U.S. Commodity Markets: Disease, Derecho, and Drought…Oh My!

Ben Brown
Agricultural Economics, The Ohio State University
11/13/2020
Commodity Outlook: Roadmap for Today

1. Very Quick Recap of 2020
   - COVID-19
   - Derecho
   - Drought

2. Current Conditions
   - Global Weather
   - Chinese Corn Demand

3. Outlook
   - Acreage 2021
   - Price Expectations
Coronavirus: The Black Swan

❖ Livestock- Health precautions of packing plant workers reduced capacity or shut down complete facilities.
  ❖ Large backlog of live animals,
  ❖ Suppressed live animal demand and prices, increased processed meat prices, and
  ❖ Greater consumption of food at home and retail vs food service consumption.

❖ Ethanol- Consumption is a component of gasoline demand.
  ❖ Economic, Behavior, and Social
  ❖ Roughly 40% of America working from home

❖ Government Assistance to Agriculture
  ❖ Coronavirus Aid, Relief, and Economic Security (CARES) Act
  ❖ Families First Coronavirus Response Act
  ❖ Credit Commodity Corporation traditional programs (CCC)

Black Swans: a metaphor describing an event that comes as a surprise, has a major effect, and is often inappropriately rationalized after the fact with the benefit of hindsight.
Commodity Markets: Price Drivers

Price = f(Supply, Demand) modified by Money Flow

Example: Corn in Apr/May 2020

In the short term- technicals drive the market, but in the long term- fundamentals drive the market.
COVID Impacts: Commodity Price Update

Change in Futures Prices Since First US COVID-19 Case on January 2, 2020 thru Nov. 12th, 2020 for most Active Contract

Soybeans, +20%
Class III Milk, +8%
Ethanol, +6%
Wheat, +5%
Corn, +4%
Hogs, -9%
Class IV Milk, -12%
WTI Crude Oil, -32%

Source: author calculation using ProphetX futures data
Does not account for Producer Price Differential
Biofuel Use: How Much Gas Are We Consuming??

- Consumption of motor gasoline is increasing from a low of almost 213 million gallons/day or a 49% reduction from 2019. Last week: down 6% instead of -9%
- Likely will not return to pre-COVID fuel use in 2020.
  - 11.9% decline in annual gasoline demand.
  - This is at current level of restrictions for rest of the year.
- Gasoline use is part economy, part pleasure, and part behavior.
  - Online primary schools (childcare?)
  - Work from home environment
  - Less flying might equal more driving
- Forecasted gasoline demand in 2021 and how the EPA sets the Renewable Volume Obligation (RVO) are going to be important for all biofuels in marketing year 20/21.

Data Sources: Historical - U.S. Energy Information Agency, Forecast - Author calculation using estimates for percentage declines in month gasoline consumption reported by US gasoline retailers to historical use.
Biofuel Use: Can we get back to normal in ethanol?

Us Weekly Ethanol Production

July 17: ended a 11 consecutive week rally in ethanol production

USDA Mar: 5,425 mil bu.
USDA Nov: 4,852 mil bu.
Difference: 573 mil bu.

Ohio Corn Prod.= 554 mil. Bu.

MY: implied roughly 580 mil bu. of corn less than anticipated.

Ending Stocks of Fuel Ethanol

Ethanol stocks are the tightest they have been since December 2016.

Data Source: US Energy Information Agency

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Biofuel Use: Why Does This Matter?

- What EPA does with the 2021 Renewable Volume Obligation will have large impacts on RIN markets.
  - EPA can increase the percent standard by holding the RVO constant to 2020.
    - This would push RIN prices up.
  - Or EPA can reduce the RVO to hold down the percent standard for 2021 comparable to 2020.
    - This would push RIN prices down.

Year over Year Change in Forecasted Gasoline and Diesel Demand

<table>
<thead>
<tr>
<th>Year</th>
<th>% Change</th>
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<tbody>
<tr>
<td>2017</td>
<td>1%</td>
</tr>
<tr>
<td>2018</td>
<td>3%</td>
</tr>
<tr>
<td>2019</td>
<td>2%</td>
</tr>
<tr>
<td>2020</td>
<td>2%</td>
</tr>
<tr>
<td>2021</td>
<td>-6%</td>
</tr>
</tbody>
</table>

Data Source: US Energy Information Agency - May Short-Term Energy Outlook

EPA delivers proposed rule to set 2021 RFS RVOs to OMB
By Erin Voegle | May 15, 2020

U.S. EPA puts 2021 biofuel blending mandate proposal on hold indefinitely, sources say
Stephanie Gali

GOP senators urge EPA not to raise renewable volume obligation for 2021
Published on October 23, 2020 by Dave Kovaleski

Reminder: Statute requires RVO rule by Nov. 30, 2020
Current Happenings: There is excitement on price!

