Grain Market Outlook: Market Snapshots and Potential Risks

November 15, 2022

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Price Related Index

Price Trends: Seasonality & Volatility

- Strong prices for both corn and soybeans
- Margin squeeze risk still exists

Corn and Soybean Prices through Nov. 4 (Toledo, OH)

Est. cost: $12/bu (Soybean)
Est. cost: $5.74/bu (Corn)

Source: USDA-AMS, USDA-NASS, and Farm Office (OSU Extension)
## Price Related Index

### Futures Prices

#### Corn Futures Price

- **$ per bushel**
- **Cash**
- **Contract**
- **December 22**
- **March 23**
- **May 23**
- **July 23**
- **September 23**
- **December 23**
- **March 24**
- **May 24**
- **July 24**
- **September 24**
- **December 24**
- **March 25**
- **May 25**
- **July 25**
- **September 25**

**Price:** 6.51

#### Soybean Futures Price

- **$ per bushel**
- **Cash**
- **Contract**
- **November 22**
- **January 23**
- **March 23**
- **May 23**
- **July 23**
- **September 23**
- **November 23**
- **January 24**
- **March 24**
- **May 24**
- **July 24**
- **September 24**
- **November 24**
- **January 25**
- **March 25**
- **May 25**
- **July 25**
- **September 25**

**Price:** 14.39

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Source: Chicago Board of Trade (CBOT), 11/09/2022 (Barchart.com)
Exceptional volatility in basis is observed both in corn and soybean.
Corn’s negative basis during the first half of this year was remarkable (followed by War in Ukraine).
Price Related Index

Basis

Corn Local Basis

- Weak corn basis in Ohio

Soybean Local Basis

- Relatively strong soybean basis in Ohio

Source: DTN Market Tracker, 11/10/2022
• 87% of corn acreage is harvested (Nov 6, 2022)
• Yield estimate for this year is 172.3 bu/acre
• Yield rate is below the trend (increase by 1.9 bu/acre/year)
• Total production is projected to be 13.9 billion bushels
Supply Side

State-level Corn Yield

Changes in Ohio Trend Adjusted Yields (bu/acre)

Ohio corn production

- Currently, 75% of Ohio corn grain is harvested (Nov 6, 2022)
- 3.6% down from last year but still 7.4 bushels per acre above the trend (186 bu/acre)

Top: 2022 yield estimate
Bottom: % change from previous year

Source: USDA-NASS, November 9, 2022
94% of soybean acreage is harvested (Nov 6)

Yield estimate for this year is 50.2 bu/acre

Second time below the trend line for the last 9 years (trend coefficient: increase by 0.52 bu/acre/year)

Total production is projected to be 4.3 billion bushels

Changes in U.S. Trend Adjusted Yields (bu/acre)

Source: USDA-NASS
Supply Side

State-level Soybean Yield

Ohio soybean production

• Currently, 92% of Ohio soybean acreage is harvested (Nov 6, 2022)
• 3.5% down from last year but still 1.1 bushels per acre above the trend (55 bu/acre)

Source: USDA-NASS, November 9, 2022
### U.S. Corn Supply and Use

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Planted (mil. acres)</td>
<td>88.9</td>
<td>89.7</td>
<td>90.7</td>
<td>93.3</td>
<td>88.6</td>
<td>-5%</td>
</tr>
<tr>
<td>Yield (bu./acre)</td>
<td>176.4</td>
<td>167.5</td>
<td>171.4</td>
<td>176.7</td>
<td>172.3</td>
<td>-2%</td>
</tr>
<tr>
<td>Production (mil. bu.)</td>
<td>14,340</td>
<td>13,620</td>
<td>14,111</td>
<td>15,074</td>
<td>13,930</td>
<td>-8%</td>
</tr>
<tr>
<td>Beg. Stocks (mil. bu.)</td>
<td>2,140</td>
<td>2,221</td>
<td>1,919</td>
<td>1,235</td>
<td>1,377</td>
<td>11%</td>
</tr>
<tr>
<td>Imports (mil. bu.)</td>
<td>28</td>
<td>42</td>
<td>24</td>
<td>24</td>
<td>50</td>
<td>108%</td>
</tr>
<tr>
<td><strong>Total Supply</strong> (mil. bu.)</td>
<td>16,509</td>
<td>15,883</td>
<td>16,055</td>
<td>16,333</td>
<td>15,357</td>
<td>-6%</td>
</tr>
<tr>
<td>Feed &amp; Residual (mil. bu.)</td>
<td>5,429</td>
<td>5,897</td>
<td>5,597</td>
<td>5,715</td>
<td>5,300</td>
<td>-7%</td>
</tr>
<tr>
<td>Ethanol (mil. bu.)</td>
<td>5,378</td>
<td>4,857</td>
<td>5,032</td>
<td>5,328</td>
<td>5,275</td>
<td>-1%</td>
</tr>
<tr>
<td>Food, Seed, &amp; Other (mil. bu.)</td>
<td>1,425</td>
<td>1,430</td>
<td>1,437</td>
<td>1,442</td>
<td>1,450</td>
<td>1%</td>
</tr>
<tr>
<td>Exports (mil. bu.)</td>
<td>2,066</td>
<td>1,778</td>
<td>2,753</td>
<td>2,471</td>
<td>2,150</td>
<td>-13%</td>
</tr>
<tr>
<td><strong>Total Use</strong> (mil. bu.)</td>
<td>14,288</td>
<td>13,963</td>
<td>14,819</td>
<td>14,956</td>
<td>14,175</td>
<td>-5%</td>
</tr>
<tr>
<td>Ending Stocks (mil. bu.)</td>
<td>2,221</td>
<td>1,919</td>
<td>1,236</td>
<td>1,377</td>
<td>1,182</td>
<td>-14%</td>
</tr>
<tr>
<td>Season-Average Price ($/bu.)</td>
<td>3.61</td>
<td>3.56</td>
<td>4.53</td>
<td>6.00</td>
<td>6.80</td>
<td>13%</td>
</tr>
</tbody>
</table>

