

Biofuel Impacts on Agriculture

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March 29, 2007

ISU Livestock Field Specialist Meeting

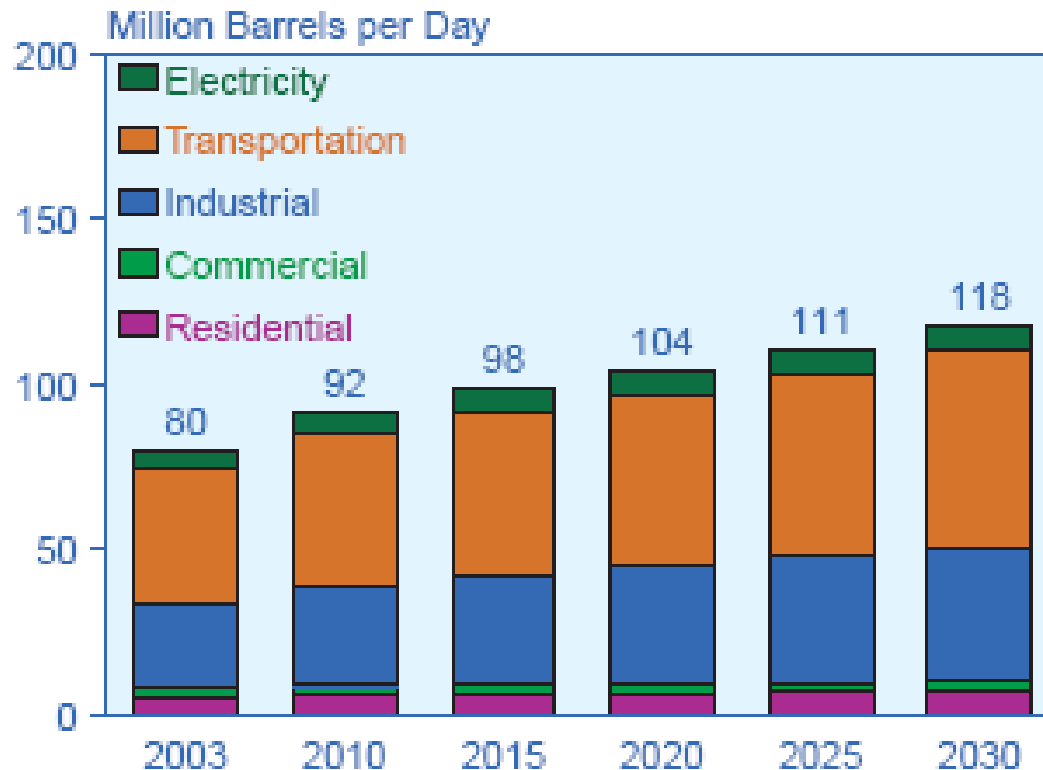
Ames, Iowa

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Projected World Oil Consumption

Figure 26. World Oil Consumption by Sector, 2003-2030

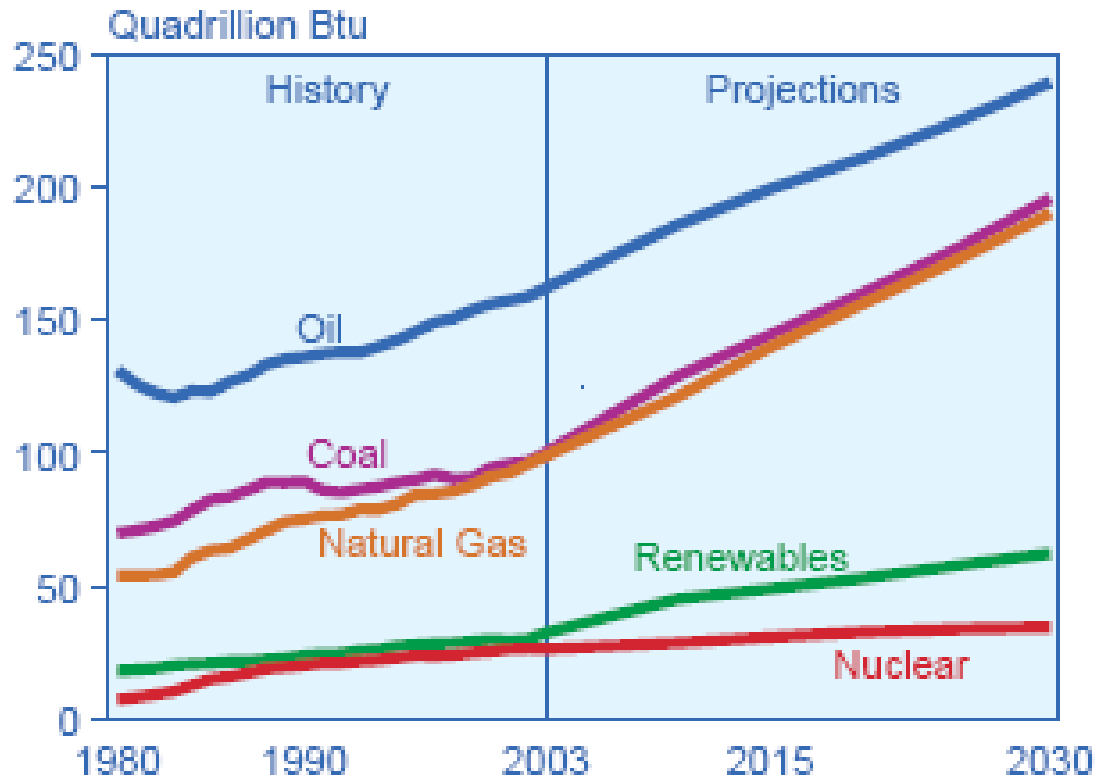


Sources: 2003: Derived from Energy Information Administration (EIA), *International Energy Annual 2003* (May-July 2005), web site www.eia.doe.gov/ieal. Projections: EIA, *System for the Analysis of Global Energy Markets* (2006).



