Fundamental Analysis for Corn and Soybeans

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• The process of analyzing supply and demand, developing price forecasts
Only 2.7 mil. soy A. in highest-risk S.E. U.S.

Estimated Asian Rust Risk

% of years out of 30 that climatic conditions are expected to support Asian soy rust

Note: Map based on 30 years of data to estimate infection potential.
Figure 1. World Feed Grain Production, Use & Months of Reserve Supply Beyond Pipeline Needs
Fundamental Analysis

- Role in Grain Marketing
- Key Concepts
- LDPs & Fundamental Analysis
- Analyzing Supply
- Analyzing Export Demand
- Analyzing Domestic Demand
- Seasonality
- Some Key Web Sites
- Current Examples
Why Forecast?
Market Risks are large
Business Decisions: based on expected costs & returns
• Crop rotation
• How much N to put on corn
• Sell @ harvest, store into summer?
• Contract for harvest or later delivery?
• Size of government payments?
• Base decisions on best available information
• More equal buyer/seller information
Fundamental vs. Technical Analysis

- **Technical**: road map and driving rules for traders as they follow market reaction to Supply-Demand

- **Fundamental**: anticipating future supply-demand changes & determining how they will affect prices

*In the short run, markets over react & deviate from fundamentals, but supply & demand ultimately rule the market*
Role of Fundamental Analysis

• Shows what to watch
• Gives guide to market sensitivity
• Helps quantify new market impacts
• Provides a benchmark price for plans
• Guiding principle: Price influenced by expected supply and demand
Objectives in This Session

– Understand how good forecasts are made
– Understand limitations of forecasts
– Identify good information sources
– Provide rules to help anticipate market reactions
– Update on corn & soybean outlook for 2005-06 and how outlook was developed
– Longer-term fundamentals
Forecasting Rules

- Search for the big picture
- New crop futures markets are not good forecasters
- *In forecasting, never say always*
- If you forecast, forecast often
- Have a good historical perspective
- Be a contrarian: majority is often wrong
- Respect market trends
- Inflation seldom increases corn & bean prices
83% of U.S. corn & soybeans are grown outside Iowa
Mil. Bu. Change in 2002 Corn Production vs. 2001

Big picture 2002

-504 814 below 2001-02 utilization

Basis Implications!
Some Principles

• The market guides production
• Demand has two dimensions: quantity & price
• Supply is two dimensional: quantity & price
• Market equilibrium: price where quantity demanded equals quantity supplied
• If quantity supplied exceeds quantity demanded, price declines
FORECASTING PROCEDURE: GRAIN

• Supply, demand, for competing products
• Prices influenced by current, expected future conditions
• Grain is a global Market

• Weather: the biggest supply factor
• Government policy: U.S. & foreign
Demand: Two dimensions

Price

Quantity
Inelastic Demand

Examples?

Price

Quantity
Elastic & Inelastic Demand

Which will cause greatest price sensitivity?
Elastic & Inelastic Demand

Which will cause greatest price sensitivity?

Price

S

S1

Quantity
Elastic & Inelastic Demand

Is elasticity of D for corn changing?
Elasticity of Demand

- Percent change in Quantity demanded with one percent change in Price
  - Corn: -.5%
  - Soybeans: -.4%

- Or 1% chg. in corn $S = 2\%$ chg. In price
- 1% chg. In SB $S = 2.5\%$ chg. in price

- With all other market factors unchanged
Altering S & D With Farm Policy

Freedom to Farm
LDP: A Clearance Sale Tool

- Corn, % of ‘99 crop with LDP taken 77
- Soybeans, % with LDP taken 88
- Wheat, % (1999) with LDP taken 83

2000 crop through Jan. 18, 01:
- U.S. corn 69
- Soybeans 77
- Wheat through 6/7/01: 79

2004 Corn 69
2004 Soybeans 40
Figure 7. U.S. Corn Price & Domestic Feeding, 1973-2002

Implies 1% increase in price decreases corn feeding by 0.42% (with other market factors constant)

Long-term elasticity @ mean = -0.42

Elasticity, 1989-2001 @ mean = -0.30

1970s to mid-1980s

1990s

2000’s
Processing to be 32% of demand vs. 16% exported

Impact on Elasticity of Demand?
Figure 7. U.S. Corn Price & Mil. Bu. Change in Domestic Processing, 1973-2004

