
<td>TKW (g)</td>
<td>207</td>
<td>26.30</td>
<td>2.00</td>
<td>19.49</td>
<td>34.66</td>
</tr>
<tr>
<td>Kernel Volume (mm$^3$)</td>
<td>207</td>
<td>19.34</td>
<td>1.44</td>
<td>14.31</td>
<td>25.40</td>
</tr>
<tr>
<td>True Density (g/cm$^3$)</td>
<td>207</td>
<td>1.359</td>
<td>0.013</td>
<td>1.295</td>
<td>1.402</td>
</tr>
<tr>
<td>Kernel Hardness Index</td>
<td>207</td>
<td>71.0</td>
<td>6.2</td>
<td>37.1</td>
<td>91.5</td>
</tr>
</tbody>
</table>
Kernel Weight, Volume, Density

- Measure the size and composition of sorghum kernels
- Kernel volume is indicative of growing conditions and genetics

\[
\frac{1000-\text{Kernel Weight} \ (\text{TKW}) \ (\text{mass}) \ (g)}{\text{Kernel Volume} \ (\text{mm}^3) \times \frac{1 \ \text{cm}^3}{1000 \ \text{mm}^3}} = \text{True Density} \ (g/cm^3)
\]

- True density reflects kernel hardness
- Higher density – harder kernels; less susceptible to breakage
- Lower density – softer kernels; process well in size reduction; good for feed use
1000-kernel Weight (TKW) (g)

U.S. Aggregate: 26.30 g

- Within the range of typical levels for U.S. sorghum
- Late Harvest average slightly higher than Early Harvest average
Kernel Volume (mm$^3$)

U.S. Aggregate: 19.34 mm$^3$

- On the lower end for kernels from a typical sorghum crop
- Late Harvest average slightly higher than Early Harvest average

### Harvest Area Average

<table>
<thead>
<tr>
<th>Harvest Area</th>
<th>Average (mm$^3$)</th>
<th>Std Dev (mm$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>19.22</td>
<td>5.3</td>
</tr>
<tr>
<td>Late</td>
<td>19.40</td>
<td>7.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Average</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>19.34</td>
<td>1.44</td>
</tr>
</tbody>
</table>
Kernel True Density (g/cm$^3$)

U.S. Aggregate: 1.359 g/cm$^3$

- Within the typical range of values for kernels from a typical sorghum crop
- 71% were between 1.345 and 1.374 g/cm$^3$
- Late Harvest average slightly greater than Early Harvest average
Other Physical Properties

Kernel Diameter
- Directly correlated with kernel volume
- Impacts size reduction behavior and material handling practices
- May indicate maturity of kernel

Kernel Hardness Index
- The higher the value, the harder the kernel
- Impacts end-use of sorghum
Kernel Diameter (mm)

U.S. Aggregate: 2.53 mm

- Typical values for kernels from any sorghum crop
- 53\% were between 2.5 and 2.69 mm
- Late Harvest average about the same as Early Harvest average
Kernel Hardness Index (KHI)

U.S. Aggregate: 71.0

- Average value typical for any sorghum crop
- Almost 80% ranged from 60 to 79.99
- Slightly higher Late Harvest average than Early Harvest average
Mycotoxins: Aflatoxins and DON
Mycotoxin Testing

Sorghum harvest sampling

- Shows ONLY the frequency of detection in harvest samples
- Does NOT predict the presence or levels of mycotoxins in U.S. sorghum exports

Tested a minimum of 25% of collected samples

Positive results if above FGIS’s “Lower Conformance Limit”

- Aflatoxins: 5.0 ppb
- DON: 0.5 ppm
Aflatoxins Testing Results

- 100% had no detectable levels (≤5 ppb) of aflatoxins
- All samples below the FDA action level of 20 ppb
- Growing season conditions were not conducive to aflatoxin development
DON Testing Results

