Anticipating the USDA Prospective Plantings
2012 Outlook for Corn, Soybeans and Wheat

March 27, 2012
2012 Agricultural Outlook & Expectations for March Stocks and Plantings Reports

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CME
March 27, 2012
The Causes of The Ag Bull Market Are Transitory as Well as Structural

- Two years in-a-row of below trend yields boosted corn prices.
- Higher corn prices supported wheat prices even though the Black Sea returned as world’s largest and cheapest source of wheat.
- 2011/12 crop markets were headed lower into 2012/13 BUT then a La-Nina induced drought struck the S. American crops in Dec-Jan. It will still be another month or two before the extent of crop losses are determined. This is supportive for “old crop” soybean and corn prices and for 2012/13 soybean price (but not corn).
- Assuming increased corn area planted and a return to trend yield, 2012/13 corn crop will be a record; stocks will double, prices will fall.
- Underlying food demand for agricultural products will continue to grow at a rate that most analysts believe requires both productivity advances AND increased area brought into production.
- Biofuel demand appears to be plateauing but energy price outlook and policy developments could have a significant impact on the markets in 2012/13 and beyond.
March Corn Stocks Expected to Be Higher Than Industry Expectations

March Corn Stock With Forecast for 2011/12

ARC Forecast 6,330 Mln Bu

Trade Ests.

6,400
6,160
5,925

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The Industry Tends to Over-Estimate March Corn Stocks

When Industry Over-estimates Mar Corn Stocks, Stocks are Often Are Below the Low End of Range of Expectations

Years Report Was Above Highest Estimate

Years Report Was Below Lowest Estimate

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USDA Not Expected to Change 4,600 Mln Bu Projection for Annual Corn F&R.
July Futures Could Drop 3-4% If Stocks are As Large as ARC’s Projection AND if There Are No Other Major Surprises.
Analysts Have Struggled With Estimating Corn Feed & Residual

It is Likely That Industry Has Over-estimated 2nd Qtr F&R By About 170 Mln Bu. Last Year Industry Under-estimated by 178 Mln Bu.
This Isn’t The First Time Industry F&R Estimates Were Way Off USDA Figures.
Model Projects Sharply Lower 2nd Qtr Corn F&R (Relative to Last Year’s)

F&R = F(Constant, Ethanol Corn Grind, Rail Shipments, 2nd Qtr Exports, Outstanding Corn Sales, Corn Basis, and Time)

Model Predicts Big Drop in 2nd Qtr Corn F&R

R-Sqrd = .94

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Model Projects BIG Drop in 2\textsuperscript{nd} Qtr F&R Compared to Last Year

This Yr’s F&R/Last Year’s F&R

ARC Forecasts Year-to-Year Drop in 2nd Qtr F&R Will 2nd Largest Ever
Because the Model is New and Untested, ARC Added 3 Std-Err’s to the Projection
First-Half (Sep-Feb) F&R Looks “Normal” Compared To Last Year

ARC Forecasts 1st Half F&R Share of Annual F&R Will Be Lower Than Last Year But in Line With Historical Average?
Declining 2nd Qtr F&R (Relative to the 1st Qtr’s) has Been a Long-term Trend

ARC Forecasts Smallest 2nd Qtr F&R Relative to the 1st Qtr But That Is In Keeping With the Historical Trend?

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ARC Projects 2012 Corn Seedings to Be Smaller Than Industry Expectations
Corn Seedings Have a Tendency to be Below the Average Trade Estimate

Industry Has Tendency to Over-estimate Corn Plantings and Sometimes Plantings Are Below Low End of Range of Expectations

Year Report Was Above the Highest Estimate

Years Report Was Below Lowest Estimate

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December Corn Futures Don’t Seem to Be Influenced by the Planting Report

Little Relationship Between Change in Dec Corn Futures One Week After Report Vs. Discrepancy Between Report and Expectations

Discrepancy Between Planting Report and Average of Industry Expectations

\[ R^2 = 0.0906 \]
March Soybean Stocks Expected to Be In-Line With Industry Estimates

March Soybean Stocks With Forecast for 2011/12

ARC Forecast 1,380 Mln Bu

Trade Ests.