Projected World Energy Sources

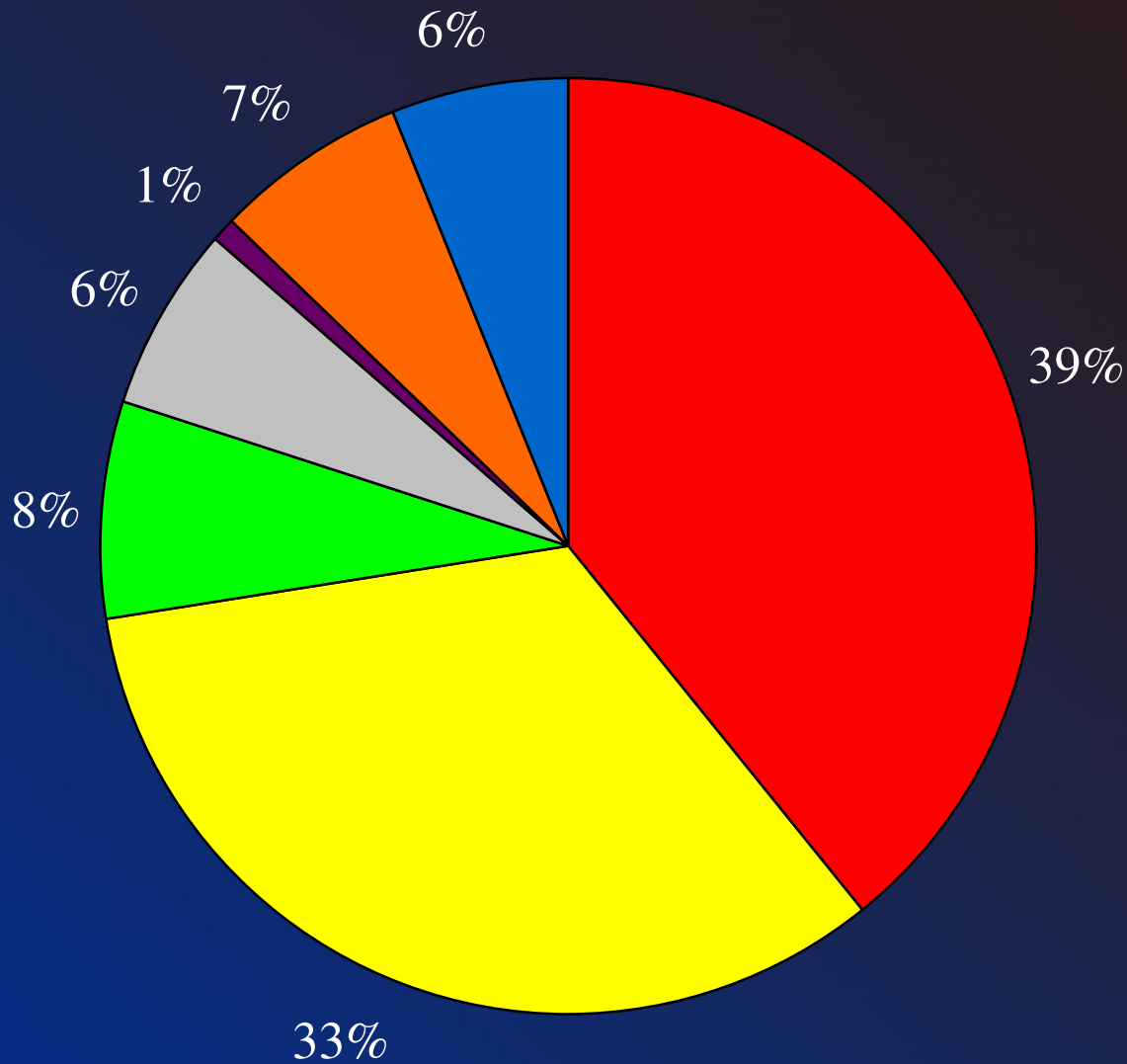
Figure 3. World Marketed Energy Use by Energy Type, 1980-2030



Sources: History: Energy Information Administration (EIA), *International Energy Annual 2003* (May-July 2005), web site www.eia.doe.gov/iea/. Projections: EIA, *System for the Analysis of Global Energy Markets* (2006).