Ohio Corn Cash Price Histogram
46% of Day Fell Between $3.40-$4.15

Ohio Cash Soybean Price Histogram
51% of Day Fell Between $8.50-$10.50
Current Happenings: The Tide Turned Quick!!!

U.S. Corn Ending Stocks by Month

Corn Stocks went from record high to 5-year lows within six months!

U.S. Soybean Ending Stocks by Month
COVID Impacts: Prevent Plant Acres

Theoretical Decision: Plant Corn or Plant Soybeans

New Crop Soybean (Nov. 20)/ New Crop Corn (Dec.) - Hardin County

Prospective Corn Planting 97 mil. acres
Actual Corn Planting: 91 mil. acres
Prospective Soy Planting 83.5 mil. acres
Actual Soy Planting: 83.1 mil. acres

Combined Prevent Plant Acres of Corn and Soybeans

PP Corn gar.: $3.10
PP Soy gar.: $7.34
Corn Share in 2020: 81%

Acreage data: USDA FSA
2020 Recap: Derecho (August 10, 2020)

Roughly 550,000 acres of ruined corn in Iowa alone—roughly about 401 million bushels total
2020 Recap: **Derecho (August 10, 2020)**

**Iowa New Crop Corn Basis Bids**

*Pre- Derecho*
August 2020

*Post Derecho Harvest*
October 2020

![Map of Iowa showing corn basis bids](image)

Data: DTN ProphetX

Photo Credit: Ag Twitter
2020 Recap: Late Summer US Drought
2020 Recap: Yield Deviations

US Corn Yield by State-Nov. Estimate
Absolute Bu. Difference (Aug-Nov)

US Soybean Yield by State-Nov. Estimate
Absolute Bu. Difference (Aug-Nov)

No Change
Moderate Increase
Substantial Increase
Moderate Decrease
Substantial Decrease

**Corn: Large Stocks, COVID, Drought, Derecho, Exports**

**US Corn- Ending Stocks (Red Bar) and Stocks to Use (Grey Line)**

- **Calculated yield and acres**: 3,318, 3,323
- **June Acreage Report**: 2,648
- **Survey Yield**: 2,756
- **Derecho/Drought Yield**: 2,503
- **Sept. Stocks and lower acres Yield and demand**: 2,167
- **Percent Stocks to Use**: 30%
- **Percent Ending Stocks to Use**: 30%

**Corn Price Regression to Stocks to Use Ratio**

- **Season Average Price Per Bushel**: $8.00
- **Percent Ending Stocks to Use**: 6.0% - 21.0%
- **2020**: Below 8%

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Corn Outlook Improving- but still no reason to ration demand.

Source: USDA WAOB
Soybeans: What a change in two years!

**US Soybeans- Ending Stocks**

- **Survey Yield**: 405
- **Drought Yield**: 610
- **Lower acres and increased exports**: 425
- **Lower yield**: 460
- **Percent Stocks to Use**: 290
- **Season Average Price Per Bushel**: 190

**Soybean Price Regression of Stocks to Use Ratio**

Source: USDA WAOB
Current Issues: World Happenings

Let’s Take a Trip Around the World!

Image Source: USDA Weather Report
Commodity Outlook: South America

Rain this week is improving conditions in Brazil.

“What if” there is a short crop in Argentina?
  - Possibilities for US Crush Exports?, What does Brazil do? (import taxes)
Soybean Demand: Domestic Soybean Crush

NOPA Soybean Monthly Crush - Oct. 15 Report

Source: National Oilseed Processors Associations

2019/20- 9 months set new records (Sep. Nov. and Aug.)

Soybean Crush Margin - October 20th

Data Source: DTN Prophet X
The Black Sea Region experienced one of the driest two-month periods in 36 years. Rain fell last week easing some drought pressure, but more is needed for wheat development. Much too late for corn crop. Warmer conditions are extending winter wheat dormancy, some which will help those areas receiving rain.