1,467
1,371
1,270

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There is a Tendency for the Trade to Overestimate Soybean Stocks

Industry Has Bias to Over-estimate Mar Soybeans Stocks. Stocks are Sometimes Below the Low End of Range of Expectations

Years Report Was Above Highest Estimate

ARC Proj

Years Report Was Below Lowest Estimate
USDA Could Alter Stocks/Use Projection if There is a Big “Surprise” in March Soy Stocks
July Soybean Futures Have No Relationship to the Stocks Report?

Change in Jul Fut 1 Wk Later

No Relationship Between Change in July Futures One Week After Report Vs. Discrepancy Between Report and Average Expectation

\[
R^2 = 0.0046
\]

Discrepancy Between Stocks Report and Average of Industry Expectations

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ARC Projects 2012 Soybean Seedings to Be Larger Than Industry Expectations

Soybean Prospective Plantings With Forecast for 2012

ARC Forecast 76.00 Mln Ac

Trade Ests.
76.68
75.43
74.50
Soybean Seedings Have a “Slight” Tendency to be Below the Average Trade Estimate
November Soybean Futures Don’t Seem to Be Influenced by the Planting Report

Little Relationship Between Change in Nov Soybean Fut One Week After Report Vs. Discrepancy Between Report and Expectations

\[ R^2 = 0.1168 \]

Discrepancy Between Planting Report and Average of Industry Expectations
USDA Projecting 2012 Corn Yield at 164 Bu (vs. 147.2 in 2011)
It Makes a Difference How Many Years Are Used to Estimate a Linear Trend
4-Bushel Difference Between 20-Year & 30-Year Trend Yields & USDA Projection

US Corn Yields: Actual, USDA Outlook, 20-Year and 30-Year Continuous Rolling "Trend"

- Yield
- Trend (Rolling 20-Year)
- USDA Outlook Trend (1990-2010)
- Trend (Rolling 30-Year)

USDA = 164.0
20-Year = 161.1
30-Year = 160.0
ARC = 163.4
### USDA Has Used a Variety of Methods to Generate Corn “Trend” Yield Projections