- $ Per Bushel
- Mil. Bu. Change

- 1970s to mid-1980s
- 1995-96
- 2000s?
Three Grain Price Forecasting Methods

1. Carryover percent of total use
2. Computer forecasting model
3. Price flexibility based on elasticity of demand
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<tr>
<td><strong>Corn Balance Sheet (Mil. Bu.)</strong></td>
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<tr>
<td><strong>1/12/05</strong></td>
<td>65.0</td>
<td>72.7</td>
<td>70.5</td>
<td>72.4</td>
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<td>73.6</td>
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<td><strong>Bu./A.</strong></td>
<td>113.5</td>
<td>134.4</td>
<td>133.8</td>
<td>136.9</td>
<td>138.2</td>
<td>129.4</td>
<td>142.2</td>
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<td><strong>Production</strong></td>
<td>7,374</td>
<td>9,759</td>
<td>9,431</td>
<td>9,915</td>
<td>9,507</td>
<td>8,968</td>
<td>10,089</td>
<td>11,807</td>
<td>10,012</td>
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<td><strong>Carryover</strong></td>
<td>1,558</td>
<td>1,308</td>
<td>1,787</td>
<td>1,718</td>
<td>1,899</td>
<td>1,596</td>
<td>1,087</td>
<td>958</td>
<td>2,109</td>
</tr>
<tr>
<td><strong>Total Supply</strong></td>
<td>8,948</td>
<td>11,086</td>
<td>11,232</td>
<td>11,639</td>
<td>11,416</td>
<td>10,578</td>
<td>11,190</td>
<td>12,779</td>
<td>12,134</td>
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<td><strong>Feed &amp; resid.</strong></td>
<td>4,711</td>
<td>5,496</td>
<td>5,664</td>
<td>5,842</td>
<td>5,861</td>
<td>5,564</td>
<td>5,798</td>
<td>5,975</td>
<td>6,000</td>
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<td><strong>Food, ind. &amp; seed</strong></td>
<td>1,583</td>
<td>1,822</td>
<td>1,913</td>
<td>1,957</td>
<td>2,054</td>
<td>2,340</td>
<td>2,537</td>
<td>2,795</td>
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<td><strong>Exports</strong></td>
<td>2,228</td>
<td>1,981</td>
<td>1,937</td>
<td>1,941</td>
<td>1,905</td>
<td>1,588</td>
<td>1,897</td>
<td>1,900</td>
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<td><strong>Total Utilization</strong></td>
<td>8,522</td>
<td>9,299</td>
<td>9,515</td>
<td>9,740</td>
<td>9,820</td>
<td>9,491</td>
<td>10,232</td>
<td>10,670</td>
<td>10,890</td>
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<td><strong>Carryover</strong></td>
<td>426</td>
<td>1,787</td>
<td>1,718</td>
<td>1,899</td>
<td>1,596</td>
<td>1,087</td>
<td>958</td>
<td>2,109</td>
<td>1,244</td>
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<td><strong>U.S. FARM PRICE</strong></td>
<td>$3.25</td>
<td>$1.94</td>
<td>$1.82</td>
<td>$1.85</td>
<td>$1.97</td>
<td>$2.32</td>
<td>$2.42</td>
<td>$1.95</td>
<td>$2.50</td>
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<td><strong>IOWA AVE. PRICE, $/Bu.</strong></td>
<td>3.15</td>
<td>1.86</td>
<td>1.72</td>
<td>1.75</td>
<td>1.87</td>
<td>2.22</td>
<td>2.37</td>
<td>1.92</td>
<td>2.45</td>
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<td><strong>Counter-Cyclical Pmt.</strong></td>
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<td>0.00</td>
<td>0.00</td>
<td>0.40</td>
<td>0.00</td>
<td>0.35</td>
<td>0.40</td>
<td>0.00</td>
<td>0.00</td>
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<td><strong>HARV. PRICE, C.IA</strong></td>
<td>2.90</td>
<td>1.75</td>
<td>$1.40</td>
<td>1.60</td>
<td>1.65</td>
<td>2.00</td>
<td>1.92</td>
<td>1.60</td>
<td>2.40</td>
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<td><strong>DEC. FUT. @ HARV.</strong></td>
<td>$3.35</td>
<td>$2.10</td>
<td>$1.95</td>
<td>$2.05</td>
<td>$2.05</td>
<td>$2.52</td>
<td>$2.25</td>
<td>$1.98</td>
<td>$2.75</td>
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<td><strong>LONG-TERM PROBABILITY</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>18%</td>
<td>60%</td>
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<tr>
<td><strong>Weeks carryover supply</strong></td>
<td>2.6</td>
<td>10.0</td>
<td>9.4</td>
<td>10.1</td>
<td>8.5</td>
<td>6.0</td>
<td>4.9</td>
<td>9.9</td>
<td>5.9</td>
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</table>
Forecasting Model Result

160.2 bu./A. U.S. corn yield
11/12/04

Coefficients:

• **Exports/Supply**  \(0.15 \times 1.46\)
• **Stocks/use**  \(0.16 \times -0.76\)
• **0/1 Weather variable**  \(0 \times 0.22\)
• **Loan rate**  \(\$1.95 \times 0.27\)
• **Prev. Price**  \(2.42 \times 0.10\)
• **Wheat Price**  \(3.35 \times 0.40\)

• **Forecast 2004-05 U.S. avg. corn price** $\2.36$

**Freedom-to-farm adjust.** = $\2.02 \ (-0.145\%)$
Forecasting Model Result

Exports -10% vs. prev. year, wheat price $3.15/bu.

