Fundamental Analysis for Grain
By Dr. Robert Wisner
University Professor Emeritus
Iowa State University

Texas A & M University Master Marketers Conference, Waco, Texas, January 26, 2011

- The process of analyzing supply and demand, developing price forecasts
Objectives

• Illustrate some key tools of grain price forecasting

• Explain the role of fundamental analysis in marketing

• Show our current outlook for corn, soybeans, & wheat – 2011 & 2012 crops

• Some longer-term developments
Marketing Plan Fundamentals

• Start early
• Know *your* cash-flow costs & *risk bearing* ability
• You can’t go broke taking a profit
• Very often, the best corn & SB pricing opportunities are during Jan.-May before harvest. Consider puts @ planting time
• Use revenue insurance as companion to pre-harvest pricing, not substitute
• Be cautious with complicated new contracts
• Understand basis & storage costs
• *Use fundamental analysis as mktg. guide*
2008-09

LOOKOUT AHEAD

LOOKOUT!
Today’s Risk Environment

• Uncertain U.S. Dollar & Weather
• Global Biofuels – large new Demand
• Low World Grain Reserves
• Newer Risk-Management Tools
• Uncertain Govt. Payments
• Insurance: a companion tool for mktg.
• Reduced World Competition
Topics to Be Discussed

- Processes for Grain Supply-Demand Analysis
  - Old-crop & new-crop
- U.S. Ethanol Trends & Effects on Global Feed Supply-Demand
- USDA & other information sources
- Key Players in World Grain & Feed Trade
- Emerging Developments in China’s Grain
- The Future: Potential Areas for increased Crops
  - South America
  - Former Soviet Republics
  - China Corn?
Fundamental Analysis

- Balance Sheets – A Key Concept
- Analyzing Export Demand
- Analyzing Domestic Demand
- Analyzing Potential Supply
- S-D, Carryover & price relationships
- Seasonality
- Some Key Web Sites
- Current Examples
Why Forecast?

Market Risks are large
Business Decisions: based on committed & expected future costs & returns
• Crop acreage mix depends on prices
• How much N to put on corn
• Sell @ harvest, store into summer?
• Contract for harvest or later delivery?

Base decisions on hunch or best available information?
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
Fundamental vs. Technical Analysis

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

- *In the short run, markets over react & deviate from fundamentals, but supply & demand ultimately rule the market*
Objectives in This Session

- Not to make you expert forecasters
- Understand how good forecasts are made
- Understand limitations of forecasts
- Identify good information sources
- Provide guides to help anticipate market reactions
- Update on grain outlook for 2011-12 & how outlook was developed
Forecasting Rules

- Search for the **big picture**
- New-crop futures markets are **not** good forecasters
- *Never say always or never*
- If you forecast, forecast often
- Have a good historical perspective
- **Be a contrarian:** majority of traders is often wrong
- Respect market trends
- Inflation seldom increases corn & bean prices (but may via oil & $)
The U.S. Corn/Soybean Belt

Look @ big picture on crop size, not just your own area.

81% of U.S. corn & 85% of soybeans are grown outside Iowa.
World Feed Grain Production, Use, Carryover & Months of Reserve Supply Beyond Pipeline Needs
U.S. Corn Carryover Stocks in Weeks Supply
Corn Futures Open Interest vs Corn Price

USDA Oct report draws in speculative buying between $5.60 and $5.80

Specs add 126,000 longs above $5.80 level, 60,000 of them above $6.00

the bulge in Open interest ended badly... Longs dump 150,000 contracts from $5.35 to $5.25
NET Futures Positions in Com: Commercials vs Large Spec Traders

(Futures Only)

Large Specs

Commercials

Large Traders add 82,000 contracts to net long position during Dec

prepared by Quiet using CFTC data

Nov-08  Jun-09  Dec-09  Jun-10  Jan-11
U.S. Soybeans, Weeks Supply

Weeks Reserve Supply

Soybean Prices Received by Farmers & Weeks Carryover Supply, 2000 to Proj. 2012

$ per Bu.

$14.00

$12.00

$10.00

$8.00

$6.00

$4.00

$2.00

$0.00

0.00

2.00

4.00

6.00

8.00

10.00

Weeks Carryover Supply

2005

2006
U.S. Wheat Carryover Stocks, Weeks' Supply

Not as tight as corn & sb
Wheat Prices Received by Farmers & Carryover % of Use, 2000 to Proj. 2012

$ per Bu.