USDA Revised Outlook on Ukraine:
- Production: 315 mil. Bu.

Image Source: USDA Weather Report
Commodity Outlook: China

- China Corn Demand
- China Corn Stocks
- China Soybean Demand long term

The Bright Spot for U.S. Corn

Food Fever
Corn prices climb on supply shortage

Roughly $9.91/bu.


Business
China May Have 20 Million Ton Corn Deficit by 2020, Center Says

Report Name: China’s Corn Imports Estimated to Hit 22 Million Metric Tons
Country: China - People’s Republic of
Post: Beijing
Report Category: Grain and Feed
Commodity Outlook: China

- China Corn Demand
- China Corn Stocks
- China Soybean Demand long term

World Days of Corn Supply

Chinese Imports of World Corn

Thoughts: Would require a change in Chinese Policy.

- Self-Sufficiency
- Other Grains
- Flood their domestic market

Image Source: USDA FAS, PSD
Soybean Demand: Soybean Exports

World Soybean Commitments thru 10th Week of Marketing Year

Million Metric Tons

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<tr>
<td>China</td>
<td>16</td>
<td>21</td>
<td>18</td>
<td>16</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Unknown</td>
<td>7</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>ROW</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: USDA FAS

US Soybean Exports to China

Million Bushels

290% above last year

Source: USDA FAS
Demand: Exports vs Sales

Year to Date Exports Sales vs Seasonal Pace

<table>
<thead>
<tr>
<th>Crop</th>
<th>Year to Date Exports</th>
<th>Year to Date Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>15%</td>
<td>-13%</td>
</tr>
<tr>
<td>Soybeans</td>
<td>30%</td>
<td>5%</td>
</tr>
<tr>
<td>Grain Sorghum</td>
<td>29%</td>
<td>1%</td>
</tr>
<tr>
<td>Wheat</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>SR Wheat</td>
<td>4%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Year to Date Export Inspections vs Seasonal Pace

<table>
<thead>
<tr>
<th>Crop</th>
<th>Year to Date Export Inspections</th>
<th>Year to Date Seasonal Pace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>Soybeans</td>
<td>-2%</td>
<td>1%</td>
</tr>
<tr>
<td>Grain Sorghum</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Wheat</td>
<td>-13%</td>
<td>-15%</td>
</tr>
<tr>
<td>SR Wheat</td>
<td>5%</td>
<td>0%</td>
</tr>
</tbody>
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Source: USDA FAS
Export Demand: Is it real?

93% of South Dakota soybeans are exported through the Pacific Northwest to China.

Grain Sorghum Competition

Basis = Cash Price – Futures Price

Image Source: Stone X
Commodity Outlook: 2021 Acreage

Difference in Contribution Margins Ohio (Corn Minus Soybeans) as of Prior November

Favors Soybean Acres

Data Sources: Futures Prices and Historical Basis - DTN Prophetx
Variable Costs - OSU Production Budgets, Barry Ward

<table>
<thead>
<tr>
<th></th>
<th>Corn</th>
<th>Soybeans</th>
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<tbody>
<tr>
<td>Price</td>
<td>$3.72/ bu.</td>
<td>$9.91</td>
</tr>
<tr>
<td>Yield</td>
<td>190 bu./acre</td>
<td>59 bu./acre</td>
</tr>
<tr>
<td>Government</td>
<td>$13</td>
<td>$13</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>$720</td>
<td>$597</td>
</tr>
<tr>
<td>Seed</td>
<td>$111</td>
<td>$63</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>$112</td>
<td>$44</td>
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<tr>
<td>Chemicals</td>
<td>$46</td>
<td>$42</td>
</tr>
<tr>
<td>Other Variable</td>
<td>$153</td>
<td>$66</td>
</tr>
<tr>
<td>Total Variable</td>
<td>$422</td>
<td>$215</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>$298</td>
<td>$382</td>
</tr>
</tbody>
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Commodity Outlook: Long-term Outlooks

Outlook on U.S. Corn Demand (2001-2029)

- Actual
- February Forecast
- November Forecast

Outlook on U.S. Corn Prices (2019-2029)

- Actual
- February Forecast
- November Forecast

Source: USDA WAOB
Commodity Outlook: Long-term Outlooks

Outlook on U.S. Soybean Demand (2001-2029)

Outlook on U.S. Soybean Prices (2019-2029)