Coefficients:

- Exports/Supply 13% x 1.46
- Stocks/use 18 x -0.76
- 0/1 Weather variable 0 x 0.22
- Loan rate $1.95 x .27
- Prev. Price 2.42 x 0.10
- Wheat Price 3.15 x 0.40
- Forecast 2004-05 U.S. avg. corn price $2.24
  Freedom-to-farm adjust. = $1.91 (-0.145%)
Figure 12. Forecast & Actual Iowa Avg. Corn Price, Marketing Years, 1961-2002 & Model Forecast '03-04

- $4.00
- $3.50
- $3.00
- $2.50
- $2.00
- $1.50
- $1.00
- $0.50
- $0.00

- 1961
- 1964
- 1967
- 1970
- 1973
- 1976
- 1979
- 1982
- 1985
- 1988
- 1991
- 1994
- 1997
- 2000
- 2003

- Forecast
- Actual
Error in USDA May Corn Forecasts for next season, Mid-Point of Prices

Actual below forecast 45%, above 55%

Avg. Error +$0.02
Error in USDA Nov. Corn Forecasts for next season, Mid-Point of Prices

Forecast too low 28% of time, too high 72% of years,
Avg. Error -$0.02
Forecasting with price flexibilities

- Percent change in ’04-05 supply vs. Y/A
- Adjustment for demand growth
  - Feed use
  - Processing
  - Exports
- Forecast: Price flexibility x adjusted supply change x previous year’s price
- Adjustment for unusual developments, LDP
Forecasting with corn price flexibility (Price Elasticity -.5)

• ’04-05 corn supply + 14.2% or +1,589 mil. bu.
• Adjustment for demand growth
  – Feed use +175 mil. bu.
  – Processing +260 mil. bu.
  – Exports +0
• Adjusted supply chg. +1,154 mil. Bu. or +10.3%
• Forecast: 10.3% x 2 = -20.6% negative price impact
• Price forecast: $2.42 x .794 = $1.92 U.S. avg./bu.
• Forecast with -10% exports: $1.84/bu.
PROBABILITY DISTRIBUTION OF FORECASTS

• Needed for marketing choices
• Historical yield variability is a guide
• Soybeans this year with Asian Rust??
Figure 1. U.S. Corn & Soybean Yields, 1924-2003 & Est. 2004
Figure 6. U.S. Corn Yield, Percent Deviation From Trend, 1866-2003 & Prelim. 2004

40% of time yields are 8% or more above

20% of time yields are 8% or more below
U.S. Soybean Yield, Deviation From Trend, 1924-2003

Yields 5% or more above trend = 29% of years

Yields 10% or more above trend = 8% of years

Yields 5% or more below trend = 28% of years

Yields 10% or more below trend = 11% of years
FORECASTS OF MONTHLY CROP PRICES

• First concentrate on season average price, U.S.
• U.S. average typically above Iowa by relative constant amount
• Season average price adjusted to monthly via historical monthly pattern
  ❖ Two patterns: normal crop and short crop
Seasonal Indices of Iowa corn prices with Normal, Short Crop, Short Crop Less 1995 Crop Year, and All Years

1978-9 to 2002-03

- Price gain, Oct.-Jan. normal crops +5.2%
- Price gain, Oct.-Jan. short crops +13%
- Price gain, Jan.-May normal crops +7.7%
- Price gain, Jan.-May short crops +3.2%
## SOYBEANS SHORT-CROP YEARS

<table>
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<tr>
<th>Year</th>
<th>% Chg. In Use</th>
<th>% Chg. In Price</th>
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<tr>
<td>1980-81</td>
<td>-11</td>
<td>+20</td>
</tr>
<tr>
<td>1983-84</td>
<td>-14</td>
<td>+38</td>
</tr>
<tr>
<td>1988-89</td>
<td>-17</td>
<td>+35</td>
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<tr>
<td>1993-94</td>
<td>-10</td>
<td>+15</td>
</tr>
<tr>
<td>1995-96</td>
<td>-3</td>
<td>+23</td>
</tr>
<tr>
<td>2002-03</td>
<td>-4</td>
<td>+26</td>
</tr>
<tr>
<td>2003-04</td>
<td>-11</td>
<td>+33</td>
</tr>
<tr>
<td>Avg. all years</td>
<td>-10</td>
<td>+27</td>
</tr>
<tr>
<td>Avg. ’93-’02</td>
<td>-7</td>
<td>+24</td>
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Percent of time monthly Iowa corn Prices have declined from one month to the next, 1989-90 Through 2003-04 Marketing years
Figure 2. Weekly Average December Corn Futures, All Years, 1975 Through 2004 & 1985-2004--All Years
Figure 1. Change in December Corn Futures, Late Feb./May to Early Nov., 1975-2004

Prices declined, Feb./April-May to Nov., 80% of 30 yrs.
Sources of Supply Information

- Farmer surveys & aerial photos – for stocks & production
- Census reports (Exports, Mill stocks)
- Checks from processing & exports (wheat & soybeans)

\[(\text{production} + \text{stocks} + \text{imports} - \text{utilization} = \text{ending stocks})\]

4. Objective yield plots & surveys
OTHER SOURCES OF DATA

- Monthly USDA crop forecasts
- *Weekly crop & weather bulletin*
- Census exports & processing reports
- National Oilseed Processors Association
- Private crop forecasts
- USDA World S-D Reports
- USDA Weekly Export Inspections
- Weekly price support activity
Figure 3. Percent Change in U.S. Corn Plantings from Intentions Survey to Next January, 1965-2004

Avg. -.8%
Figure 4. Percent Change in U.S. Soybean Plantings From Intentions to Next January Est.