- 100% had no detectable levels (≤0.5 ppm) of DON
- All samples below the FDA advisory level of 5 ppm
- Growing season conditions were not conducive to DON development
Harvest Quality Conclusions
2015 harvest samples were, on average, very good with 94% grading U.S. No. 2 or better
- Average moisture at near optimum level for harvest moisture
- Average composition within the range of reported concentration values for U.S. sorghum hybrids
- Sorghum harvest samples were tannin-free
- Kernel diameter, hardness, weight and true density typical for kernels from any sorghum crop
- Growing season was not conducive to aflatoxin and DON development
Other Features of the Sorghum Harvest & Export Cargo Quality Report
Other Features of the Report

- Export Quality Test Results
- Crop and Weather Conditions
- U.S. Sorghum Export System
- U.S. Sorghum Production, Usage and Outlook
- Survey and Statistical Analysis Methods
- Testing Analysis Methods
### Tool for Better Decision Making

<table>
<thead>
<tr>
<th>Sorghum Quality</th>
<th>Harvest – impacted by several factors including geography, genetics and weather</th>
<th>Export – affected by many factors in the U.S. grain marketing system, in addition to building on the quality established at harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Understanding Quality</strong></td>
<td>Provides information for evaluating patterns in quality across geographies, how weather affects quality, and changes in quality between harvest and export</td>
<td></td>
</tr>
<tr>
<td><strong>Report Value</strong></td>
<td>Each year of these reports increases their value; several years of results using the same survey and testing methodology can be compared; patterns in quality and factors that influence quality will surface</td>
<td></td>
</tr>
</tbody>
</table>
Building a Tradition: Thank You!

Developing markets. >> Enabling trade. >> Improving lives.
SUPPLEMENTAL SLIDES:
U.G. Grains Council
2015/2016 Sorghum Harvest Quality
U.S. Sorghum Production Supply & Demand Outlook
U.S. Sorghum Production and Yield

<table>
<thead>
<tr>
<th>Year</th>
<th>Hectares Harvested (mil)</th>
<th>Yield (mt/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>2015p</td>
<td>3.1</td>
<td></td>
</tr>
</tbody>
</table>

Source: USDA NASS  P=Projected
U.S. Sorghum Production

<table>
<thead>
<tr>
<th>Marketing Year</th>
<th>Million Metric Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/12</td>
<td>5</td>
</tr>
<tr>
<td>12/13</td>
<td>6</td>
</tr>
<tr>
<td>13/14</td>
<td>10</td>
</tr>
<tr>
<td>14/15</td>
<td>11</td>
</tr>
<tr>
<td>15/16P</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: USDA NASS  P=Projected
U.S. Sorghum Production by State

Sampled States

<table>
<thead>
<tr>
<th>State</th>
<th>2014</th>
<th>2015P</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR</td>
<td>1.09</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>KS</td>
<td>7.04</td>
<td></td>
</tr>
<tr>
<td>LA</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>MO</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>NE</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>OK</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>TX</td>
<td>3.96</td>
<td></td>
</tr>
</tbody>
</table>

Crop Year
- 2014
- 2015P

Source: USDA NASS  P=Projected
U.S. Sorghum Production and Disappearance

**Production**

- **11/12**: 5.0
- **12/13**: 5.5
- **13/14**: 7.0
- **14/15**: 10.0
- **15/16P**: 15.0

**Total Domestic Use**

- **11/12**: 2.0
- **12/13**: 2.5
- **13/14**: 3.0
- **14/15**: 6.0
- **15/16P**: 15.0

**Exports**

- **11/12**: 1.0
- **12/13**: 2.0
- **13/14**: 3.0
- **14/15**: 8.0
- **15/16P**: 1.0

**Ending Stocks**

- **11/12**: 0.5
- **12/13**: 1.0
- **13/14**: 1.5
- **14/15**: 8.0
- **15/16P**: 1.0

Source: USDA NASS  
P=Projected
U.S. Sorghum Domestic Sorghum Use

**Marketing Year**
- 11/12
- 12/13
- 13/14
- 14/15
- 15/16P

<table>
<thead>
<tr>
<th></th>
<th>Feed and Residual</th>
<th>Food Seed and Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Million Metric Tons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/12</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>12/13</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>13/14</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>14/15</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>15/16P</td>
<td>4.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: USDA NASS  P=Projected
# U.S. Sorghum Supply and Usage Summary