<table>
<thead>
<tr>
<th>Year</th>
<th>Outlook Conf. (Bu/Ac)</th>
<th>May WASDE Yield (Bu/Ac)</th>
<th>Used to Estimate Years</th>
<th>Number of Years</th>
<th>May WASDE Notes</th>
<th>August Yield (Bu/Ac)</th>
<th>Jan Annual Yield (Bu/Ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>125.5</td>
<td>125.6</td>
<td>60-94</td>
<td>35</td>
<td>Linear trend.</td>
<td>125.6</td>
<td>113.5</td>
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<td>1996</td>
<td>127.0</td>
<td>126.0</td>
<td>60-95</td>
<td>36</td>
<td>Linear trend.</td>
<td>118.7</td>
<td>127.1</td>
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<tr>
<td>1997</td>
<td>128.0</td>
<td>131.0</td>
<td>60-96</td>
<td>37</td>
<td>Linear trend adjusted for planting progress.</td>
<td>125.3</td>
<td>127.0</td>
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<tr>
<td>1998</td>
<td>130.0</td>
<td>129.6</td>
<td>60-97</td>
<td>38</td>
<td>Linear trend.</td>
<td>130.0</td>
<td>134.4</td>
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<td>1999</td>
<td>132.0</td>
<td>131.8</td>
<td>60-98</td>
<td>39</td>
<td>Linear trend.</td>
<td>134.7</td>
<td>133.8</td>
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<tr>
<td>2000</td>
<td>135.5</td>
<td>137.0</td>
<td>75-99</td>
<td>25</td>
<td>Trend, Jul rain &amp; temps, planting progress mid-May.</td>
<td>141.9</td>
<td>137.1</td>
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<td>2001</td>
<td>135.9</td>
<td>137.0</td>
<td>60-00</td>
<td>41</td>
<td>Linear trend adjusted for planting progress.</td>
<td>133.9</td>
<td>138.2</td>
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<td>2002</td>
<td>137.9</td>
<td>137.9</td>
<td>60-01</td>
<td>42</td>
<td>Linear trend.</td>
<td>125.2</td>
<td>130.0</td>
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<tr>
<td>2003</td>
<td>139.7</td>
<td>139.7</td>
<td>60-02</td>
<td>43</td>
<td>Linear trend.</td>
<td>139.9</td>
<td>142.2</td>
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<td>2004</td>
<td>142.2</td>
<td>145.0</td>
<td>60-03</td>
<td>44</td>
<td>Linear trend, 1988 omitted, adjusted for planting progress.</td>
<td>148.9</td>
<td>160.4</td>
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<td>2005</td>
<td>145.6</td>
<td>148.0</td>
<td>60-04</td>
<td>45</td>
<td>Linear trend, 1988 omitted, adjusted for planting progress.</td>
<td>139.2</td>
<td>147.9</td>
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<td>2006</td>
<td>147.7</td>
<td>149.0</td>
<td>60-05</td>
<td>46</td>
<td>Linear trend, 1988 omitted, adjusted for planting progress.</td>
<td>152.2</td>
<td>149.1</td>
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<td>2007</td>
<td>152.8</td>
<td>150.3</td>
<td>90-06</td>
<td>47</td>
<td>Trend, Jul rain &amp; temps, planting progress mid-May.</td>
<td>152.8</td>
<td>151.1</td>
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<td>2008</td>
<td>154.9</td>
<td>153.9</td>
<td>90-07</td>
<td>18</td>
<td>Linear trend adjusted for planting progress.</td>
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<td>153.9</td>
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<td>2009</td>
<td>156.9</td>
<td>155.4</td>
<td>90-08</td>
<td>19</td>
<td>Linear trend adjusted for planting progress.</td>
<td>159.5</td>
<td>164.7</td>
</tr>
<tr>
<td>2010</td>
<td>160.9</td>
<td>163.5</td>
<td>90-09</td>
<td>20</td>
<td>Linear trend adjusted for planting progress.</td>
<td>165.0</td>
<td>152.8</td>
</tr>
<tr>
<td>2011</td>
<td>161.7</td>
<td>158.7</td>
<td>90-10</td>
<td>21</td>
<td>Linear trend adjusted for planting progress.</td>
<td>153.0</td>
<td>147.2</td>
</tr>
<tr>
<td>2012</td>
<td>164.0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
Corn Yields Correlated With Plant Populations But Other Factors Are Important Too.
Forget “Trend”, Use Previous Record High as a Benchmark for Estimating 2012 Yield?

US Corn Yields: Actual and Previous Record
Frequency Distribution of “Yields as % of Previous Record” is “Skewed” to Downside

Frequency that Corn Yields Fell Below or Above the Previous Record Yield (1970-2011)

- 70% of the time, yields were BELOW previous record
- 30% of the time, yields were ABOVE previous record

Percent By Which Yield Fell Below or Above Previous Record
Applying Frequency of “Yields as % of Previous Record” Implies a 2012 Yield of 155.5 Bu
Early Planted Corn “Tends” to Have Better Yields

![Graph showing percent corn planted May 15 and yield deviation from "trend" over years from 1974 to 2012. The graph displays data points for each year, comparing the percentage planted to the average and the deviation from a 20-year trend. The y-axis represents the percent planted ranging from 30% to 100%, and the x-axis represents the years from 1974 to 2012. The graph indicates that early planted corn tends to have better yields compared to late planted corn.](image-url)
If 2012 Corn is Planted Very Early, USDA Could Add 2 Bu (Maybe 3) to Yield Proj in May WASDE

Estimated Relationship Between Planting Date and Corn Yield (Scaled to USDA's 2012 Corn "Trend" Yield Projection of 164 Bu)

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Although Planting Date Matters, Rain & Temps are The Primary Determinants of Yield

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for March 15 - June 30, 2012
Released March 15, 2012

KEY:
- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events.

"Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.
A Fast Pace to Corn Planting “Tends” to Boost Final Corn Seeded Area Above Intentions

Changes in Final Corn Seedings (Vs. Prospective Plantings) Tends to Be Correlated With the Pace of Corn Planting

\[ R^2 = 0.1717 \]

Percent of Intended Corn Seedings Planted as of May 15th
A Fast Pace to Corn Planting “Tends” to “Take” Acres From Soybeans

Changes in Final Corn Seedings (Vs. Prospective Plantings)
Tends to Be Offset By An Opposite Change in Soybean Plantings

\[ R^2 = 0.3228 \]
S. American Soybean Crop Dropped 20% Between Dec-Jul in 2008/09. How Big Will Losses be in 2011/12?
Increased US Soy Exports Will Reduce Stocks and Raise Prices

Projected US Soybean Stks/Use & Gulf FOB $ (2008/09 & 2011/12)

Gulf FOB Soybean Price
Projected US Stks/Use

$14.25
Mar 23

Stks/Use Proj Partially Based on WASDE Changes Made in 2008/09

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The Return of Black Sea Exports!
FSU-12 Corn/Wheat/Barley Annual Exports - 31 MMTs Larger in 11/12 – A Record High Change from Prior Crop Year!
Russia’s Wheat Yields Highly Variable

![Graph showing wheat yields from 1987/88 to 2011/12. The graph compares Russia and the United States, with Russia having a CV=0.181 and the United States having a CV=0.096.](image)

Source: USDA 2012 Outlook Conference
Black Sea: An Unreliable Exporter Due to Embargoes of High Export Taxes
Weather Problems May Be Developing In the Northern Hemisphere

Canadian Prairies, Europe, Siberia-Kazakhstan and possibly a “Weak” Indian Monsoon

The 30-day Trend in Global Soil Moisture (Source: Climate Impact Co.)
Twice in Last 10 Years, the EU Has Been a “Net” Importer of Grain. Will That Happen Again in 2012/13?
The Structural Drivers of the World Ag Bull Market
Rising SE Asian Caloric Intake and US Ethanol Demand – the Chart That Started the Ag Bull Market (MMTs) in 2006

- **US Corn FSI Use**
- **Chinese Soy Imports**
Change in World Grain Use Since 2000 – 135 MMTs of Grain for Biofuels in ‘12
Chinese World Soybean Imports – Record 55-58 MMTs in 2011/12?
USDA Expects China to Open The Door to Corn Imports But That Requires A Change in Policy
US/EU vs. India/China Average GDP Growth

- Red line: India/China
- Blue line: US/EU
Delta in World Livestock Demand

- **BRIC**
- **EU & US**

Year: 1987 to 2012

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Chinese Core and Food Inflation Index
Even As China’s Growth Rate Declines, The Impact on Global GDP Will Still Be HUGE

Focus on real GDP growth rates can obscure volume impacts. For the latter, it’s better to look at the nominal increase in USD GDP.

In 2003-11, China added US$5.9 trn to global GDP.

For 2012-20, we estimate China will add US$26.5 trn to the global economy – nearly 5x the growth increment of 03-11, even though the real growth rate will slow by 1/3.

The increment in China’s 2020 GDP will be as big as China’s entire 2009 economy.