% of yrs. with increase from intentions = 63% all yrs., 67% freedom to farm years

All Yrs. Avg. +0.42 %; Freedom to farm yrs. +0.5%
Forecasting U.S. Corn Yields

• Yield: The biggest uncertainty in the Supply-Demand equation
• Corn Yield: 10% below trend for 2005 would cut production 1.2 bil. Bu. below expected use
• 10% above trend would put crop 1.07 bil. bu. Above expected use

• Price implications: Large
Wisner Corn yield forecasting model, Key variables

- Weekly crop % good-to-excellent, major states
- Percent of the crop planted, major states—by 3rd week of May
- Weather variable: 0-1
- Time trend to reflect new technology
- Best results: late July & August
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<td>Illinois</td>
<td>11</td>
<td>15.2%</td>
<td>86</td>
<td>76</td>
<td>43</td>
<td>77</td>
<td>86</td>
<td>83</td>
<td>59</td>
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<td>Indiana</td>
<td>6</td>
<td>7.7%</td>
<td>75</td>
<td>52</td>
<td>48</td>
<td>78</td>
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<td>Iowa</td>
<td>12</td>
<td>16.8%</td>
<td>76</td>
<td>85</td>
<td>61</td>
<td>63</td>
<td>73</td>
<td>78</td>
<td>70</td>
<td>98</td>
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<td>Kansas</td>
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<td>3.8%</td>
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<td>81</td>
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<td>2.4%</td>
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<td>4.0%</td>
<td>54</td>
<td>82</td>
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<td>85</td>
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<td>Major States</td>
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<td>49</td>
<td>69</td>
<td>74</td>
<td>78</td>
<td>68</td>
<td>86</td>
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<tr>
<td>U.S. Avg. Yield</td>
<td>71.98</td>
<td>100.0%</td>
<td>145?</td>
<td>142</td>
<td>130</td>
<td>138.2</td>
<td>137.1</td>
<td>134</td>
<td>134.4</td>
<td>138.6</td>
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<tr>
<td>% Dev. From Trend Yield</td>
<td></td>
<td>+1.4%?</td>
<td>+0.8</td>
<td>-6.8</td>
<td>0.5</td>
<td>1.0</td>
<td>0.1</td>
<td>2.1</td>
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<tr>
<td>% of U.S. acres below 60% G/E</td>
<td></td>
<td>6.8%</td>
<td>14.6%</td>
<td>57.9%</td>
<td>15.5%</td>
<td>10.6%</td>
<td>1.3%</td>
<td>25.4%</td>
<td>0.0%</td>
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Figure 4. Forecast & Actual U.S. Average Corn Yields, Late July

Based on % planted 3rd wk. of May, % good-excellent 3rd wk. of July, trend, 0-1 weather variable.

R2 = .956
Figure 1. USDA Corn Yield Forecasts, Percent Change from October to Season Final Estimate

Avg. Change, All Years except major weather-stress years: +2.1%

* Major weather stress years

Avg. All Years, +0.7%
Years Since 1965 With $\Rightarrow$ +10% of Trend Yield

Corn

- 10 years out of 39  (26% of time)
- All except one increased, Oct. to Season Final
- Avg. increase: 2.6%
- Impact 2004 from +2.6% = 302 mil. Bu.
- Would push total production to 11.91 bil. Bu.
- Largest & smallest impacts: 11.8-12.3 bil. Bu.
Figure 2. USDA Soybean Yield Forecasts, Percent Change October to Season Final, 1965-2003

Avg. Change, All Years except major weather-stress years: +0.88%
Years Since 1965 With => +7% of Trend Yield

Soybeans

- 5 years out of 39  (13% of time)
- 4 increased, Oct. to Season Final, 1 was unchanged
- Avg. increase: 1.96%
- Impact 2004 from +1.96% = 61 mil. Bu.
- Would push total production to 3.17 bil. Bu.
FORECASTING FEED USE OF CORN