<table>
<thead>
<tr>
<th></th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
<th>15/16P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acreage (million hectares)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planted</td>
<td>2.2</td>
<td>2.5</td>
<td>3.3</td>
<td>2.9</td>
<td>3.5</td>
</tr>
<tr>
<td>Harvested</td>
<td>1.6</td>
<td>2.0</td>
<td>2.7</td>
<td>2.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Yield (metric ton/hectare)</td>
<td>3.4</td>
<td>3.1</td>
<td>3.7</td>
<td>4.2</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Supply (million metric tons)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning Stocks</td>
<td>0.7</td>
<td>0.6</td>
<td>0.4</td>
<td>0.9</td>
<td>0.5</td>
</tr>
<tr>
<td>Production</td>
<td>5.4</td>
<td>6.3</td>
<td>10.0</td>
<td>11.0</td>
<td>15.1</td>
</tr>
<tr>
<td>Imports</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total Supply</strong></td>
<td>6.1</td>
<td>7.1</td>
<td>10.4</td>
<td>11.9</td>
<td>15.6</td>
</tr>
<tr>
<td><strong>Usage (million metric tons)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food, seed, and industrial use</td>
<td>2.2</td>
<td>2.4</td>
<td>1.8</td>
<td>0.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Feed and residual use</td>
<td>1.8</td>
<td>2.4</td>
<td>2.4</td>
<td>2.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Exports</td>
<td>1.6</td>
<td>1.9</td>
<td>5.4</td>
<td>9.0</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Total Use</strong></td>
<td>5.5</td>
<td>6.7</td>
<td>9.5</td>
<td>11.4</td>
<td>14.1</td>
</tr>
<tr>
<td>Ending Stocks</td>
<td>0.6</td>
<td>0.4</td>
<td>0.9</td>
<td>0.5</td>
<td>1.5</td>
</tr>
<tr>
<td><em><em>Avg farm price ($/mt</em>)</em>*</td>
<td>235.89</td>
<td>249.12</td>
<td>168.43</td>
<td>158.73</td>
<td>125.98-149.60</td>
</tr>
</tbody>
</table>

P-Projected

* Farm prices are weighted averages based on volume of farm shipment

Source: USDA WASDE

Average farm price for 15/16P based on WASDE December projected price

December 2015
# U.S. Sorghum Supply and Usage Summary

<table>
<thead>
<tr>
<th>acreage (million acres)</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
<th>15/16P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planted</td>
<td>5.5</td>
<td>6.3</td>
<td>8.1</td>
<td>7.1</td>
<td>8.7</td>
</tr>
<tr>
<td>Harvested</td>
<td>3.9</td>
<td>5.0</td>
<td>6.6</td>
<td>6.4</td>
<td>7.6</td>
</tr>
<tr>
<td>Yield (bushels/acre)</td>
<td>54.0</td>
<td>49.6</td>
<td>59.6</td>
<td>67.6</td>
<td>77.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply (million bushels)</th>
<th>In Millions of Bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Stocks</td>
<td>27 23 15 34 18</td>
</tr>
<tr>
<td>Production</td>
<td>213 248 392 433 594</td>
</tr>
<tr>
<td>Imports</td>
<td>0     10    0     0    2</td>
</tr>
<tr>
<td>Total Supply</td>
<td>241  280  408  467  614</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage (million bushels)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food, seed, and industrial use</td>
<td>85 95 70 15 100</td>
</tr>
<tr>
<td>Feed and residual use</td>
<td>69 93 93 80 130</td>
</tr>
<tr>
<td>Exports</td>
<td>63 76 211 353 325</td>
</tr>
<tr>
<td>Total Use</td>
<td>218 265 374 449 555</td>
</tr>
<tr>
<td>Ending Stocks</td>
<td>23 15 34 18 59</td>
</tr>
<tr>
<td>Avg farm price ($/bushel**)</td>
<td>5.99 6.33 4.28 4.03 3.20-3.80</td>
</tr>
</tbody>
</table>

P-Projected
* Farm prices are weighted averages based on volume of farm shipment

Average farm price for 15/16P based on WASDE December projected price

Source: USDA WASDE

December 2015