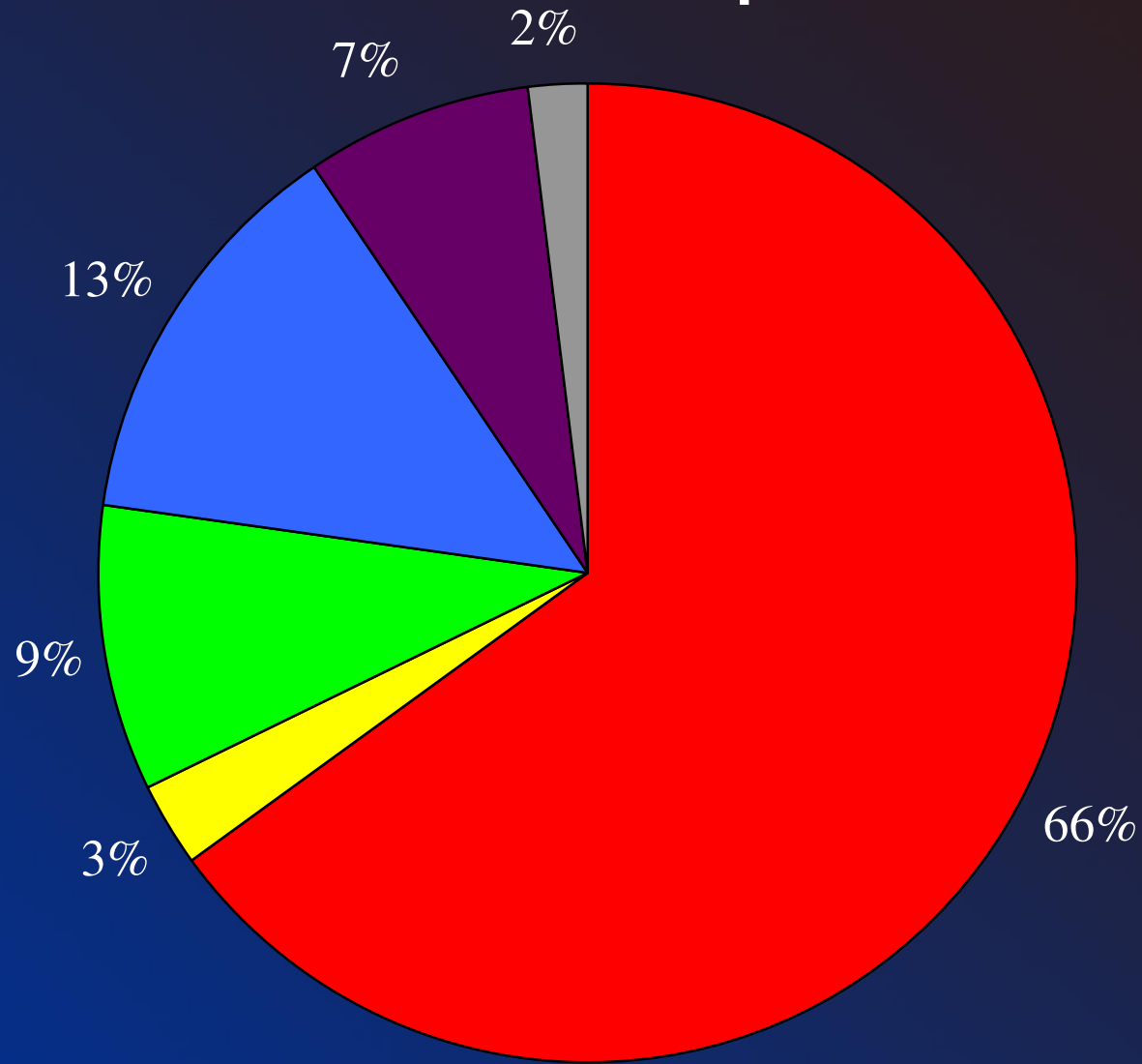


World Ethanol Production, 2006



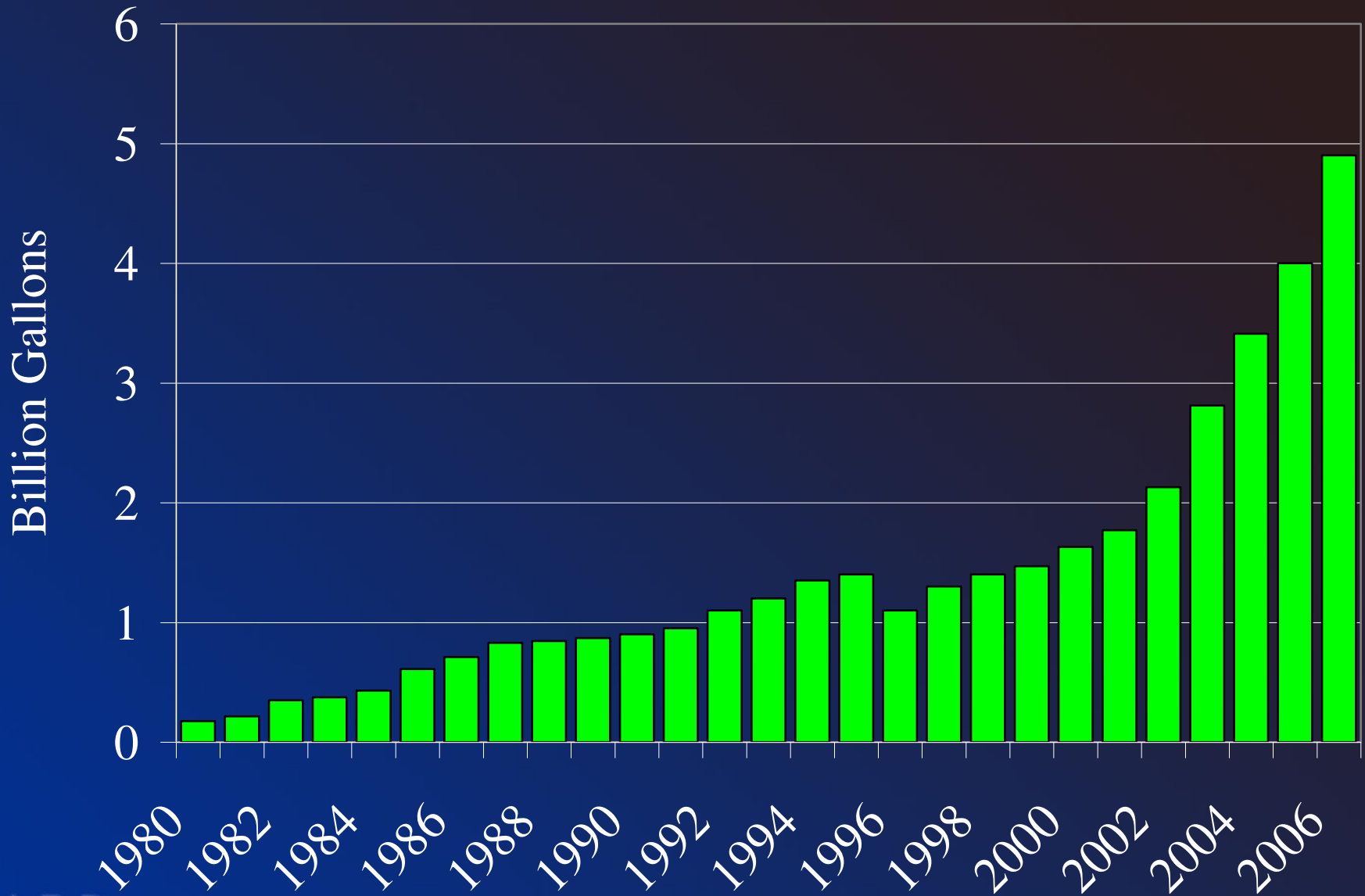
 ■ U.S. ■ Brazil ■ China ■ Europe ■ Africa ■ Asia ■ Rest of World