Key Variables:
• Grain-consuming animal numbers
• Availability of substitutes
  ❖ U.S. feed wheat
  ❖ Grain sorghum
  ❖ Barley
  ❖ Corn quality
  ❖ Livestock marketing weights
  ❖ Livestock/crop price ratio
  ❖ Time trend (incl. New technologies)
<table>
<thead>
<tr>
<th>Corn Feed Use:</th>
<th>2003-04</th>
<th>2004-05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 1 stocks</td>
<td>1,087</td>
<td>958</td>
</tr>
<tr>
<td>Prodn</td>
<td>10,089</td>
<td>11,807</td>
</tr>
<tr>
<td>imports</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>11,179</td>
<td>12,769</td>
</tr>
<tr>
<td>Less:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>470</td>
<td>448</td>
</tr>
<tr>
<td>Processing</td>
<td>598</td>
<td>665</td>
</tr>
<tr>
<td>Ending stocks</td>
<td>7,954</td>
<td>9,449</td>
</tr>
<tr>
<td>Indicated feed use</td>
<td>2,157</td>
<td>2,207</td>
</tr>
<tr>
<td>Percent chg.</td>
<td></td>
<td>2.3%</td>
</tr>
<tr>
<td>Description</td>
<td>2003-04</td>
<td>2004-05</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Sept. 1 stocks</td>
<td>178</td>
<td>112</td>
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<tr>
<td>Prodn</td>
<td>2,453</td>
<td>3,141</td>
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<tr>
<td>imports</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>2,631</td>
<td>3,253</td>
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<tr>
<td>Less:</td>
<td></td>
<td></td>
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<tr>
<td>Exports</td>
<td>354</td>
<td>366</td>
</tr>
<tr>
<td>Processing</td>
<td>418</td>
<td>429</td>
</tr>
<tr>
<td>Ending stocks</td>
<td>1,520</td>
<td>2,305</td>
</tr>
<tr>
<td>Indicated residual</td>
<td>339</td>
<td>154</td>
</tr>
<tr>
<td>Percent chg.</td>
<td></td>
<td>-54.6%</td>
</tr>
</tbody>
</table>
Figure 3. U.S. Corn & Wheat Exports, 1867-2004

Data source: USDA
<table>
<thead>
<tr>
<th>Region</th>
<th>Wheat crop % change vs. 03-04</th>
<th>Feed grain crop % chg. vs. 03-04</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>+27</td>
<td>+22</td>
</tr>
<tr>
<td>Other Europe</td>
<td>N.A.</td>
<td>+58</td>
</tr>
<tr>
<td>Canada</td>
<td>+10</td>
<td>+1</td>
</tr>
<tr>
<td>Former Sov. Reps.</td>
<td>+39</td>
<td>+13</td>
</tr>
<tr>
<td>China</td>
<td>+4</td>
<td>+9</td>
</tr>
<tr>
<td>Argentina</td>
<td>+19</td>
<td>+26</td>
</tr>
<tr>
<td>Brazil</td>
<td>-6</td>
<td>0</td>
</tr>
<tr>
<td>Australia</td>
<td>-14</td>
<td>-15</td>
</tr>
<tr>
<td>India</td>
<td>+11</td>
<td>N.A.</td>
</tr>
<tr>
<td>Mexico</td>
<td>N.A.</td>
<td>-6</td>
</tr>
<tr>
<td>World</td>
<td>+12.3</td>
<td>+9.5</td>
</tr>
</tbody>
</table>

N.A. – not available
World Wheat Feeding, Mil. Bu. Corn Equivalent
# Corn Export Sales

**1/13/05**

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>-9%</td>
</tr>
<tr>
<td>Africa</td>
<td>-6%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>-23%</td>
</tr>
<tr>
<td>Other Asia</td>
<td>-21%</td>
</tr>
<tr>
<td>W. Hemisphere</td>
<td>+4%</td>
</tr>
<tr>
<td>Unknown</td>
<td>-37%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-10%</strong></td>
</tr>
</tbody>
</table>

**Chg. Vs. ’95**  
-39%

**Chg. Vs. ’96**  
-10%

**Needed winter sales:** 1.1-1.2 mil. Tons/wk.
Global Corn Competitors

- Canada
- European Community
- Eastern Europe
- Argentina
- Australia
- China
- Brazil
- India (sometimes)
- Ukraine, other FSU
Figure 2. U.S., Foreign, and World Coarse Grain Exports

Source: USDA 12/10/04
Other competitors: Feed wheat, barley

Figure 1. World Corn Exports, 2002-03
http://www.fas.usda.gov/pecad/
Northeast Asia
Percentage of Normal Precipitation for
April, 2001

BridgeNews™
Global Weather Services
China Crop Conditions

Source: Bridge News, Global Weather Service
6/06/01
Canada 90-Day Precipitation Outlook
for March - May, 2001

Map showing precipitation outlook with color codes:
- Much Below
- Below
- Near
- Above
- Much Above

Source: Environment of Canada

BridgeNews™
GLOBAL WEATHER SERVICES
What to Look For in Sources of Outlook Information

- Good detail on international conditions
- Use of probabilities
- Up-to-date
- Advisable to use several sources + USDA
- Technical analysis can supplement fundamental analysis
- Keys for 2001-02: U.S. crops & China
Wisner Web Site:

http://www.econ.iastate.edu/faculty/wisner/
Sources of Outlook Information

http://www.tfc-charts.w2d.com/custom_menu.php3
http://ffas.usda.gov/
http://usda.mannlib.cornell.edu/
http://www.farmdoc.uiuc.edu/marketing/index.html
http://www.econ.iastate.edu/faculty/wisner/
http://www.agecon.ksu.edu/risk/
http://www.msu.edu/user/hilker/
http://pacific.commerce.ubc.ca/xr/data.html
http://www.ag.ndsu.nodak.edu/cow/.
http://www.agric.gov.ab.ca/index.html
http://www.cbot.com/mplex.htm
Soybean Market Analysis & Outlook
Cash prices, low $4.00s to upper $3.00s
Figure 3. Trends in World Soybean Production & Use
Asian Rust