Source: USDA WAOB

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<tbody>
<tr>
<td>Area Planted</td>
<td>Mil.ac.</td>
<td>94.0</td>
<td>90.2</td>
<td>88.9</td>
<td>89.7</td>
<td>91.0 (-1)</td>
<td>90.5</td>
</tr>
<tr>
<td>Area Harvested</td>
<td>Mil. Ac.</td>
<td>86.7</td>
<td>82.7</td>
<td>81.3</td>
<td>81.3</td>
<td>82.5 (-1)</td>
<td>82.1</td>
</tr>
<tr>
<td>Yield</td>
<td>Bu./acre</td>
<td>174.6</td>
<td>176.6</td>
<td>176.4</td>
<td>167.5</td>
<td>175.8 (-2.7)</td>
<td>180.5</td>
</tr>
<tr>
<td>Beg. Stocks</td>
<td>Mil. Bu.</td>
<td>1,737</td>
<td>2,293</td>
<td>2,140</td>
<td>2,221</td>
<td>1,995 (-258)</td>
<td>1,702</td>
</tr>
<tr>
<td>Production</td>
<td>Mil. Bu.</td>
<td>15,148</td>
<td>14,609</td>
<td>14,340</td>
<td>13,620</td>
<td>14,507 (-393)</td>
<td>14,819</td>
</tr>
<tr>
<td>Imports</td>
<td>Mil. Bu.</td>
<td>57</td>
<td>36</td>
<td>28</td>
<td>42</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Total Supply</td>
<td>Mil. Bu.</td>
<td>16,942</td>
<td>16,939</td>
<td>16,509</td>
<td>15,883</td>
<td>16,527 (-651)</td>
<td>16,581</td>
</tr>
<tr>
<td>Feed and Res.</td>
<td>Mil. Bu.</td>
<td>5,470</td>
<td>5,304</td>
<td>5,429</td>
<td>5,827</td>
<td>5,700 (-125)</td>
<td>5,750</td>
</tr>
<tr>
<td>Food, Seed, In</td>
<td>Mil. Bu.</td>
<td>6,885</td>
<td>7,057</td>
<td>6,793</td>
<td>6,282</td>
<td>6,475 (-50)</td>
<td>6,450</td>
</tr>
<tr>
<td>Ethanol Crush</td>
<td>Mil. Bu.</td>
<td>5,432</td>
<td>5,605</td>
<td>5,378</td>
<td>4,852</td>
<td>5,050 (-50)</td>
<td>5,025</td>
</tr>
<tr>
<td>Exports</td>
<td>Mil. Bu.</td>
<td>2,294</td>
<td>2,438</td>
<td>2,066</td>
<td>1,778</td>
<td>2,650 (-325)</td>
<td>2,400</td>
</tr>
<tr>
<td>Total Use</td>
<td>Mil. Bu.</td>
<td>14,649</td>
<td>14,798</td>
<td>14,288</td>
<td>13,887</td>
<td>14,575 (+150)</td>
<td>14,600</td>
</tr>
<tr>
<td>Ending Stocks</td>
<td>Mil. Bu.</td>
<td>2,293</td>
<td>2,140</td>
<td>2,221</td>
<td>1,995</td>
<td>1,702 (-801)</td>
<td>1,981</td>
</tr>
<tr>
<td>Farm Price</td>
<td>$/Bu.</td>
<td>$3.36</td>
<td>$3.36</td>
<td>$3.61</td>
<td>$3.56</td>
<td>$4.00 (+$0.50)</td>
<td>$3.55</td>
</tr>
</tbody>
</table>