$8.00
$7.00
$6.00
$5.00
$4.00
$3.00
$2.00
$1.00
$0.00

0.0% 10.0% 20.0% 30.0% 40.0% 50.0% 60.0%

Weeks Carryover Supply

2009-10
World Wheat & Coarse Grain Area: Another 1996?
South American Soybean Production

La Niña

Total non-U.S. -287 mil. Bu. vs. '09-'10

Argentina
Brazil
Paraguay
Other non-U.S.
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 CONSIDERATIONS: GRAIN

- Price influenced by supply, demand, & competing products S-D (wheat)
- Prices influenced by current & expected future conditions
- Grain is a global Market
- Weather: a major supply factor
- Government policy: U.S. & foreign: EU biodiesel tax example
Demand: Two dimensions

Price

Quantity

Demand shift
Price Elasticity of Demand

• How quantity demanded changes with price

• Mathematical expression:
  % change in Quantity with a 1% change in price

• Price flexibility: 1/elasticity (price impact with supply change)
Which will cause greatest price decline? D or D-1?
Inelastic Demand

Is elasticity of D for corn changing?
Corn Elasticity of Demand

- Percent change in Quantity demanded with one percent change in Price
  - Corn: formerly -.5% (this may now be -.2)
  - Soybeans: -.4% (this may now be -.25)
  - Or 1% chg. in corn $S = 5\%$ chg. in price
  - 1% chg. in SB $S = 4\%$ chg. in price
  - *With all other market factors unchanged*
Mandated level of ethanol blending

Demand

Corn Price, $/ bu.

5,360 (2015 mandate)

Mil. Bu. Corn Processed into Ethanol

Demand for U.S. Corn for ethanol With Mandates
GHG Emissions Also a Big Issue

2007 U.S. Energy Act Biofuels Mandates

Mandates = Minimum ethanol blending volume
The Blending Wall: Ethanol Mandates in Billion Gallons Beyond the E-10 Market

E-15: a solution to the blending wall?

Current U.S. Ethanol Markets: E-10 & E-85
Figure 3. Mil. Tons Global Coarse Grain Exports & U.S. Corn Use for Fuel Ethanol

Corn for Ethanol With Govt. Mandate

Global Coarse Grain Exports

USDA 1/12/11

Net U.S. Corn Use for Ethanol After DDGS Credit
41 Countries Encourage Biofuels

Ethanol, demand growth & food inflation shifting China from to corn exporter to importer?
Three Grain Price Forecasting Methods

1. Carryover percent of total use
2. Computer forecasting model
3. Price flexibility based on elasticity of demand
U.S. Corn Price & Carryover in Weeks Supply

5 weeks supply or less: price influenced by ethanol price

Dynamic Ethanol Market

1987

1988-89: Reserve Trigger Release Required

2006-07

2009-10

2007-08

2008-09

Proi. 2010-11
Forecasting with price flexibilities

• Percent change in ’10-1 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
R. Wisner

Updated: 1/12/2011

Table 1. Corn Balance Sheet

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<td>Low</td>
<td>Med.5/</td>
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<td>Low</td>
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<td>Yield (bu. per acre)</td>
<td>149.1</td>
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<tr>
<td>Long-term Historical Yield Probability:</td>
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<td>18%</td>
<td>65%</td>
<td>17%</td>
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</table>

Supplies:

- Planted acres (million) 78.3 93.5 86.0 86.4 88.2 91.5 91.5 92.0
- Harvested acres (million) 70.6 86.5 78.6 79.5 81.4 83.9 84.5 85.0
- Production (mil. bu.) 10,535 13,038 12,092 13,092 12,447 12,753 13,689 14,280
- Beginning carryover (mil. bu.) 1,967 1,304 1,624 1,673 1,708 715 715 715
- Total Supply (incl. imports) 12,514 14,362 13,729 14,774 14,165 13,485 14,415 15,005
- Total Usage: (mil. bu.) 5,598 5,913 5,246 5,140 5,125 4,500 5,050 5,125
- Ethanol 2,117 3,049 3,677 4,568 4,925 4,925 5,025 5,035 5,050 5,100 5,175
- Food, ind. & seed 1,371 1,338 1,276 1,371 1,375 1,375 1,380 1,380 1,380 1,385 1,385
- Exports 2,125 2,437 1,858 1,987 2,025 2,025 2,125 2,150 1,900 1,950 2,000
- Total Usage 11,210 12,737 12,056 13,066 13,450 12,825 13,580 13,690 12,830 13,535 13,710
- Ending Carryover: (mil. bu.) 1,304 1,624 1,673 1,708 715 660 835 1,315 860 1,185 1,585

Carryover, weeks of total use 6.0 6.6 7.2 (6.8) (2.9) 2.7 (3.2) 6.0 3.6 4.6 2.0

Prices:

<table>
<thead>
<tr>
<th></th>
<th>U.S. weighted avg. farm price</th>
<th>Iowa weighted avg. farm price</th>
<th>Counter-cyclical pmt.</th>
<th>Harvest price (central Iowa)</th>
<th>Dec. futures price (harvest avg.)</th>
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<td>$2.80</td>
<td>$3.15</td>
<td>1.40</td>
<td>2.12</td>
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<td>$4.20</td>
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<td>$3.30</td>
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<td>$4.06</td>
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<td>$3.55</td>
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<td>$3.60</td>
<td>$3.95</td>
<td>1.73</td>
<td>2.70</td>
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Wheat Price


Assignment:

Insert your forecasts of 2010-11 U.S. weighted avg. farm prices for corn.

U.S. supply chg. vs 2009-10

Plus S. American crop chg.

Plus demand change

Effective S equiv. chg.