- Greatest Area of Risk: 12 mil. A. in South
- Can be controlled by spraying
- Most vulnerable time: flowering
- Risk affected by no. of rains
- Great Plains lower risk
- An insurable risk
- Plant all corn? Look first at markets
Corn/corn: Harvest hedge price $2.02
Less variable prod’n costs
@ 155 bu./A. (ISU farms avg. diff.) 1.70
Net/bu. 0.32
Net/A. $49.60

Corn/soy: Harvest hedge price $4.98
Less variable prod’n costs
@ 44 bu./A. & $21/A. spraying 3.14
Net/bu. 1.84
Net/A. (excludes aphid spraying cost) $80.96

2nd yr. corn yield no more than 2.5% below 1st year
matches returns to soybeans if you spray once

Spray twice: can match sb with corn yld. -8.5% vs c/s
Corn vs. Soybean Return Over Variable Cost, 01/25/05, C. Iowa

$ Per Acre

- **Corn/Corn returns, varying yield drag**
- **Soy Rust, 4 bu. Yld. loss & One Spray**
- **Soy Rust, 4 bu. yld. loss & 2 Sprays**

Corn Yield Drag vs. Corn/Soybeans
Other Soy/Corn Shift Considerations

- Shorter plant/harvest window
- Labor requirements
- Storage/handling/drying needs
- Tillage?
- More N for corn
- Will Southern Acreage/yield drop boost prices to cover extra spraying cost?
- More corn Acres: impact on corn price?
- Adequate spray equipment?
- Timeliness of spraying
Destinations of U.S. Soybean Exports 2003-04

- China
- EU
- Mexico
- Japan
- Korea
- Canada
- Africa
- Indonesia
- Thailand
- Others
<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>+8%</td>
</tr>
<tr>
<td>Africa</td>
<td>+130% (+10.9mil. bu.)</td>
</tr>
<tr>
<td>EU</td>
<td>+13%</td>
</tr>
<tr>
<td>Japan</td>
<td>-25%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>-38%</td>
</tr>
<tr>
<td>Other Asia</td>
<td>-17%</td>
</tr>
<tr>
<td>W. Hemisphere</td>
<td>-21%</td>
</tr>
<tr>
<td>Unknown</td>
<td>+40%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>+1%</strong></td>
</tr>
</tbody>
</table>

Vs. 2001:

- **SBM** +7%; **SBO** +82%
Figure 1. Monthly U.S. Soybean Crushings, 2000-01 Through 2003-04 Marketing Years

July-Aug. 2003-04 (-11%)
<table>
<thead>
<tr>
<th>Date</th>
<th>Soybean Balance Sheet (Mil. Bu.)</th>
<th>R. Wisner, ISU Econ.</th>
<th>2004-05</th>
<th>2005-06</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARV. A.,MIL.</td>
<td>61.6</td>
<td>70.4</td>
<td>72.4</td>
<td>72.4</td>
</tr>
<tr>
<td>BU./A.</td>
<td>35.3</td>
<td>38.9</td>
<td>36.6</td>
<td>38.1</td>
</tr>
<tr>
<td>PRODUCTION</td>
<td>2,174</td>
<td>2,741</td>
<td>2,654</td>
<td>2,758</td>
</tr>
<tr>
<td>CARRYOVER</td>
<td>335</td>
<td>200</td>
<td>348</td>
<td>290</td>
</tr>
<tr>
<td>TOTAL SUPPLY</td>
<td>2,514</td>
<td>2,945</td>
<td>3,006</td>
<td>3,052</td>
</tr>
</tbody>
</table>

**UTILIZATION:**

| CRUSH       | 1,370    | 1,590    | 1,579   | 1,640   | 1,700   | 1,615   | 1,530   | 1,655 | 1,605 | 1,665 | 1,680 |
| EXPORTS     | 851      | 801      | 973     | 996     | 1064    | 1044    | 885     | 1,015 | 980  | 1,060 | 1,075 |
| OTHER DOMESTIC | 109   | 205      | 164     | 169     | 169     | 132     | 111     | 160  | 160  | 160  | 160  |
| TOTAL       | 2,330    | 2,596    | 2,716   | 2,804   | 2,933   | 2,791   | 2,526   | 2,830 | 2,745 | 2,885 | 2,915 |
| CARRYOVER   | 183      | 348      | 290     | 248     | 208     | 178     | 112     | 428  | 102  | 417  | 530  |

**U.S.wtd. AVG. PRICE, $/T**

- 1995-6: 6.72
- 1998-9: 4.93
- 1999-00: 4.63
- 2000-01: 4.54
- 2001-02: 4.38
- 2002-03: 5.53
- 2003-04: 7.34
- 2004-05: 5.15
- 2005-06: 7.50

**Counter-Cyclical Pmt.**

- 1995-6: 0.00
- 1998-9: 0.00
- 1999-00: 0.21
- 2000-01: 0.00
- 2001-02: 0.26
- 2002-03: 0.36