World Ethanol Imports, 2006



■ U.S. ■ EU ■ India ■ Japan ■ South Korea ■ Rest of World

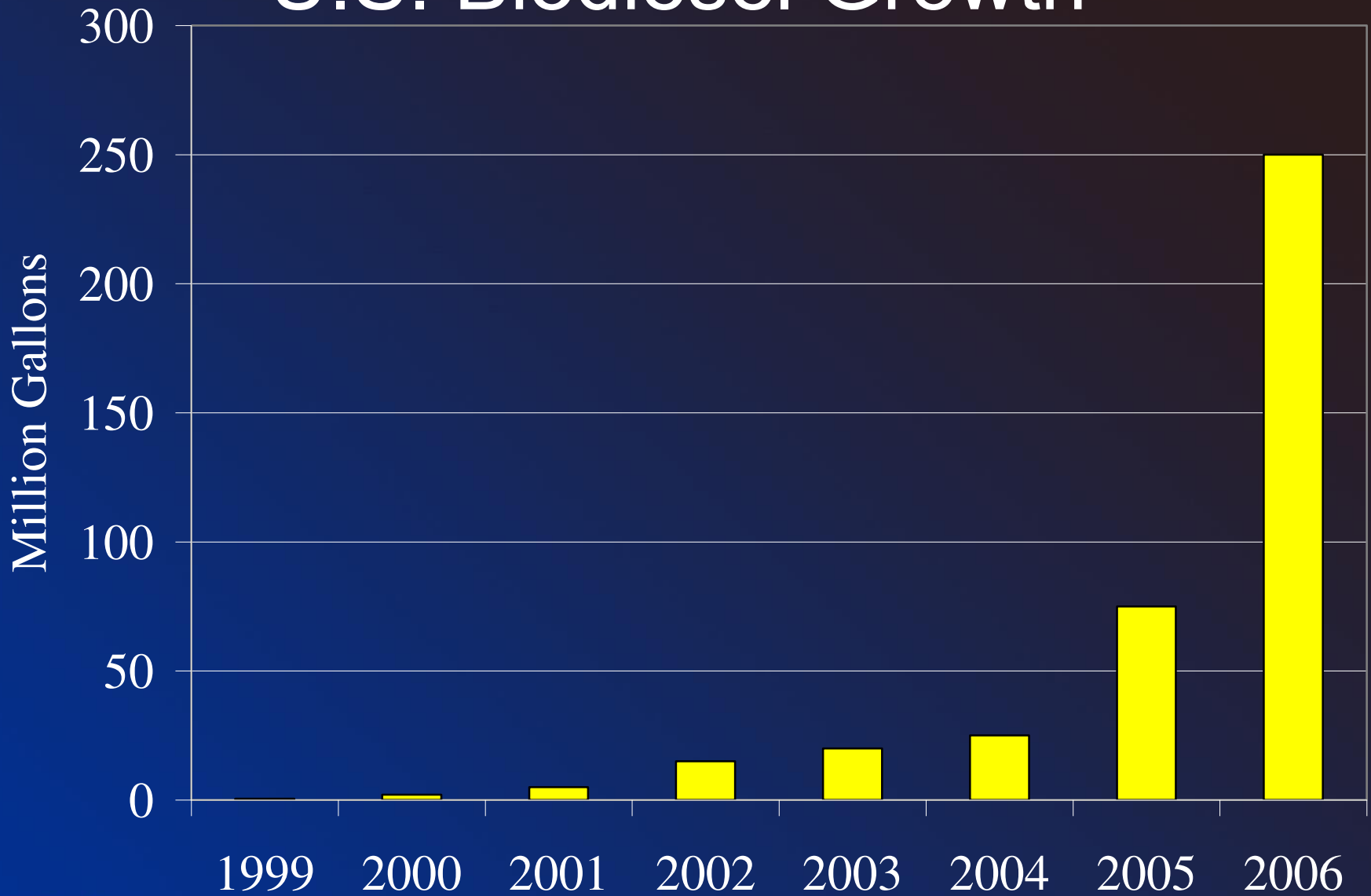
U.S. Ethanol Production



Source: Renewable Fuels Association



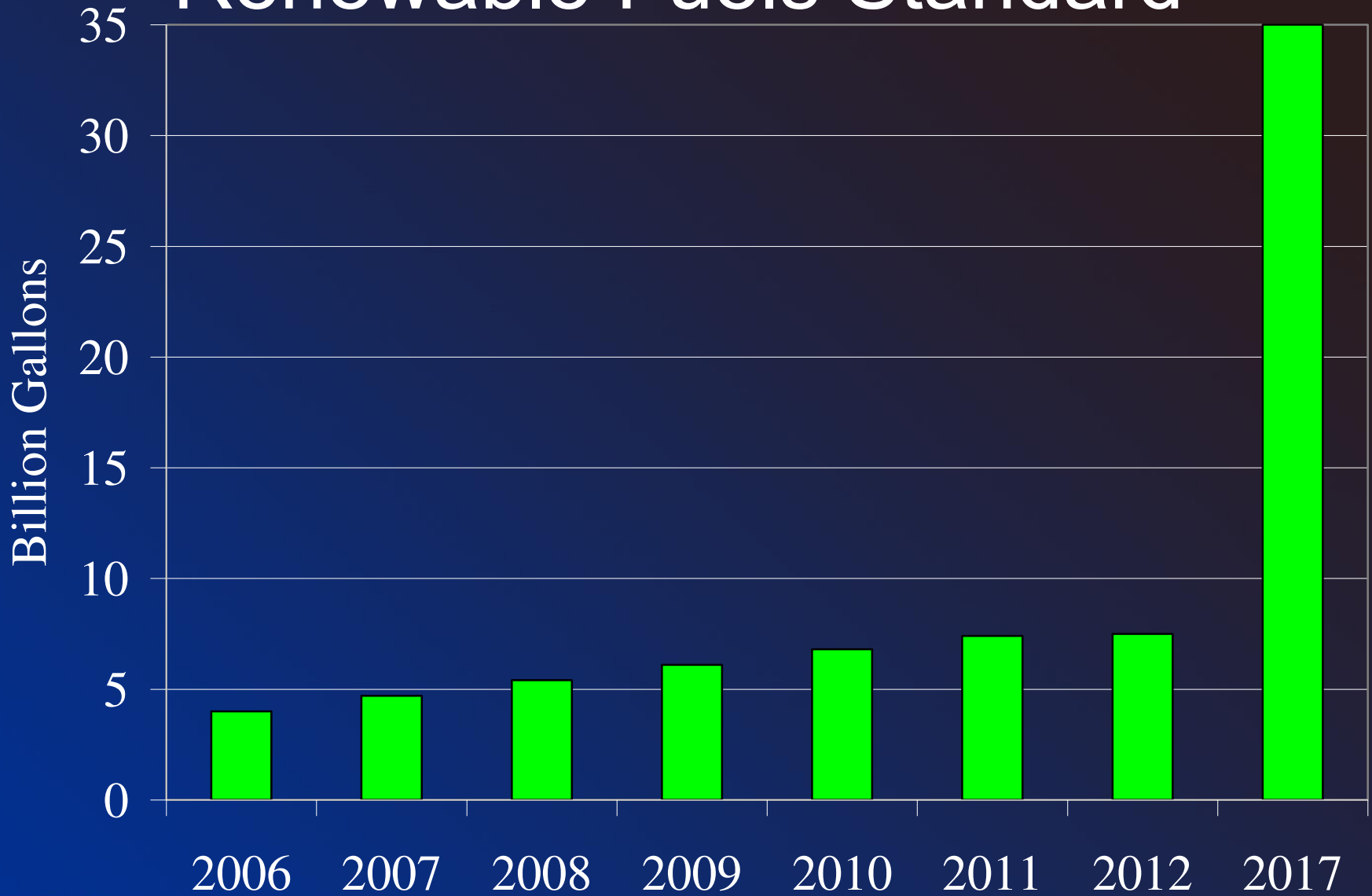
U.S. Biodiesel Growth



Source: National Biodiesel Board



Renewable Fuels Standard



Ethanol Industry Snapshots

| | Ethanol Plants | Capacity (mgy) |
|-----------|----------------|----------------|
| Jan. 2000 | 54 | 1,749 |
| Jan. 2001 | 56 | 1,921 |
| Jan. 2002 | 61 | 2,347 |
| Jan. 2003 | 68 | 2,707 |
| Jan. 2004 | 72 | 3,101 |
| Jan. 2005 | 81 | 3,644 |
| Jan. 2006 | 95 | 4,336 |
| Jan. 2007 | 110 | 5,386 |