Effective S equiv. chg. % of 2009-10 total supply

Forecast Price: above % chg. (Times 5 ) (times 2009-10 price):
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<td>162.0</td>
<td>168.0</td>
<td>153.0</td>
<td>164.2</td>
<td>170.0</td>
<td>18%</td>
<td>17%</td>
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<td>Long-term Historical Yield Probability:</td>
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<td>Supplies:</td>
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<tr>
<td>Planted acres (million)</td>
<td>78.3</td>
<td>93.5</td>
<td>86.0</td>
<td>86.4</td>
<td>88.2</td>
<td>91.5</td>
<td>91.5</td>
<td>92.0</td>
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<td>91.5</td>
<td>92.0</td>
<td>83.9</td>
<td>84.5</td>
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<tr>
<td>Harvested acres (million)</td>
<td>70.6</td>
<td>86.5</td>
<td>78.6</td>
<td>79.5</td>
<td>81.4</td>
<td>83.9</td>
<td>84.5</td>
<td>85.0</td>
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<td>12,387</td>
<td>13,875</td>
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<tr>
<td>Beginning carryover (mil. bu.)</td>
<td>1,967</td>
<td>1,304</td>
<td>1,624</td>
<td>1,673</td>
<td>1,708</td>
<td>715</td>
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<tr>
<td>Total Supply (incl. imports)</td>
<td>12,514</td>
<td>14,362</td>
<td>13,729</td>
<td>14,774</td>
<td>14,165</td>
<td>13,485</td>
<td>14,415</td>
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<td>13,690</td>
<td>14,720</td>
<td>15,295</td>
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<td>Total Usage: (mil. bu.)</td>
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<td>Feed &amp; residual</td>
<td>5,598</td>
<td>5,913</td>
<td>5,246</td>
<td>5,140</td>
<td>5,125</td>
<td>4,500</td>
<td>5,050</td>
<td>5,125</td>
<td>4,500</td>
<td>5,100</td>
<td>5,175</td>
<td>4,500</td>
<td>5,100</td>
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<td>Ethanol</td>
<td>2,117</td>
<td>3,049</td>
<td>3,677</td>
<td>4,568</td>
<td>4,925</td>
<td>4,925</td>
<td>5,025</td>
<td>5,035</td>
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<td>5,150</td>
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<td>5,100</td>
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<tr>
<td>Food, ind. &amp; seed</td>
<td>1,371</td>
<td>1,338</td>
<td>1,276</td>
<td>1,371</td>
<td>1,375</td>
<td>1,375</td>
<td>1,380</td>
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<td>1,385</td>
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<td>Exports</td>
<td>2,125</td>
<td>2,437</td>
<td>1,858</td>
<td>1,987</td>
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<td>13,690</td>
<td>12,830</td>
<td>13,535</td>
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<td>13,535</td>
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<td>1,708</td>
<td>715</td>
<td>660</td>
<td>835</td>
<td>1,315</td>
<td>860</td>
<td>1,185</td>
<td>1,585</td>
<td>860</td>
<td>1,185</td>
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<td>Carryover, weeks of total use</td>
<td>6.0</td>
<td>6.6</td>
<td>7.2</td>
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<td>5.0</td>
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<td>Iowa weighted avg. farm price</td>
<td>$2.99</td>
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<td>$3.50</td>
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<td>Counter-cyclical pmt.</td>
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<tr>
<td>Harvest price (central Iowa)</td>
<td>$2.80</td>
<td>$3.30</td>
<td>$3.50</td>
<td>$3.60</td>
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<td>Dec. futures price (harvest avg.)</td>
<td>$3.15</td>
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<tr>
<td>Wheat/Corn Price Ratio</td>
<td>1.40</td>
<td>1.54</td>
<td>1.67</td>
<td>1.37</td>
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<tr>
<td>Soybean/corn price ratio</td>
<td>2.12</td>
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<td>Wheat Price</td>
<td>4.26</td>
<td>6.48</td>
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Assignment:

Insert your forecasts of 2010-11 U.S. weighted avg. farm prices for corn.

U.S. supply chg. vs 2009-10 -609
Plus S. American crop chg. -173
Plus demand change -339
Effective S equiv. chg. -1121

Effective S equiv. chg. % of 2009-10 total supply -0.076

Forecast Price: above % chg. (Times 5 ) (times 2009-10 price): $4.90
Forecasting with corn price flexibility (Price Elasticity -.2)