**IA. AVG. PRICE, $/Bu.**

- 1995-6: 6.67
- 1998-9: 4.83
- 1999-00: 4.53
- 2000-01: 4.44
- 2001-02: 4.34
- 2002-03: 5.53
- 2003-04: 7.25
- 2004-05: 5.05
- 2005-06: 7.40

**N.C.IA.HARV.PRICE**

- 1995-6: 6.75
- 1998-9: 4.80
- 1999-00: 4.35
- 2000-01: 4.35
- 2001-02: 4.10
- 2002-03: 5.20
- 2003-04: 7.25
- 2004-05: 4.70
- 2005-06: 7.35

**MEAL DECATUR, $/T 48%**

- 1995-6: $236
- 1998-9: $139
- 1999-00: $147
- 2000-01: $174
- 2001-02: $169
- 2002-03: $182.00
- 2003-04: $239
- 2004-05: $160
- 2005-06: $232

**SOY OIL, DECATUR**

- 1995-6: 24.7
- 1998-9: 19.9
- 1999-00: 15.6
- 2000-01: 14.2
- 2001-02: 16.5
- 2002-03: 22.0
- 2003-04: 30.0
- 2004-05: 23.0
- 2005-06: 32.0

**NOV. FUT. AT HRV., $/B**

- 1995-6: 7.15
- 1998-9: 5.30
- 1999-00: 4.95
- 2000-01: 4.95
- 2001-02: 4.35
- 2002-03: 5.65
- 2003-04: 7.70
- 2004-05: 5.15
- 2005-06: 7.80

**Historical Probability**

- 20%: 4.1
- 65%: 7.0
- 15%: 5.6

**Weeks carryover supply**

- 1995-6: 4.1
- 1998-9: 7.0
- 1999-00: 5.6
- 2000-01: 4.6
- 2001-02: 3.7
- 2002-03: 3.3
- 2003-04: 2.3
- 2004-05: 8.2
- 2005-06: 1.9

**Historical Probability**

- 20%: 4.1
- 65%: 7.0
- 15%: 5.6
Forecasting Soybean Price

• Supply up 621 million bushels vs. yr. ago
• Use up 304 mil. Bu.
• Net: +317 mil. Bu. Or 12%
• 2.5 x 12% = -30% on price
• Indicated 04-05 price = $5.16
• LDP impact could take price $0.70 to $1.00 lower, except for Asian rust

Red = '78 Through 2004: low-high = $0.49
Blue = '78 Through 2003: low-high = $0.40
Dark Blue = 1990-2003: low-high = $0.49
Black = 1997-2003: low-high = $0.56

% of Time Prices Declined
Figure 5. Weekly Nov. Soybean Futures Prices, All Years

$ Per Bu.

JAN 4  MAR 1  APR 1  MAY 2  JUN 2  JUL 3  AUG 4  SEP 4  NOV 1

Avg. 1985-04
Avg. 1975-04
Avg. 1990-04
Figure 4. Change in Nov. Soy Futures, Mid-Feb. After Short U.S. Crops & Early April or Mid-May After Normal Crops vs. Mid-Oct., 1975-2004

Prices Rose 33% of Years, Declined 67%. Avg. Decline, all years, = $0.25/Bu. (April) & $0.25 (May)

Past results are no guarantee of future performance

Avg.
Key Points

• Low but not zero risk storing corn into spring
• Old-crop corn contracting: low risk
• Soybeans: scale up marketing
• Manage LDPs carefully
• Look for spring 2005-crop pricing opportunities—especially on corn
• Watch weekly export sales reports: corn needs to be 1.1-1.2 mil. tons/week
• *SB* export sales: 0.8-1.0 mil. Tons/wk.
Other competitors: Feed wheat, barley

Figure 1. World Corn Exports, 2002-03
Figure 3. China corn yield & area harvested

Source of data: USDA PS&D

(2004 Trend yield & 2003 Harv. A. = 141.5 Mil. Tons
USDA 8/12/04 projection = 120 mil. Tons)

Bu. Per Acre

Mil. Acres


Bad Weather halts yield uptrend

Yield
Area Harvested
Figure 7. Ten-Year China Net Corn Export Projections, FAPRI and USDA, 2004
Figure 5. China's Net Corn Imports, 1970-2003 Marketing Years & Projected 2004

Bars above zero are imports, below indicate net exports
Figure 6. China Gross Corn Imports & USDA Projections
Figure 2. China Corn Carryover Stocks With Varying Revision Dates & Comparison With U.S. Stocks
Chinese Grain Storage
150-180 mil. Bu.?
Figure 8. China Broiler Meat production  Source: USDA, PSD
Figure 9. China Swine Numbers
Source: USDA, PSD
Ethanol: Rapid expansion with major implications for agriculture