Source: USDA-WAOB
U.S. Corn Supply and Use

Conceptual Summary

Price

Quantity

Current Predict Price-22/23

Low demand Price-22/23

S-22/23

S-21/22

Current predict D-22/23

Low demand case D-22/23

Price-21/22

D-21/22
• Total feed and residual use is expected 7% smaller than 2021/22

• Feed and residual demand is projected to be relatively low, which is mainly due to the possibility of economic downturn (economic stress → low protein consumption → feed demand ↓)

• My prediction for the first quarter (Sep-Nov) feed demand is 2,306 million bushels, which is 10% down from the first quarter of 21/22
• Relatively high gasoline and renewable identification number (RIN) prices support relatively stable corn demand for ethanol production (2022/23 forecast: 1% down from 2021/22)

Final Volume Requirements for 2020-2022 (Bil. Gal)

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulosic Biofuel</td>
<td>0.51</td>
<td>0.56</td>
<td>0.63</td>
</tr>
<tr>
<td>Biomass-Based Diesel</td>
<td>2.43**</td>
<td>2.43**</td>
<td>2.76</td>
</tr>
<tr>
<td>Advanced Biofuel</td>
<td>4.63</td>
<td>5.05</td>
<td>5.63</td>
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<tr>
<td>Total Renewable Fuel</td>
<td>17.13</td>
<td>18.84</td>
<td>20.63</td>
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<tr>
<td>Supplemental Standard</td>
<td>n/a</td>
<td>n/a</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Source: U.S. Energy Information Administration data
Demand Side
Corn Export Volume

USDA forecast for 2022/2023: **2,150**

Source: USDA-FAS
## U.S. Soybean Supply and Use

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Planted (mil. acres)</td>
<td>89.2</td>
<td>76.1</td>
<td>83.4</td>
<td>87.2</td>
<td>87.5</td>
<td>0%</td>
</tr>
<tr>
<td>Yield (bu./acre)</td>
<td>50.6</td>
<td>47.4</td>
<td>51.0</td>
<td>51.7</td>
<td>50.2</td>
<td>-3%</td>
</tr>
<tr>
<td>Production (mil. bu.)</td>
<td>4,428</td>
<td>3,552</td>
<td>4,216</td>
<td>4,465</td>
<td>4,346</td>
<td>-3%</td>
</tr>
<tr>
<td>Beg. Stocks (mil. bu.)</td>
<td>438</td>
<td>909</td>
<td>525</td>
<td>257</td>
<td>274</td>
<td>7%</td>
</tr>
<tr>
<td>Imports (mil. bu.)</td>
<td>14</td>
<td>15</td>
<td>20</td>
<td>16</td>
<td>15</td>
<td>-6%</td>
</tr>
<tr>
<td><strong>Total Supply</strong> (mil. bu.)</td>
<td><strong>4,880</strong></td>
<td><strong>4,476</strong></td>
<td><strong>4,761</strong></td>
<td><strong>4,738</strong></td>
<td><strong>4,634</strong></td>
<td><strong>-2%</strong></td>
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<tr>
<td>Crush (mil. bu.)</td>
<td>2,092</td>
<td>2,165</td>
<td>2,141</td>
<td>2,204</td>
<td>2,245</td>
<td>2%</td>
</tr>
<tr>
<td>Seed &amp; Residual (mil. bu.)</td>
<td>127</td>
<td>105</td>
<td>97</td>
<td>103</td>
<td>124</td>
<td>20%</td>
</tr>
<tr>
<td>Exports (mil. bu.)</td>
<td>1,752</td>
<td>1,682</td>
<td>2,266</td>
<td>2,158</td>
<td>2,045</td>
<td>-5%</td>
</tr>
<tr>
<td><strong>Total Use</strong> (mil. bu.)</td>
<td><strong>3,971</strong></td>
<td><strong>3,952</strong></td>
<td><strong>4,504</strong></td>
<td><strong>4,465</strong></td>
<td><strong>4,414</strong></td>
<td><strong>-1%</strong></td>
</tr>
<tr>
<td>Ending Stocks (mil. bu.)</td>
<td>909</td>
<td>525</td>
<td>256</td>
<td>274</td>
<td>220</td>
<td>-20%</td>
</tr>
<tr>
<td>Season-Avg Price ($/bu.)</td>
<td>8.48</td>
<td>8.57</td>
<td>10.80</td>
<td>13.30</td>
<td>14.00</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: USDA-WAOB
Demand Side