- 2010-11 corn supply - 609 mil. bu.
- Adjustment for demand growth
  - Feed & residual use -15 mil. bu.
  - Processing +357 mil. bu.
  - Exports +38
- Adjusted supply chg. -1121 mil. Bu. or -7.6%
- Forecast: 7.6% x 5 = +38% price impact
- Price forecast: $3.55 x 1.38 = $4.90 U.S. avg./bu. ('10-11 mkt. yr.)
- *My forecast in balance sheet is adjusted up for 2011 acreage battle: corn, wheat, cotton & soybeans*
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<td><strong>Long-term Historical Yield Probability:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
<td>65%</td>
<td>17%</td>
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<tr>
<td><strong>Supplies:</strong></td>
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<tr>
<td>Planted acres (million)</td>
<td>78.3</td>
<td>93.5</td>
<td>86.0</td>
<td>86.4</td>
<td>88.2</td>
<td>91.5</td>
<td>91.5</td>
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<tr>
<td>Harvested acres (million)</td>
<td>70.6</td>
<td>86.5</td>
<td>78.6</td>
<td>79.5</td>
<td>81.4</td>
<td>83.9</td>
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<tr>
<td>Production (mil. bu.)</td>
<td>10,535</td>
<td>13,038</td>
<td>12,092</td>
<td>13,092</td>
<td>12,447</td>
<td>12,753</td>
<td>13,689</td>
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<tr>
<td>Beginning carryover (mil. bu.)</td>
<td>1,967</td>
<td>1,304</td>
<td>1,624</td>
<td>1,673</td>
<td>1,708</td>
<td>740</td>
<td>740</td>
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<tr>
<td>Total Supply (incl. imports)</td>
<td>12,514</td>
<td>14,362</td>
<td>13,729</td>
<td>14,774</td>
<td>14,165</td>
<td>13,510</td>
<td>14,440</td>
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<tr>
<td><strong>Total Usage: (mil. bu.)</strong></td>
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<tr>
<td>Feed &amp; residual</td>
<td>5,598</td>
<td>5,913</td>
<td>5,182</td>
<td>5,140</td>
<td>5,125</td>
<td>4,460</td>
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<td>Ethanol</td>
<td>2,117</td>
<td>3,049</td>
<td>3,709</td>
<td>4,568</td>
<td>4,925</td>
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<td>Food, ind. &amp; seed</td>
<td>1,371</td>
<td>1,338</td>
<td>1,316</td>
<td>1,371</td>
<td>1,375</td>
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<td>Exports</td>
<td>2,125</td>
<td>2,437</td>
<td>1,849</td>
<td>1,987</td>
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<td>2,025</td>
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<td>Total Usage</td>
<td>11,210</td>
<td>12,737</td>
<td>12,056</td>
<td>13,066</td>
<td>13,425</td>
<td>12,785</td>
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<tr>
<td>Ending Carryover: (mil. bu.)</td>
<td>1,304</td>
<td>1,624</td>
<td>1,673</td>
<td>1,708</td>
<td>740</td>
<td>725</td>
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<td>Carryover, weeks of total use</td>
<td>6.0</td>
<td>6.6</td>
<td>7.2</td>
<td>6.8</td>
<td>2.9</td>
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<td>3.2</td>
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<td><strong>Prices:</strong></td>
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<tr>
<td>U.S. weighted avg. farm price</td>
<td>$3.04</td>
<td>$4.20</td>
<td>$4.06</td>
<td>$3.55</td>
<td>$5.50</td>
<td>$6.50</td>
<td>$5.50</td>
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<td>Iowa weighted avg. farm price</td>
<td>$2.99</td>
<td>$4.15</td>
<td>$4.01</td>
<td>$3.50</td>
<td>$5.45</td>
<td>$6.45</td>
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<td>Counter-cyclical pmt.</td>
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<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
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<td>Harvest price (central Iowa)</td>
<td>$2.80</td>
<td>$3.30</td>
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<td>$3.60</td>
<td>$4.75</td>
<td>$6.15</td>
<td>$5.10</td>
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<td>Dec. futures price (harvest avg.)</td>
<td>$3.15</td>
<td>$3.80</td>
<td>$3.85</td>
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<td>$5.35</td>
<td>$6.75</td>
<td>$5.70</td>
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<tr>
<td>Wheat/Corn Price Ratio</td>
<td>1.40</td>
<td>1.54</td>
<td>1.67</td>
<td>1.37</td>
<td>1.18</td>
<td>1.12</td>
<td>1.13</td>
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<tr>
<td>Soybean/corn price ratio</td>
<td>2.12</td>
<td>2.40</td>
<td>2.46</td>
<td>2.70</td>
<td>2.18</td>
<td>2.31</td>
<td>2.45</td>
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<tr>
<td>Wheat Price</td>
<td>4.26</td>
<td>6.48</td>
<td>6.78</td>
<td>4.85</td>
<td>6.50</td>
<td>7.30</td>
<td>6.20</td>
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Actual and Forecast Corn Prices, RW Models, Based on 1980-81 to 2009-10 Data

- **Actual Corn Price**
- **Model IIIIR Forecast**
- **Model IV Forecast**

Wisner Projections 1/6/11
Key Forecasting Variables

- Exports/total supply
- Ethanol/total use
- Corn Price lagged one year
- 0/1 weather variable for drought/flood years
- Wheat price lagged one year (Model IIIR)
- Current wheat price (Model IV)

- $R^2$ Model IIIR = .9044: All Var. Significant @ <6% probability except lagged wheat price
- $R^2$ Model IV = .9244: All Var. Significant @ <6%. Least significant is lagged corn price (All others significant at <1%)
Total 11,693 mil. Bu.