Source: Renewable Fuels Association



Ethanol – State by State

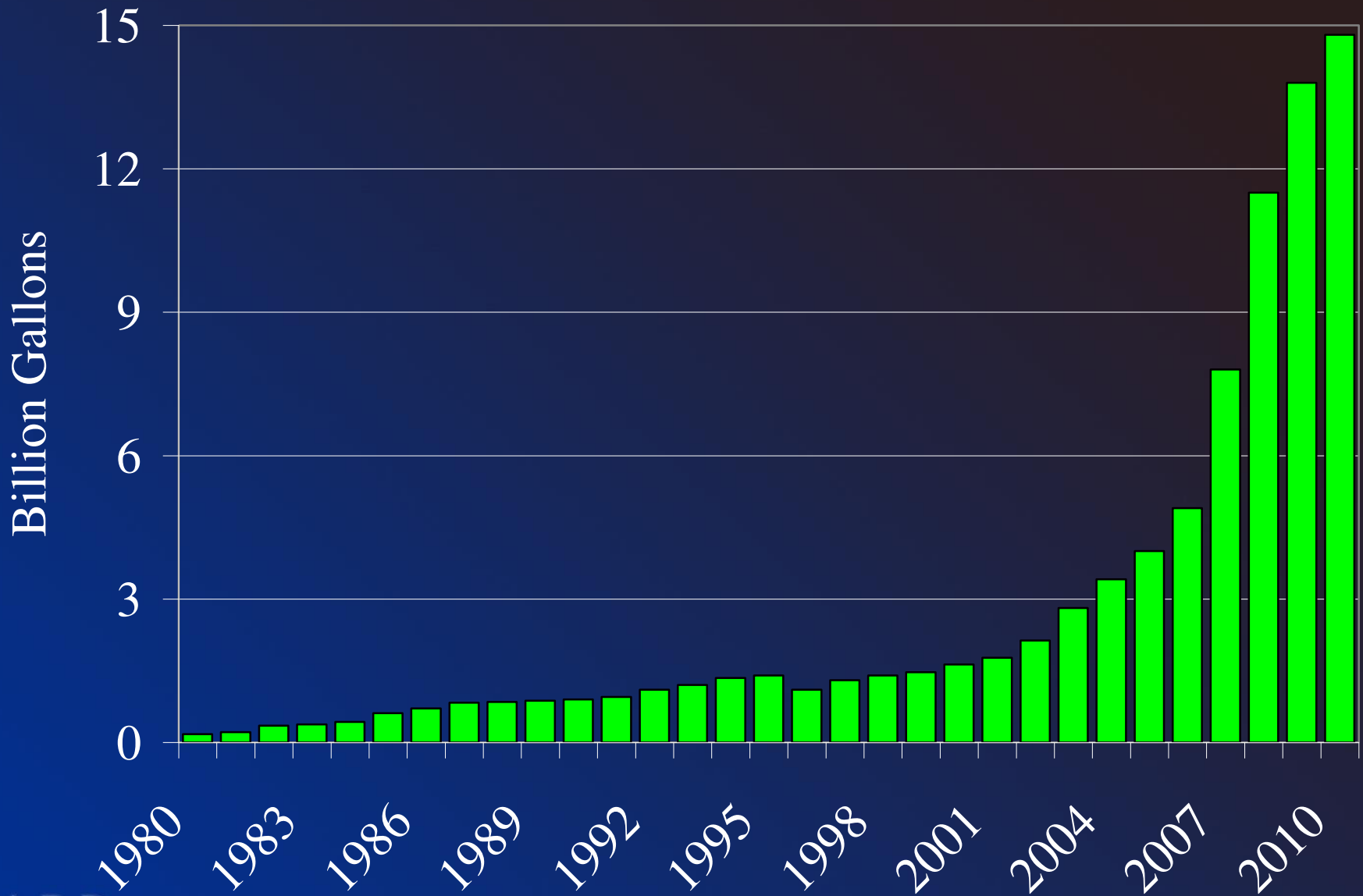
| State | Current Capacity (million gallons) |
|-------|---------------------------------------|
| IA | 1,706 |
| IL | 894 |
| NE | 681 |
| MN | 557 |
| SD | 555 |
| WI | 230 |
| KS | 211 |
| IN | 162 |
| MO | 155 |
| MI | 150 |
| ND | 134 |
| CO | 88 |
| CA | 69 |
| TN | 67 |
| KY | 35 |
| NM | 30 |
| WY | 10 |
| OH | 4 |
| FL | 4 |
| OK | 2 |
| GA | 1 |



Biodiesel – State by State

| State | Current Capacity (million gallons) |
|-------|---------------------------------------|
| TX | 143 |
| IA | 139 |
| IL | 66 |
| TN | 65 |
| MN | 63 |
| MO | 47 |
| OH | 39 |
| SC | 36 |
| CA | 36 |
| AL | 35 |
| AR | 27 |
| CO | 27 |
| NJ | 24 |
| OK | 23 |
| VA | 22 |
| FL | 22 |
| GA | 19 |
| IN | 15 |
| LA | 15 |
| MI | 15 |
| PA | 12 |

Continuing Ethanol Growth



Ethanol – State by State

| State | Current Capacity | Being Built (million gallons) | Total |
|-------|------------------|----------------------------------|-------|
| IA | 1,706 | 1,740 | 3,446 |
| NE | 681 | 1,424 | 2,105 |
| IL | 894 | 291 | 1,185 |
| MN | 557 | 451 | 1,008 |
| SD | 555 | 425 | 980 |
| IN | 162 | 687 | 849 |
| WI | 230 | 282 | 512 |
| KS | 211 | 295 | 506 |
| OH | 4 | 399 | 403 |
| TX | 0 | 370 | 370 |
| MI | 150 | 107 | 257 |
| ND | 134 | 100 | 234 |
| TN | 67 | 138 | 205 |
| NY | 0 | 164 | 164 |
| MO | 155 | 0 | 155 |
| OR | 0 | 143 | 143 |
| CO | 88 | 50 | 138 |
| GA | 1 | 100 | 101 |
| KY | 35 | 50 | 85 |
| CA | 69 | 0 | 69 |
| MS | 0 | 60 | 60 |
| AZ | 0 | 55 | 55 |
| WA | 0 | 55 | 55 |