Soybean Export Volume

USDA forecast for 2022/2023: 2,045

Source: USDA-FAS
## World Corn Production

<table>
<thead>
<tr>
<th>Country or Region</th>
<th>2021/2022 estimate</th>
<th>2022/2023 forecast</th>
<th>Change from October 12</th>
<th>Change from 2021/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>1,217.5</td>
<td>1,168.4</td>
<td>-0.4</td>
<td>-49.1</td>
</tr>
<tr>
<td>United States</td>
<td>382.9</td>
<td>353.8</td>
<td>0.9</td>
<td>-29.1</td>
</tr>
<tr>
<td>Foreign</td>
<td>834.6</td>
<td>814.5</td>
<td>-1.2</td>
<td>-20.0</td>
</tr>
<tr>
<td>Argentina</td>
<td>51.5</td>
<td>55.0</td>
<td>--</td>
<td>3.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>116.0</td>
<td>126.0</td>
<td>--</td>
<td>10.0</td>
</tr>
<tr>
<td>Mexico</td>
<td>26.8</td>
<td>27.6</td>
<td>--</td>
<td>0.8</td>
</tr>
<tr>
<td>Canada</td>
<td>14.0</td>
<td>14.5</td>
<td>--</td>
<td>0.5</td>
</tr>
<tr>
<td>European Union</td>
<td>71.0</td>
<td>54.8</td>
<td>-1.4</td>
<td>-16.2</td>
</tr>
<tr>
<td>Serbia</td>
<td>6.0</td>
<td>5.4</td>
<td>--</td>
<td>-0.6</td>
</tr>
<tr>
<td>FSU-12</td>
<td>63.7</td>
<td>51.8</td>
<td>--</td>
<td>-11.9</td>
</tr>
<tr>
<td>Ukraine</td>
<td>42.1</td>
<td>31.5</td>
<td>--</td>
<td>-10.6</td>
</tr>
<tr>
<td>Russia</td>
<td>15.2</td>
<td>15.0</td>
<td>--</td>
<td>-0.2</td>
</tr>
<tr>
<td>South Africa</td>
<td>16.3</td>
<td>16.7</td>
<td>-0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>China</td>
<td>272.6</td>
<td>274.0</td>
<td>--</td>
<td>1.4</td>
</tr>
<tr>
<td>India</td>
<td>33.6</td>
<td>32.0</td>
<td>--</td>
<td>-1.6</td>
</tr>
</tbody>
</table>

Source: USDA-WASDE, November 2022
## World Soybean Production

<table>
<thead>
<tr>
<th>Country or Region</th>
<th>2021/2022 estimate</th>
<th>2022/2023 forecast</th>
<th>Change from October 12</th>
<th>Change from 2021/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>355.6</td>
<td>390.5</td>
<td>-0.5</td>
<td>34.9</td>
</tr>
<tr>
<td>United States</td>
<td>121.5</td>
<td>118.3</td>
<td>0.9</td>
<td>-3.3</td>
</tr>
<tr>
<td>Foreign</td>
<td>234.1</td>
<td>272.3</td>
<td>-1.4</td>
<td>38.2</td>
</tr>
<tr>
<td>Argentina</td>
<td>43.9</td>
<td>49.5</td>
<td>-1.5</td>
<td>5.6</td>
</tr>
<tr>
<td>Brazil</td>
<td>127.0</td>
<td>152.0</td>
<td>--</td>
<td>25.0</td>
</tr>
<tr>
<td>Paraguay</td>
<td>4.2</td>
<td>10.0</td>
<td>--</td>
<td>5.8</td>
</tr>
<tr>
<td>Canada</td>
<td>6.3</td>
<td>6.5</td>
<td>--</td>
<td>0.2</td>
</tr>
<tr>
<td>India</td>
<td>11.9</td>
<td>11.5</td>
<td>--</td>
<td>-0.4</td>
</tr>
<tr>
<td>China</td>
<td>16.4</td>
<td>18.4</td>
<td>--</td>
<td>2.0</td>
</tr>
</tbody>
</table>

--- No change.