- In Operation: 5,432 MGY, 1,940.1 Mil Bu
- Under Expansion: 263 MGY, 93.9 Mil Bu
- Under Construction: 4,872 MGY, 1,740.0 Mil Bu
- Ground Broken: 2,463 MGY, 879.6 Mil Bu
- Planned: 19,710 MGY, 7,039.3 Mil Bu

Plants "Under Construction" have broken ground and have poured concrete. Plants that have "broken ground" have begun site work but no actual construction. Plants that are "planned" have been talked about or announced in the news.

1/26/2007
Percent Change in U.S. Corn Price & Corn Processing for Ethanol, 1981-2008

Nearly Inelastic Demand?
ETHANOL GROSS MARGIN*

*Gross Margin: Inputs: nearby corn futures/basis and nearby natural gas futures + 45 Outputs: DDGS (75% of cash corn) and ethanol nearby swaps with the western corn belt @ 12 under Chicago and eastern corn belt @ Chicago price.

Estimated expenses before depreciation=$.38/gal
Percent Change in U.S. Corn Price & % Deviation of Domestic Corn Feeding from Trend, 1981-2008

17% rise in price to get 5% cut in feeding

Implied price elasticity @ mean, 1995-06 = -.29
Elasticity, 1981-1994 @ mean = -.69
Changing corn market

Relative Shares of Major Uses of U.S. Corn in 2000-01

- Feed & Residual
- Exports
- Food, Industrial & Seed

Big swing factor in markets was export demand
Changing corn market

Relative Shares of Major Uses of U.S. Corn in 2004-05

- Exports
- Food, Industrial & Seed
- Feed & Residual
Changing corn market

Relative Shares of Major Uses of U.S. Corn in 2008-09

- Exports
- Food, Industrial & Seed
- Feed & Residual
Changing corn market

Relative Shares of Major Uses of U.S. Corn, Projected 2010-11

What’s ahead in next 5 years?
Cap & trade, GHG, animal agriculture, weather?
<table>
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<tr>
<th>Month</th>
<th>Price</th>
<th>Carry</th>
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<td>March 2011</td>
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<td>May</td>
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<tr>
<td>July</td>
<td>6.58</td>
<td>0.14</td>
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<tr>
<td>Sept.</td>
<td>6.05</td>
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<tr>
<td>Dec.</td>
<td>5.69</td>
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<tr>
<td>March 2012</td>
<td>5.75</td>
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<tr>
<td>May</td>
<td>5.92</td>
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<tr>
<td>July</td>
<td>5.88</td>
<td>0.19</td>
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<td>Sept.</td>
<td>5.49</td>
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<tr>
<td>Dec.</td>
<td>5.26</td>
<td></td>
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</tbody>
</table>

R.W. normal weather forecasts 5.70

.14 cent carry to July 2010

5.80
Error in USDA May Corn Forecasts for next season, Mid-Point of Prices

2010: $1.80 too low?

Forecast too high 45% of years, exact 7% of years, too low 48%, Avg. Error $0.02

Large neg.: short crop

Above zero = forecast too high

Error in USDA Nov. Corn Price Forecasts for next season, Mid-Point of Prices

Forecast too low 28% of time, too high 44% of years, Exact 28% of years. Avg. Error -$0.02 (too low)

2009: $1.35 too low

Above zero = forecast too high

Forecasting the New Crop Size
Key information sources

• USDA late March planting intentions report
• Weekly crop progress & condition reports
• Weather forecasts, weekly, monthly & other
• Monthly USDA crop forecasts – wheat: May to Sept., corn, milo, SB Aug. – Nov.
• Private forecasting reports
• Trend yields
Percent Change in U.S. Corn Plantings from Intentions Survey to Next January, 1965-2008

2009:+1.5 , 2010: -0.6

Avg. Chg. 1996-08: +0.3%
Highest Ylds. So far: 160.4 & 164.7

1990-2008 trend for 2011: 162.9
Figure 6. U.S. Corn Yield, Percent Deviation From Trend, 1866-2005

Yields > 8% above trend: 26% of years
Yields < 8% below trend: 15% of years

Note greater down-side extremes when 10% or more deviation from trend yld.
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
USDA Corn Yield Forecasts, Percent Change from September to Season Final Estimate

Avg. Change, All Years except major weather-stress years: +2.3%

Estimates increased in 71% of the years

* Major weather stress years
Biofuels have dramatically changed the level but not seasonality since 2005.
Risk Premium in Dec. Corn Futures
Mid-May vs. early Nov.