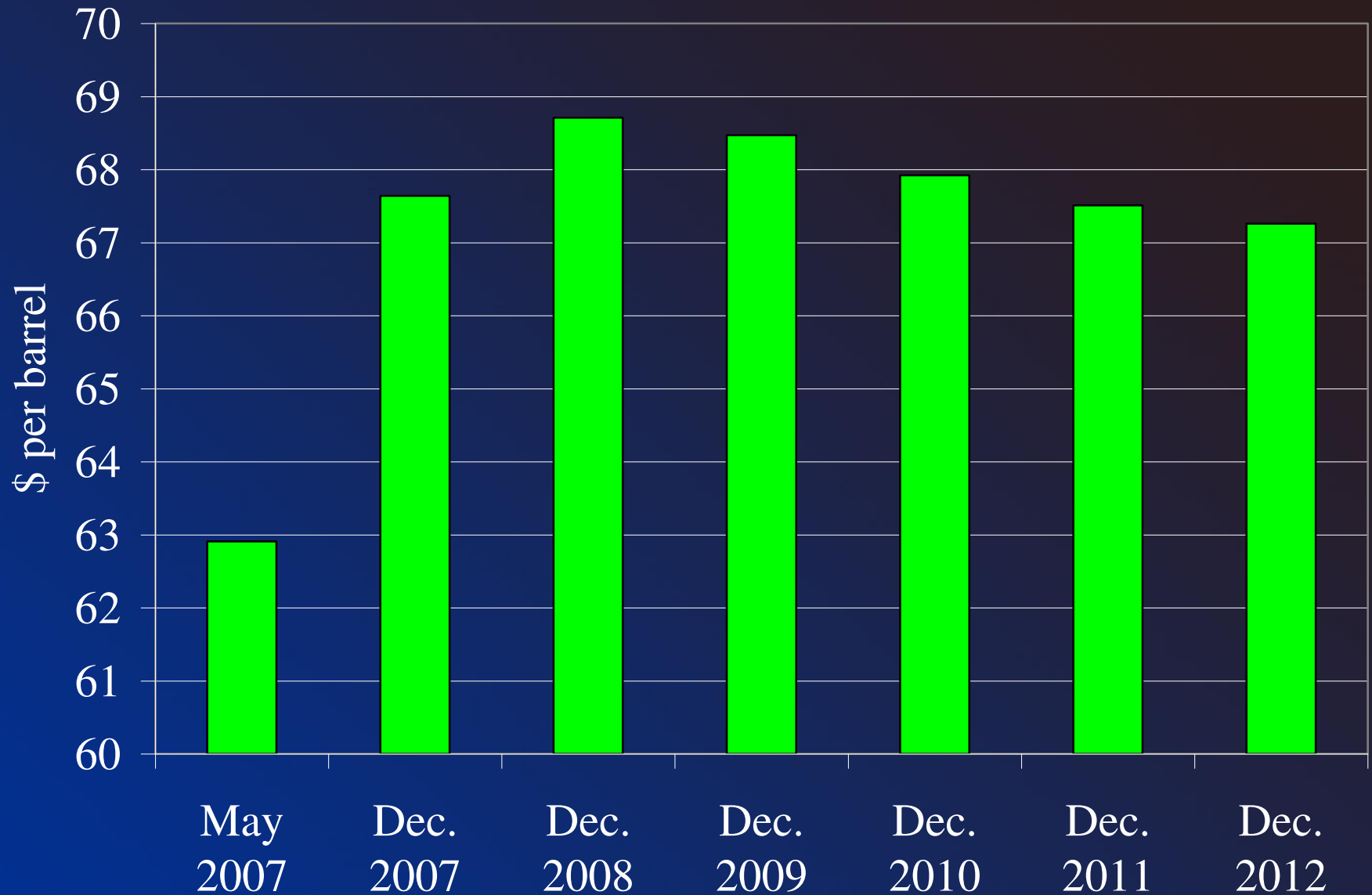


Biodiesel – State by State

| State | Current Capacity | Being Built (million gallons) | Total |
|-------|------------------|----------------------------------|-------|
| IA | 139 | 210 | 349 |
| TX | 143 | 164 | 307 |
| NJ | 24 | 150 | 174 |
| IL | 66 | 80 | 146 |
| IN | 15 | 120 | 135 |
| MO | 47 | 78 | 125 |
| ND | 0 | 117 | 117 |
| WA | 8 | 101 | 109 |
| MS | 9 | 99 | 108 |
| SC | 36 | 61 | 97 |
| WI | 1 | 83 | 84 |
| AR | 27 | 53 | 80 |
| TN | 65 | 13 | 78 |
| AL | 35 | 40 | 75 |
| NV | 6 | 60 | 66 |
| PA | 12 | 54 | 66 |
| OH | 39 | 26 | 65 |
| CA | 36 | 29 | 64 |
| MN | 63 | 0 | 63 |
| GA | 19 | 40 | 59 |
| KY | 7 | 50 | 57 |
| NE | 0 | 55 | 55 |
| OK | 23 | 31 | 54 |