Source: USDA WAOB
## Soy Balance Sheet: Surprising Yields, Trade Optimism

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</tr>
</thead>
<tbody>
<tr>
<td><strong>Area Planted</strong></td>
<td>Mil. Acres</td>
<td>83.4</td>
<td>90.2</td>
<td>89.2</td>
<td>76.1</td>
<td>83.1 (-0.7)</td>
<td>90.5</td>
</tr>
<tr>
<td><strong>Area Harvested</strong></td>
<td>Mil. Acres</td>
<td>82.7</td>
<td>89.5</td>
<td>87.6</td>
<td>74.9</td>
<td>82.3 (-0.7)</td>
<td>88.4</td>
</tr>
<tr>
<td><strong>Yield</strong></td>
<td>Bu./Acres</td>
<td>52.0</td>
<td>49.3</td>
<td>50.6</td>
<td>47.4</td>
<td>50.7 (1.2)</td>
<td>51.0</td>
</tr>
<tr>
<td><strong>Beg. Stocks</strong></td>
<td>Mil. Bu.</td>
<td>197</td>
<td>302</td>
<td>438</td>
<td>909</td>
<td>523 (-52)</td>
<td>190</td>
</tr>
<tr>
<td><strong>Production</strong></td>
<td>Mil. Bu.</td>
<td>4,296</td>
<td>4,412</td>
<td>4,428</td>
<td>3,552</td>
<td>4,170 (-143)</td>
<td>4,616</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>Mil. Bu.</td>
<td>22</td>
<td>22</td>
<td>14</td>
<td>15</td>
<td>15 (0)</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total Supply</strong></td>
<td>Mil. Bu.</td>
<td>4,515</td>
<td>4,735</td>
<td>4,880</td>
<td>4,476</td>
<td><strong>4,806 (-194)</strong></td>
<td>4,821</td>
</tr>
<tr>
<td><strong>Soy Crush</strong></td>
<td>Mil. Bu.</td>
<td>1,901</td>
<td>2,055</td>
<td>2,092</td>
<td>2,165</td>
<td>2,180 (0)</td>
<td>2,205</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td>Mil. Bu.</td>
<td>2,166</td>
<td>2,134</td>
<td>1,752</td>
<td>1,676</td>
<td>2,200 (+75)</td>
<td>2,200</td>
</tr>
<tr>
<td><strong>Seed</strong></td>
<td>Mil. Bu.</td>
<td>105</td>
<td>104</td>
<td>88</td>
<td>96</td>
<td>103 (+3)</td>
<td>105</td>
</tr>
<tr>
<td><strong>Residual</strong></td>
<td>Mil. Bu.</td>
<td>41</td>
<td>5</td>
<td>39</td>
<td>16</td>
<td>35 (-3)</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total Use</strong></td>
<td>Mil. Bu.</td>
<td>4,214</td>
<td>4,297</td>
<td>3,971</td>
<td>3,953</td>
<td><strong>4,519 (+77)</strong></td>
<td>4,535</td>
</tr>
<tr>
<td><strong>Ending Stocks</strong></td>
<td>Mil. Bu.</td>
<td>302</td>
<td>438</td>
<td>909</td>
<td>523</td>
<td>190 (-270)</td>
<td>285</td>
</tr>
<tr>
<td><strong>Farm Price</strong></td>
<td>$/Bu.</td>
<td><strong>$9.47</strong></td>
<td>$9.33</td>
<td>$8.48</td>
<td>8.57</td>
<td><strong>$10.40 (+1.15)</strong></td>
<td>$9.80</td>
</tr>
</tbody>
</table>

Source: USDA WAOB
Commodity Outlook: Summary

❖ Fundamentals have greatly improved for both corn and soybeans, but especially for soybeans.

❖ Fund managers and speculators are “excited” about demand prospects:
  ❖ Delayed planting in South America
  ❖ Shortfall in available Chinese corn supply
  ❖ Increased M1 money supply

❖ Trade relations have improved.
  ❖ I choose to look at the glass as half full and the export picture is positive to me but caution again political winds.
  ❖ China’s breeding hog herd is recovering faster than expected on record profitability. Roughly $300 per pig.

❖ Looking ahead to 2021- it is likely and expected we will plant more acres of soybeans.
  ❖ Wheat also looks favorable, but I would recommend action on marketing to ensure profit.
Commodity Markets: Key indicators I’m watching

❖ COVID-19 Resurgence
  ❖ Stay at home orders reducing gasoline and ethanol demand and
  ❖ And international logistics of competitors.

❖ Chinese Demand
  ❖ Both corn and soybean export sales turning into export inspections,
  ❖ African Swine Fever escalations in Chinese pork sources, and
  ❖ Increase to Chinese Tariff Rate Quotas (TRQs) above current levels.

❖ South American Production
  ❖ La Nina weather pattern impacting planting and yields,
  ❖ South America as an importer of US commodities.

❖ Technical Money Flow into the Sector
  ❖ Dollar Index, inflation, interest rates, and
  ❖ M1 Money Supply
Thank You- Ohio!

It has been the greatest honor of my life to start my career working for the people of Ohio and I appreciate your support and friendship!

Ben Brown- Contact Information
660-492-7574- Mobile  bpbrown10@gmail.com