Assumptions:

<table>
<thead>
<tr>
<th></th>
<th>03-11</th>
<th>12-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP growth</td>
<td>10.7</td>
<td>7.5</td>
</tr>
<tr>
<td>GDP deflator</td>
<td>5.1</td>
<td>6.5</td>
</tr>
<tr>
<td>RMB/USD %ch</td>
<td>2.9</td>
<td>3.1</td>
</tr>
</tbody>
</table>
One of the Drivers Being Throttled Back – US Ethanol!
US Corn Used for the Production of Ethanol

<table>
<thead>
<tr>
<th>Year</th>
<th>Mil Bu</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
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<td>2002</td>
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<td>2009</td>
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<tr>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
</tr>
</tbody>
</table>
US Gasoline Demand/Ethanol
Daily Use: 10.2% Ethanol
U.S. Blended Gasoline Consumption

Source: USDA 2012 Outlook Conference
US Corn Ethanol Profitability – Start from 2007
Total US Ethanol Exports (Denatured & Un-denatured, Non-Beverage)
### Value of Crops, When Processed to Produce Biofuels (Based on BTU Equivalents)

<table>
<thead>
<tr>
<th>Crude Oil ($/Barrel)</th>
<th>$60</th>
<th>$80</th>
<th>$100</th>
<th>$120</th>
<th>$140</th>
<th>$160</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn ($/MT)</td>
<td>$158.98</td>
<td>$211.98</td>
<td>$264.97</td>
<td>$317.96</td>
<td>$370.96</td>
<td>$423.95</td>
</tr>
<tr>
<td>Wheat ($/MT)</td>
<td>$174.60</td>
<td>$232.81</td>
<td>$291.01</td>
<td>$349.21</td>
<td>$407.41</td>
<td>$465.61</td>
</tr>
<tr>
<td>Soybeans ($/MT)</td>
<td>$165.09</td>
<td>$220.13</td>
<td>$275.16</td>
<td>$330.19</td>
<td>$385.22</td>
<td>$440.25</td>
</tr>
<tr>
<td>Vegoil ($/MT)</td>
<td>$395.31</td>
<td>$527.08</td>
<td>$658.85</td>
<td>$790.62</td>
<td>$922.38</td>
<td>$1,054.15</td>
</tr>
</tbody>
</table>

Mar 05, 2012: crude oil at $107, corn at $260/mt, soybeans at $487/mt, wheat at $247/mt and soyoil at $1,184/mt.

Source: John Baize

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Corn Market is MUCH More Sensitive to Small Changes in Stocks/Use

Mar WASDE Stocks/Use

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Overall Conclusions

• Soybeans has replaced corn as the main driver in the crop markets and will probably remain so for the next 6 months as CME trades in a range of $13.50-$14.50. World vegoils are becoming a “demand-led” market with rapidly expanding S. AM biodiesel use.

• Global vegoil fundamentals (particularly palm oil and rapeseed) are becoming increasingly bullish.

• Could S. AM crop be down another 4-7 MMT? We still need to see whether Chinese demand will be 55-58 MMT. If it is, when will the shift to US soy begin (Jun-Aug or Sep-Feb)?

• China grain demand data called into question - keep an eye on cash prices. Rapidly rising disposable income is difficult to measure in terms of grain/meat demand.
Overall Conclusions

• The world is awash with wheat. Prices to languish in a broad trading range of $5.80-$7.20 CME unless 2012 world production is threatened by weather (or the US corn crop is threatened).

• As always, watch weather into spring planting. Corn market could EXPLODE if we suffer a 3rd year of yields 5+% below trend.

• Expect a broad trading range into spring/early summer!
Get More Commentary and Analysis on the March 30th USDA Prospective Plantings Report

Friday, March 30, 2012

- 7:30 a.m. CT  USDA Prospective Plantings Report Released
- 7:45 a.m. CT  Live OTC Agricultural Swaps Quotes
- 8:15 a.m. CT  Post-report Analysis by Commodity Expert Panel

Details available in post-simulcast email.
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