Past results are no guarantee of future performance.
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., 1975-2005

Prices Rose 32% of Years, **Declined 68%**. Avg. Decline, all years, = $0.26/Bu. (April) & $0.25 (May)

*Past results are no guarantee of future performance*
Forecasting U.S. Corn Yields

- **Yield**: The biggest uncertainty in the Supply-Demand equation
- **Corn Yield**: 5% below trend for 2011 would cut production 735 mil. Bu. below expected use
- **10%** above trend would put crop 1.32 bil. bu. Above expected use
- **Price implications**: Very Large & w/low yld., Explosive for all grains
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
Key Web Sites

- [http://www.nws.noaa.gov/](http://www.nws.noaa.gov/) National Weather Service weather reports, current, 6-10 days up to monthly and season outlook
- [http://www.econ.iastate.edu/faculty/wisner/grainbidlinks.docFutures](http://www.econ.iastate.edu/faculty/wisner/grainbidlinks.docFutures) Prices & cash prices at various locations
## Iowa Crop Progress as of July 5, 2009

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<th>Crop Item</th>
<th>Districts</th>
<th></th>
<th></th>
<th></th>
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<th>Average</th>
<th>State</th>
<th>Last Week</th>
<th>Last Year</th>
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<td>NC</td>
<td>NE</td>
<td>WC</td>
<td>C</td>
<td>EC</td>
<td>SW</td>
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<td>NE</td>
<td>WC</td>
<td>C</td>
<td>EC</td>
<td>SW</td>
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<td>Corn stand, % of Norm.</td>
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<td>NE</td>
<td>WC</td>
<td>C</td>
<td>EC</td>
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<td>Soybeans % blooming</td>
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Illinois has similar information.
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<th>Chg. Vs. %G-E</th>
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### Frost Concerns in 2009

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### Frost Impact?

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<td>WI</td>
<td>58</td>
<td>33</td>
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<td><strong>18 Sts.</strong></td>
<td><strong>74</strong></td>
<td><strong>57</strong></td>
<td><strong>84</strong></td>
<td><strong>92</strong></td>
</tr>
</tbody>
</table>

*Note: The table shows the corn percent mature for various states on different dates, with the 5-year average also provided.*
Brazil Precip. % of Normal
12/21-12/31/10

Major SB Areas
Precipitation % of Normal
Argentina, Uruguay
9/1-12/31/10

Major grain Areas

Decadal Percent of Normal (%)

- > 200
- 150 - 200
- 125 - 150
- 100 - 125
- 75 - 100
- 50 - 75
- <= 50
- No Data
What to Look For in Sources of Outlook Information

- Good detail on international conditions
- Use of sensitivity analysis & probabilities
- Up-to-date S-D
- Advisable to use several sources + USDA
- Technical analysis can supplement fundamental analysis
- Keys for 2010-11: U.S. crops, China, S. Am. crops, E-15
Wheat: world competition is strong

-- Adequate but reduced U.S. Carryover expected, world – sharper decline

-- Weather concerns in S. Plains & FSU

-- Soft red acres up sharply for 2010-11

-- Uncertain areas: China weather, 2011 world production
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<tr>
<td><strong>Area (Mil. A.)</strong></td>
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<tr>
<td>Planted</td>
<td>60.5</td>
<td>63.2</td>
<td>59.2</td>
<td>53.6</td>
<td>58.7</td>
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<td>Harvested</td>
<td>51</td>
<td>55.7</td>
<td>49.9</td>
<td>47.6</td>
<td>48.7</td>
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<td>Yield, Bu./A.</td>
<td>40.2</td>
<td>44.9</td>
<td>44.5</td>
<td>46.4</td>
<td>41.5</td>
<td>44.5</td>
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<td>Production, Mil. Bu.</td>
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<td>2,218</td>
<td>2,208</td>
<td>2,021</td>
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<td>Beginning stocks</td>
<td>466</td>
<td>306</td>
<td>657</td>
<td>976</td>
<td>792</td>
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<td>Imports</td>
<td>113</td>
<td>127</td>
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<td>2,993</td>
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<td>Food</td>
<td>948</td>
<td>927</td>
<td>917</td>
<td>930</td>
<td>935</td>
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<td>Seed</td>
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<td>78</td>
<td>69</td>
<td>76</td>
<td>80</td>
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<td>Feed and residual</td>
<td>16</td>
<td>255</td>
<td>150</td>
<td>170</td>
<td>150</td>
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<td>Domestic, total</td>
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<td>Exports</td>
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<td>881</td>
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<td>Use, total</td>
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<td>2,501</td>
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<td>657</td>
<td>976</td>
<td>792</td>
<td>618</td>
<td>733</td>
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<td>Weeks Supply</td>
<td>6.9</td>
<td>15.0</td>
<td>25.1</td>
<td>16.5</td>
<td>13.9</td>
<td>16.0</td>
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<td>Stocks/use</td>
<td>13.2%</td>
<td>28.9%</td>
<td>48.3%</td>
<td>31.7%</td>
<td>26.7%</td>
<td>30.7%</td>
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<td>Avg. farm price ($/bu)</td>
<td>$6.48</td>
<td>$6.78</td>
<td>$4.87</td>
<td>$5.80</td>
<td>$8.80</td>
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</table>
Historical

1/17/11

Price pushed up by corn, ethanol,$ weakness,
drop in foreign production in 2010

Proj. 2010-11

1/11/10

Proj. 2011-12

1/17/11

88
’10-Crop Export Sales Through 1/6/11

- **Soybeans:** 1,321 mil. Bu. + 9% from yr. ago.
  - 83% of USDA projected mkt. yr. exports
  - USDA October proj. expts. Low 7 of 10 yrs.