Oil Futures As Of 3/27/2007



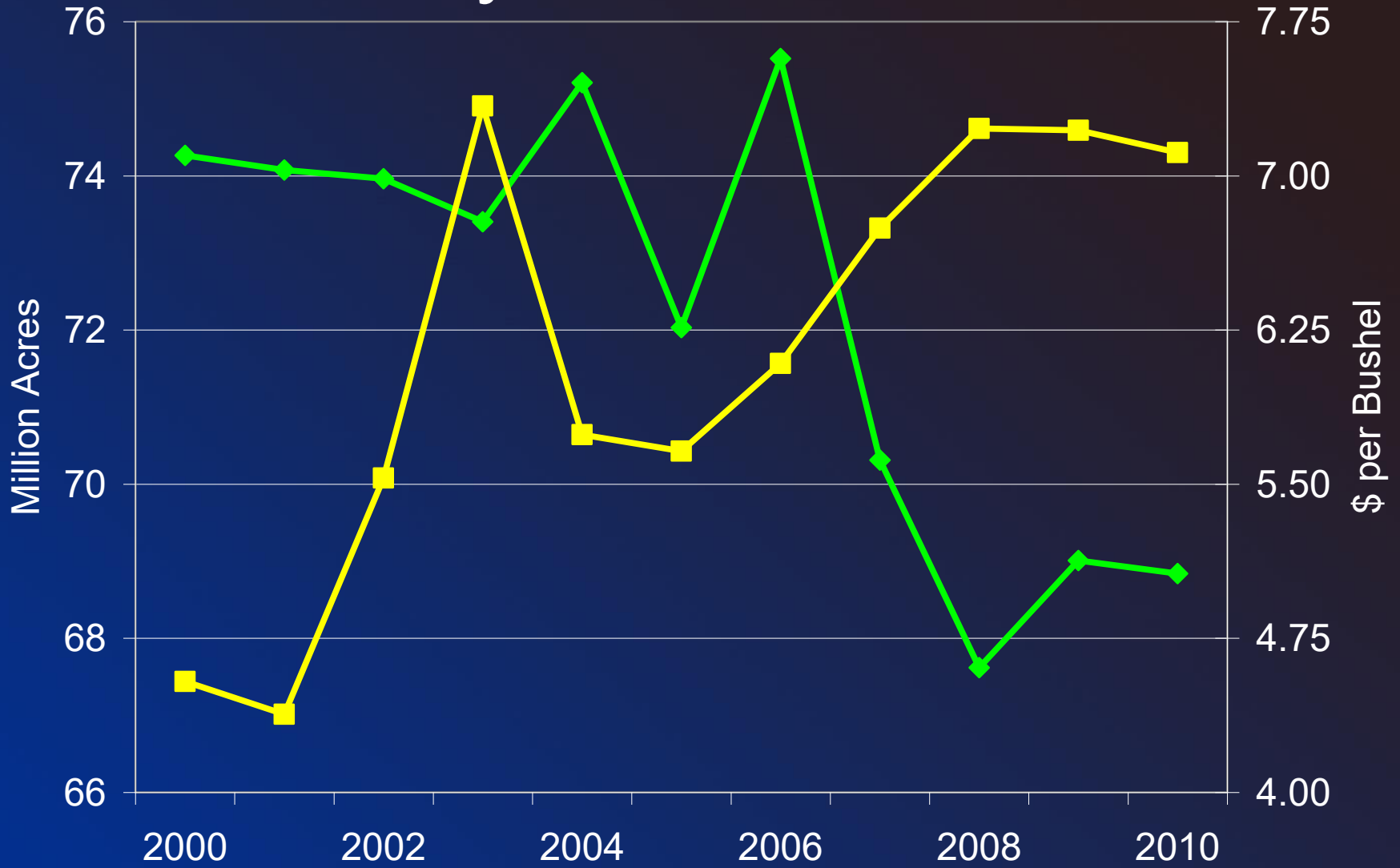
Corn Outlook



◆ Planted Acres ■ Farm Price

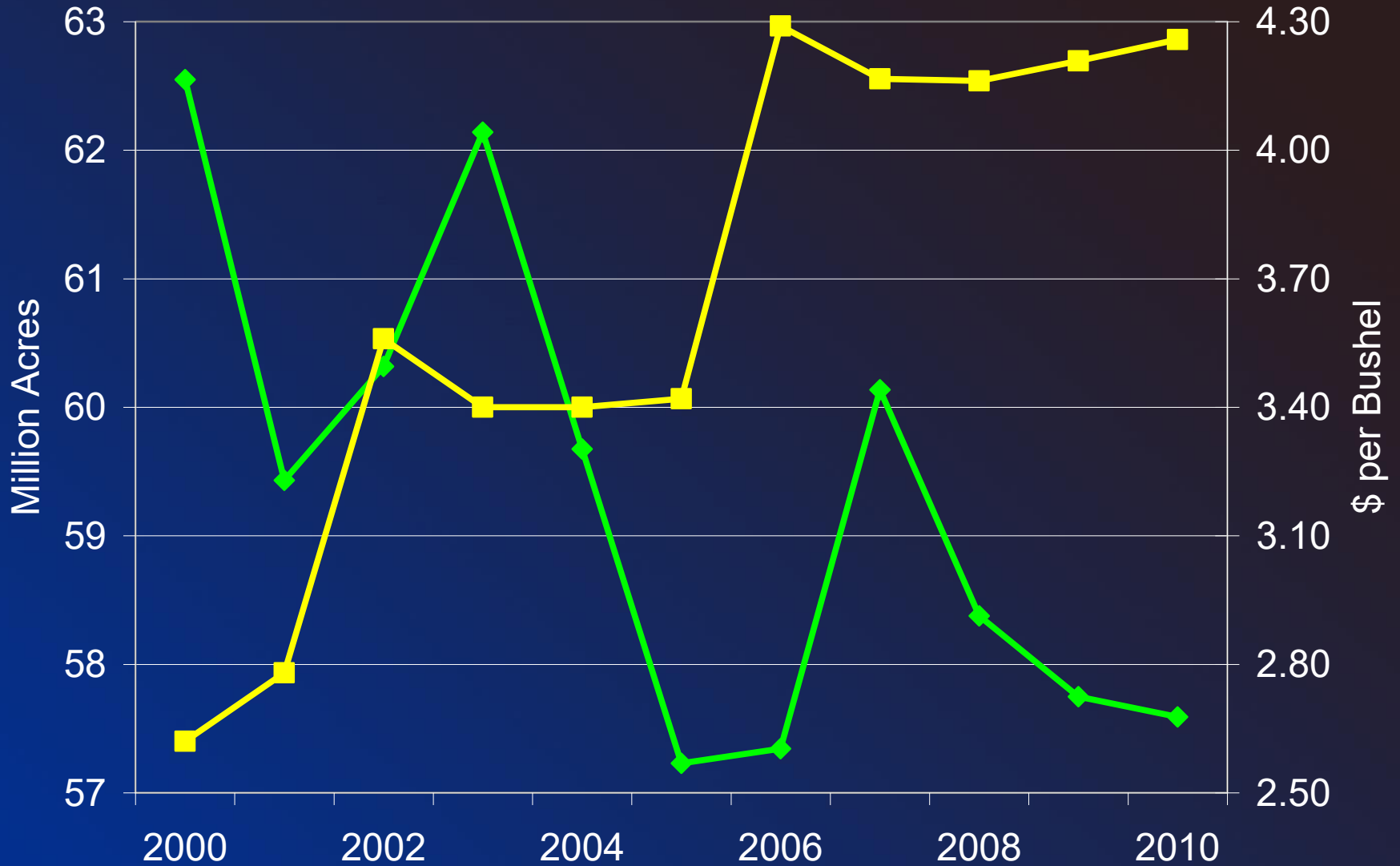


Soybean Outlook



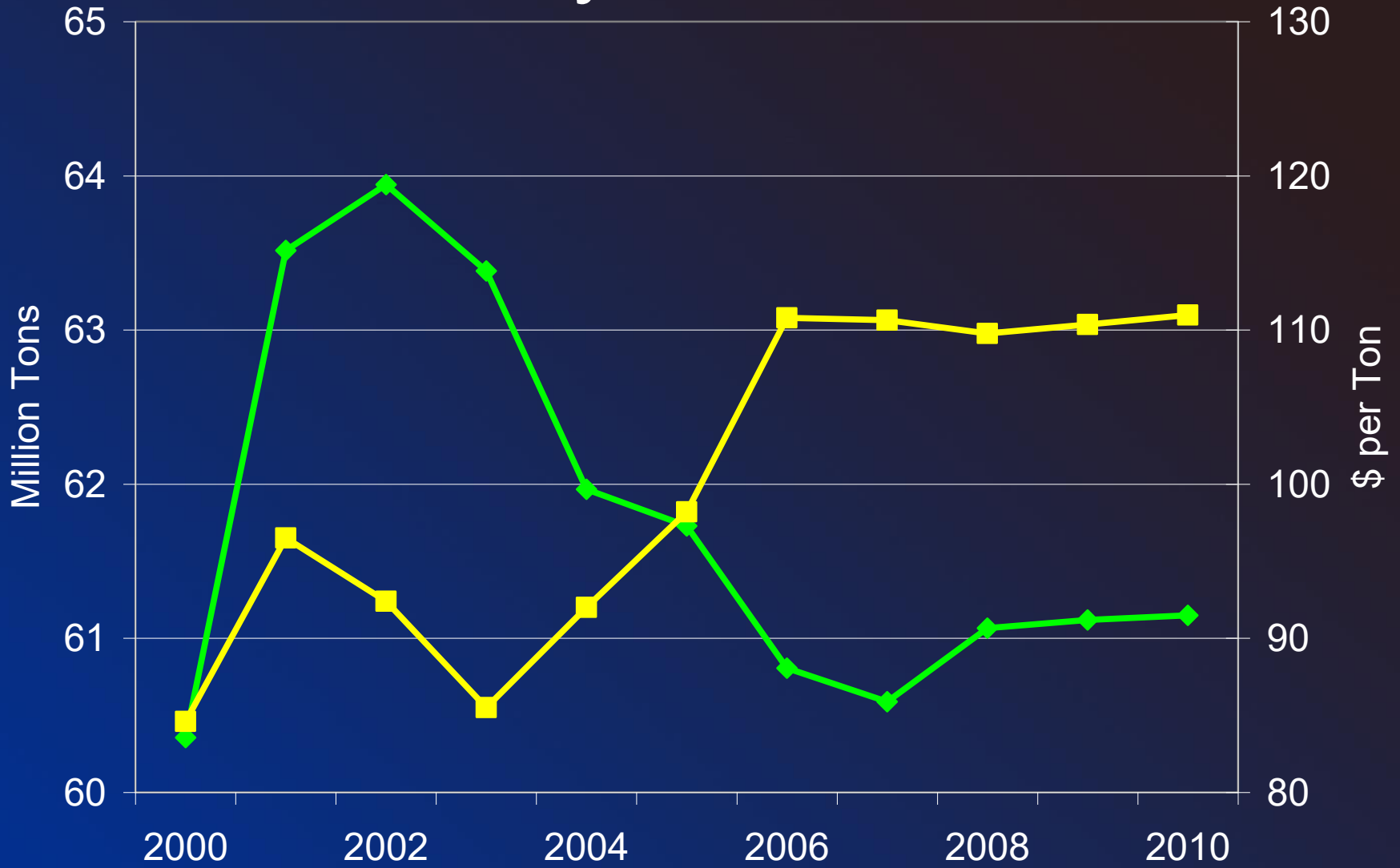