• 73 plants nationally in planning and/or construction phase

• At 20 mil. Bu./yr., adds 1.46 billion potential new processor demand
<table>
<thead>
<tr>
<th>Location</th>
<th>Mil. Bu. Processing Capacity</th>
<th>Location</th>
<th>Mil. Bu. Processing Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedar Rapids</td>
<td>273</td>
<td>Iowa Falls</td>
<td>15</td>
</tr>
<tr>
<td>Clinton</td>
<td>152</td>
<td>Galva</td>
<td>10</td>
</tr>
<tr>
<td>W. Burlington</td>
<td>18</td>
<td>Planned or construction</td>
<td></td>
</tr>
<tr>
<td>Muscatine</td>
<td>4</td>
<td>Steamboat Rock</td>
<td>8</td>
</tr>
<tr>
<td>Hanlontown</td>
<td>17</td>
<td>Albert City</td>
<td>38</td>
</tr>
<tr>
<td>Marcus</td>
<td>20</td>
<td>Emmetsburg</td>
<td>19</td>
</tr>
<tr>
<td>Lakota (cap. To 40 mil. Bu)</td>
<td>20</td>
<td>Denison</td>
<td>19</td>
</tr>
<tr>
<td>Ashton</td>
<td>18</td>
<td>Ft. Dodge</td>
<td>42</td>
</tr>
<tr>
<td>Hopkinton (Uses sugar &amp; strach)</td>
<td>0</td>
<td>Humboldt County</td>
<td>18</td>
</tr>
<tr>
<td>Sioux Center</td>
<td>18</td>
<td>Belle Plaine</td>
<td>31</td>
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<td>Coon Rapids</td>
<td>18</td>
<td>Mason City</td>
<td>15</td>
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<td>Blair, NE</td>
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<td>Goldfield</td>
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<tr>
<td>Albert Lea, MN</td>
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<td>Nevada</td>
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<tr>
<td>Luvurne, MN</td>
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<td>Faribank</td>
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<tr>
<td>Keokuck</td>
<td>8</td>
<td>Gowrie</td>
<td>22</td>
</tr>
<tr>
<td>Eddyville</td>
<td>13</td>
<td>Jewell</td>
<td>24</td>
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<tr>
<td>Sub-total</td>
<td>634</td>
<td>Revived Blairstown</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One additional location</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-total</td>
<td>366</td>
</tr>
</tbody>
</table>

Grand total, processing for ethanol only: 1,000 Mil. Bu.
Replaces about 171 mil. Bu of corn in feeding + Soy Meal
Iowa Corn Processing & Ethanol Plant Locations, Actual & Planned, 12/17/04

<table>
<thead>
<tr>
<th></th>
<th>Proj. '03</th>
<th>Proj. '08 I</th>
<th>Proj. '08 II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>115</td>
<td>10</td>
<td>-19</td>
</tr>
<tr>
<td></td>
<td>167</td>
<td>123</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>254</td>
<td>138</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>207</td>
<td>114</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>-248</td>
<td>-296</td>
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<td></td>
<td>102</td>
<td>106</td>
<td>106</td>
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<tr>
<td></td>
<td>51</td>
<td>55</td>
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<td>106</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>-24</td>
<td>-35</td>
<td>-49</td>
</tr>
</tbody>
</table>

Key Assumption: Corn acres @ 2004 level

'03 '08 I '08 II '03 '08 I '08 II '03 '08 I '08 II
803 370 205
Iowa Corn Yield Per Acre

16% Above Trend
Needed IA Crop Acreage Adjustments to Maintain 2003 Corn Export Availability

• Alternative I: Plants
  – Operate at Rated Cap.
  – Corn Acres + 16%
  – SB Acres -19%

• Alternative II: Plants
  – Operate at 120% of Rated Cap.
  – Corn Acres + 23%
  – SB Acres -28%

• Corn/Soy mil. acres 2008 in Iowa:
  – 14.2/8.2 & 15/7.4  2004: 12.4 corn, 10.2 SB)
U.S. Acreage Implications

- Potential added processing demand: 1.44 bil. Bu.
- Potential demand: 12.0 bil. Bu.
- Current corn acres: 73.3 mil. Acres
- Needed extra acres: 7 to 10 million
  --More if China becomes corn importer
Figure 1a. U.S. Corn Production, Domestic Use, & Availability for Exports--Projections to 2008 with 71 New plants by 2008
Questions for Corn Use

• Tight supplies--which users can out-bid others?
• U.S. production shift, beans to corn?
• Bring back part of 34 million CRP acres?
• Impact on land values & Ag structure?
• Impact on exporting firms & basis?
• More investments such as Bunge & Cargill’s Caribbean ethanol dehydration plants?
Questions for Corn Users

• Basis impacts, merchandising margins?
• Intensified competition in grain acquisition
• Changing role of train-load shippers
• Need for sharply increased storage space, drying capacity with more corn
• Impact on crop input demand?
• Livestock industry: higher corn prices, possibly lower protein cost for dairy, maybe hogs.
• How does bio-diesel fit in?
• Most ethanol plants below optimum size for shipping DGS by train
Rotation Considerations

• Corn/soybean rotation spreads labor needs
• Soybeans provide nitrogen
• Second yr. corn has lower yield than first yr.
• Implications for corn: disease build-up?
• Asian rust, nematodes, SB diseases pushing bean acres to corn
...and justice for all
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