- **Corn:** 1,054 mil. bu. +4% from yr. ago

- **Wheat,** at 58% through mktg. yr.:
  - SRW: -10% vs. yr. ago
  - HRW: +99%
  - HRS: +90%
  - All wheat:+61%
  - USDA Projected for mktg. yr.: +48%
Do pre-harvest new-crop wheat prices have a risk premium?

• OSU & KSU research says no
• U. of Minn. Studies hint at a possible small one

• Wheat: fundamentally different than corn & SB
  – Harvesting nearly year around globally
  – U.S. much smaller share of global production than corn & SB
  – Somewhat more weather resistant than corn & SB
World Wheat & Coarse Grain Area: Another 1996?

Coarse Grains

Wheat

1996-97
## SB Balance Sheet

**Updated:** 2/8/2011

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<td><strong>Yield (bu. per acre)</strong></td>
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<td>41.7</td>
<td>39.7</td>
<td>44.0</td>
<td><strong>43.5</strong></td>
<td>41.0</td>
<td>43.3</td>
<td>45.5</td>
<td>41.0</td>
<td>43.9</td>
<td>45.5</td>
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<td><strong>Long-term historical yield probability:</strong></td>
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<td></td>
<td></td>
<td>65%</td>
<td>18%</td>
<td>65%</td>
<td>17%</td>
<td>18%</td>
<td>65%</td>
<td>17%</td>
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<td><strong>Supplies:</strong></td>
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<tr>
<td>Planting acres (million)</td>
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<td>75.7</td>
<td>77.5</td>
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<td>78.0</td>
<td>78.0</td>
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<tr>
<td>Harvested acres (million)</td>
<td>74.6</td>
<td>64.1</td>
<td>74.7</td>
<td>76.4</td>
<td>76.6</td>
<td>75.2</td>
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<td>76.7</td>
<td>77.0</td>
<td>77.0</td>
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<tr>
<td>Beginning carryover (mil. bu.)</td>
<td>449</td>
<td>574</td>
<td>205</td>
<td>138</td>
<td>151</td>
<td>120</td>
<td>120</td>
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<td>130</td>
<td>130</td>
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<td><strong>Usage:</strong></td>
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<tr>
<td>Crush (mil. bu.)</td>
<td>1,808</td>
<td>1,803</td>
<td>1,662</td>
<td>1,752</td>
<td>1,660</td>
<td>1,580</td>
<td>1,660</td>
<td>1,680</td>
<td>1,580</td>
<td>1,660</td>
<td>1,680</td>
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<tr>
<td>Seed &amp; residual (mil. bu.)</td>
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<td>93</td>
<td>101</td>
<td>108</td>
<td>115</td>
<td>148</td>
<td>122</td>
<td>133</td>
<td>130</td>
<td>122</td>
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<td>Exports (mil. bu.)</td>
<td>1,116</td>
<td>1,159</td>
<td>1,283</td>
<td>1,501</td>
<td>1,600</td>
<td>1,360</td>
<td>1,485</td>
<td>1,590</td>
<td>1,450</td>
<td>1,610</td>
<td>1,670</td>
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<tr>
<td><strong>Ending Soybean carryover (mil. bu.)</strong></td>
<td>574</td>
<td>205</td>
<td>138</td>
<td>151</td>
<td>120</td>
<td>130</td>
<td>130</td>
<td>160</td>
<td>130</td>
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<td>160</td>
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<td><strong>Carryover, weeks of total use</strong></td>
<td>9.7</td>
<td>3.5</td>
<td>2.4</td>
<td><strong>2.3</strong></td>
<td><strong>1.9</strong></td>
<td>2.2</td>
<td>2.1</td>
<td>2.5</td>
<td>2.1</td>
<td>2.0</td>
<td>2.4</td>
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<td><strong>Prices:</strong></td>
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<td>U.S. weighted avg. farm price</td>
<td>$6.43</td>
<td>$10.10</td>
<td>$9.97</td>
<td>$9.59</td>
<td>$12.00</td>
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<td>$14.75</td>
<td>$13.75</td>
<td>$11.50</td>
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<tr>
<td><strong>Soybean/corn price ratio</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<td>0.00</td>
<td>0.00</td>
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<td>Harvest price (central Iowa)</td>
<td>$5.45</td>
<td>$8.45</td>
<td>$8.50</td>
<td>$9.50</td>
<td>$10.50</td>
<td>$14.50</td>
<td>$13.00</td>
<td>$10.90</td>
<td>$14.20</td>
<td>$13.25</td>
<td>$10.90</td>
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<td>Nov. futures price (harvest avg.)</td>
<td>$6.05</td>
<td>$9.45</td>
<td>$9.10</td>
<td>$9.95</td>
<td>$11.30</td>
<td>$15.30</td>
<td>$13.70</td>
<td>$11.65</td>
<td>$15.00</td>
<td>$13.95</td>
<td>$11.65</td>
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<td>Soy meal, Decatur, $/T 48% protein</td>
<td>$205</td>
<td>$336</td>
<td>$331</td>
<td>$311</td>
<td>$359</td>
<td>$440</td>
<td>$390</td>
<td>$325</td>
<td>$440</td>
<td>$410</td>
<td>$325</td>
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<tr>
<td>Soy oil, $ per cwt.</td>
<td>$31.02</td>
<td>$52.03</td>
<td>$32.16</td>
<td>$35.95</td>
<td><strong>52.00</strong></td>
<td>$58.00</td>
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<td>$56.00</td>
<td>$53.00</td>
<td>$50.00</td>
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</tr>
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</table>
Using elasticity for SB forecast gives 2010-11 price at $13.70/bu.