Source: USDA-WASDE, November 2022

Yr-to-yr change: +10%

82% of Foreign

104% of World change
Wild Cards

Risk of Ship Traffic Jam: Low Water streamflow

USGS streamflow conditions

US Grain shipments for export
Source: Bloomberg.com

Source: USGS
Reminder: we are seeing unusually strong basis in the western cornbelt.

Risk of Ship Traffic Jam: Low Water streamflow

Source: US Drought Monitor, 10/25/2022
DTN Market Tracker, 11/10/2022
For the week of November 8, 37 percent lower than last week; 140 percent higher than last year; and 139 percent higher than the 3-year average.

The economic hit from the river’s historically low levels could reach $20 billion, according to AccuWeather.

Wild Cards

Risk of Ship Traffic Jam: Low Water streamflow

Illinois River barge freight rate

Source: USDA-AMS
Wild Cards

Risk of Railroad Strike

The threat of national rail strike eases, for now, as key union BMWED extends deal deadline

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REUTERS®

U.S. railroads, union extend strike deadline until at least Dec. 4

• Railroad strike’s new deadline is due on Dec 4
• A rail shutdown could impact 30% of U.S. cargo shipments by weight, stoke inflation, cost the economy as much as $2 billion per day (REUTERS, Nov. 9 2022)
Wild Cards

Risk of Railroad Strike

- High frequency of delayed shipping/unfilled orders (18 times more unfilled orders in Q3 2022 in yoy)
- Abnormally high secondary auction bids

Source: USDA AMS
Global Factors: Crop Progress in Brazil

- Record level production of corn and soybean is expected based on the current planting in Brazil

Source: Colussi, Schnitkey and Paulson, August 29, 2022, FarmdocDaily
Wild Cards

(How large) Recession is coming?

- Inflation is still high, and inflation-adjusted GDP has been weak since the first quarter of 2022
- Unemployment rate is 3.7% (Oct 2022)

Source: FRED
Wild Cards

(How large) Recession is coming?

• FedEx stock price is typically regarded as a leading indicator of business cycle

-35.68 (−16.89%) ↓ past 6 months

About 20% drop in a day, Sep 15, 2022

• Unlike Great Recession, we cannot expect liquidity provision by Fed
• Rate hikes will likely continue until 2023 (approx. 5 - 5.25%)

Source: Federal Reserve, Summary of Economic Projections (SEP), Sep 2022
Wild Cards

(How large) Recession is coming?

Exchange rate movements of major trade partners (base = Jan 3, 2022)

- Global recession is another possibility that needs to factor in
- Developing countries have already spent an estimated $379 billion to defend their currencies in 2022, but have suffered significant impact from capital flight (UNCTAD Trade Development Report 2022)
- Diminished purchasing power in foreign countries can bring a boomerang effect on US exports
New crop markets are showing negative shifts in supply and demand, implying elevated uncertainty. The USDA predicts smaller new crop production and smaller demand in the 22/23 season.

**Wild Cards**

Two transportation issues (low water level in Mississippi river system and possibility of railroad strike) can be critical in the next few weeks. The railroad strike deadline is on December 4.

Several unrealized demand side risks require attention:
- Global competition: Brazil (+ Latin countries) crop production
- Strong dollar
- Recession possibility

Closing remarks: “Don’t leave the market”
Thank you for your time!
Any questions?

Seungki Lee – Contact Information

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614-247-9170
• Prices seem to pass their peaks, but still they are relatively high
• It is possible that the input market would stay with high level of prices for a while

Input Price indices (Base year: 2011)

- All fertilizers
- Gasoline
- Nitrogen
- Potash & Phosphate

Source: USDA NASS
Appendix

Global Factors: War in Ukraine

• Some risks were dissolved by a combination of better-than-expected planting in Ukraine and favorable weather across the Black Sea region, and ag transportation deal among Ukraine, Russian, and Turkey.

Source: USDA-WAOB

Source: CME, MGEX
Several ideas floated about changing commodity programs in the next farm bill, and here are the few…

• Raising the reference price of the Price Loss Coverage (PLC)
  • In 21/22, the effective reference corn rate was $3.70/bu (season average price was $6.00/bu)
  • The current PLC safety net does not reflect the price rally after the Covid

• Combining the Agricultural Risk Coverage (ARC) and PLC
  • Revenue protection when price is high, price protection when price falls
  • More total payments to producers, but more difficult to determine the budget cost

• Margin-based safety net
  • Dairy margin program (month-to-month), but quite hard to design a budget that could stretch over two years

• Developing a permanent disaster assistance program for crops