- Corn price will support soybean price
- The two markets will create a balance of needed acreages in 2011
- Biodiesel demand may also be a factor since Congress renewed biodiesel tax credit
- Seasonality: SB supplies will be very tight in late summer
Soybean/Corn Price Ratio & Change in U.S. Soybean Planted Acres Selected Years

For needed 2011 acres, implies IA cash SB price @ about $14.70 in May
Seasonality of Soybean Product Prices, 1995-2007-08 Marketing Years

- **Soy Meal**
- **Soy Oil**

**Axes:**
- Y-axis: $ Per Ton, 44%, Decatur
- X-axis: Months (September - August)
- Right Y-axis: Cents/Lb. Soy Oil

Graph shows the price trends for Soy Meal and Soy Oil from September to August over the years 1995-2007-08.
Take-home Points: Fundamental Analysis

• Look at the big picture
• Demand elasticity is changing & making prices more sensitive to supply changes
• Typical approach uses balance sheets
• Price forecasts: typically based on stocks/use, forecasting models, and/or elasticity of demand
• Know where to get information: weather & crops, USDA reports, ethanol, international crop conditions
• Other related information is in next slides
Thanks!

Questions?

Web Sites

http://www.econ.iastate.edu/faculty/wisner/

http://www.agmrc.org/renewable_energy/agmrc_renewable_energy_energy_newsletter.cfm
Monthly U.S. $ Index to 12/31/09:
Linked closely to energy prices
& thus to grain markets
U.S. General Econ. Outlook

3 Highly Likely Developments

- Trend toward weaker $ 
- Increasing inflation, esp. in 2-3 years 
- Higher interest rates— in 2-3 years, possibly sooner

*Driving forces: huge budget deficits and “cap & trade”*
World Feed Trade Outlook

• 5 Keys to global feed trade: (1) *U.S. biofuels*, (2) U.S crop yields, (3) China, (4) FSU, (5) South America

• *Global warming: is it real?*

• Will reason prevail in policies?
  – impact of GHG emissions controls on economy, grain and animal production and trade?
Approximate Maximum Price Ethanol Plants to Pay for Corn with Varying Crude Oil Prices

Spot Crude 2/09/09

July ‘10 crude oil, 4/01/09

July ‘10 corn, 5/6/09

July 2010: $61.65, brings corn near $4.80/bu.
World Corn Exports by Source, 2007-08

U.S. Ethanol & Yield Trend Have Big Implications for Corn Exports
Sorghum Also is an Ethanol Feedstock
U.S., Foreign, and World Coarse Grain Exports

Data Source: USDA 3/12/09

- U.S. Exports
- World Exports
- Non-U.S.
China's Net Corn Exports, Marketing Years & USDA Projection for 2008-09

Bars above zero are exports, below indicate net imports
Corn Yield to Affect China Export Availability
Normal Yield: about 68-70% of U.S.
Southern Hemisphere Corn Exports
2008 crop down 17 mil. Tons or 670 mil. bu.
Net Grain Exports, Former Soviet Union, 1961-2008

Source of data: USDA, FAS, PSD & WAOB Projections

Million Bushels Corn Equivalent

Major World Protein Exports, 2007-08

- Soy Meal
- Rape
- Palm Kernel
- Meal Copra
- Meal Cottonseed
- Meal Fish
- Meal Peanut
- Meal Sunflowerseed
World Protein Meal Exporters, 2007-08

- Argentina
- Brazil
- U.S.
- India
- Indonesia
- Malaysia
- Canada
- Others
Major Protein Meal Consumers, 2007-08

- China
- EU
- Others
- U.S.
- Brazil
- India
- Japan
- Mexico
- S. Korea
- Indonesia
China Soybean Meal Use

Slower growth in the Future?

Mil. Metr. Tons


Marketing Years Beginning
Newly Cleared Land In Brazil
Planted to Upland Rice
Potential area to be cleared for crops

West Central Argentina, 2007
Four Key Areas to Influence Future Feed Exports

• U.S. -- Biofuels Policies & Crop Yields
  – Less restrictive GHG regulations?

• China
  – Will its SBM growth slow?
  – Will it be a corn importer?

• South America – can it continue to expand?

• Former Soviet Republics – political stability?
The Future

- Grain & oilseeds will be energy crops
- Cellulose crops will compete with other ag production
- Global grain demand will increase modestly, next 2 to 3 years as economy recovers
- China may be modest corn importer
- Non-U.S. feedstuff sources will gradually expand supplies
- U.S. will see significant crop yield increases, helping to supply biofuels growth
- Prices will be volatile