◆ Planted Acres ■ Farm Price

Wheat Outlook



◆ Planted Acres ■ Farm Price

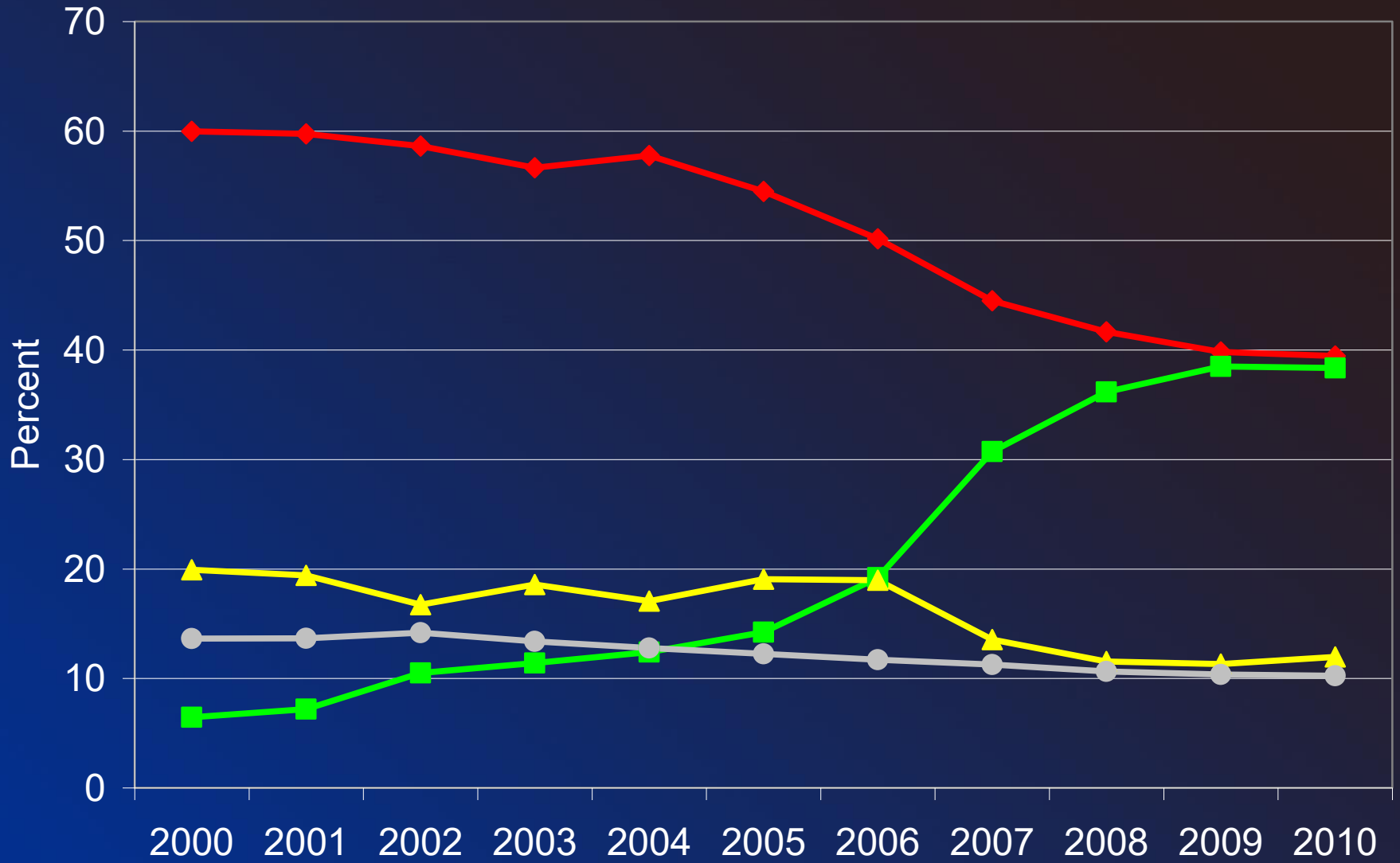
Hay Outlook



◆ Harvested Acres ■ Farm Price



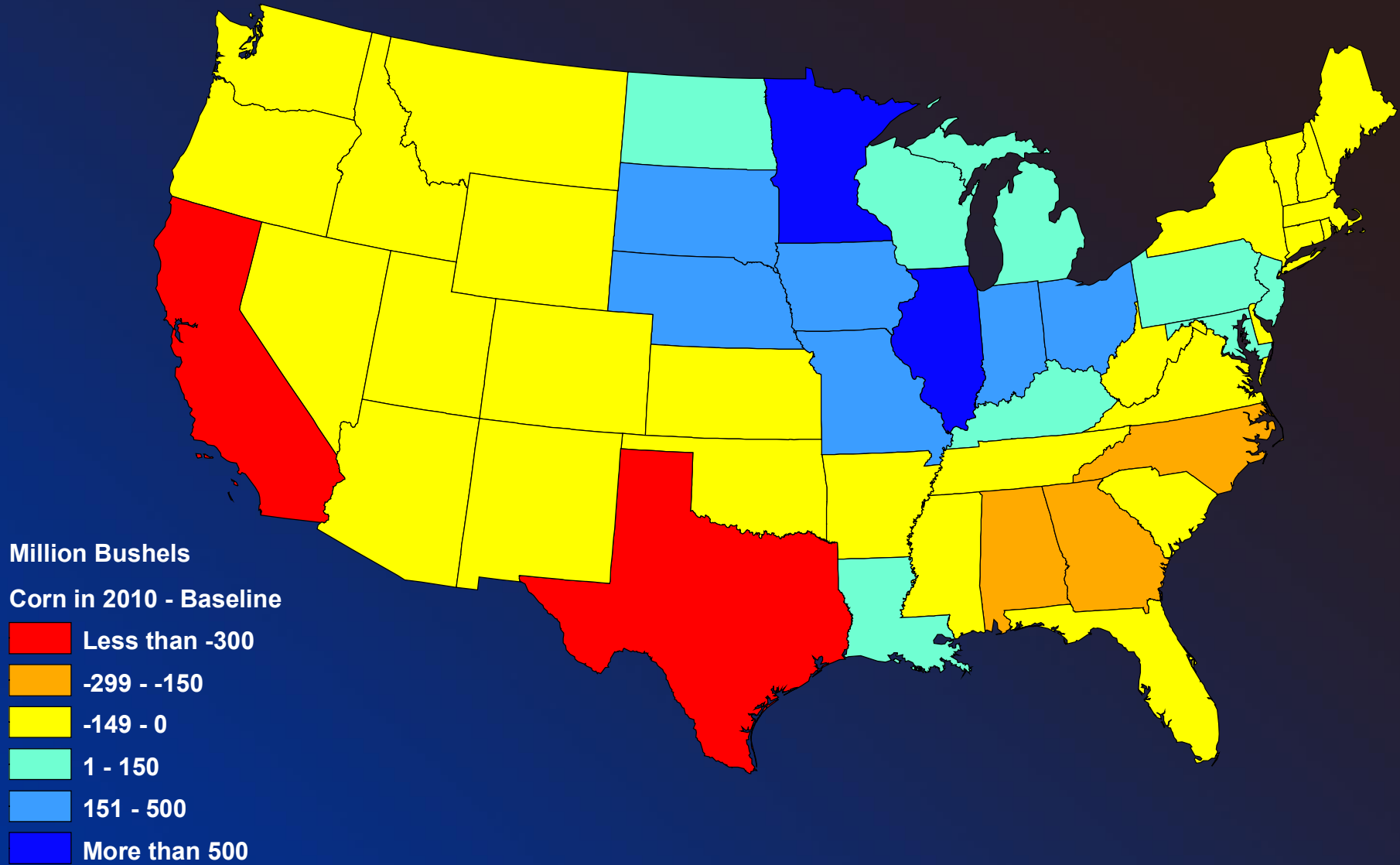
Corn Utilization



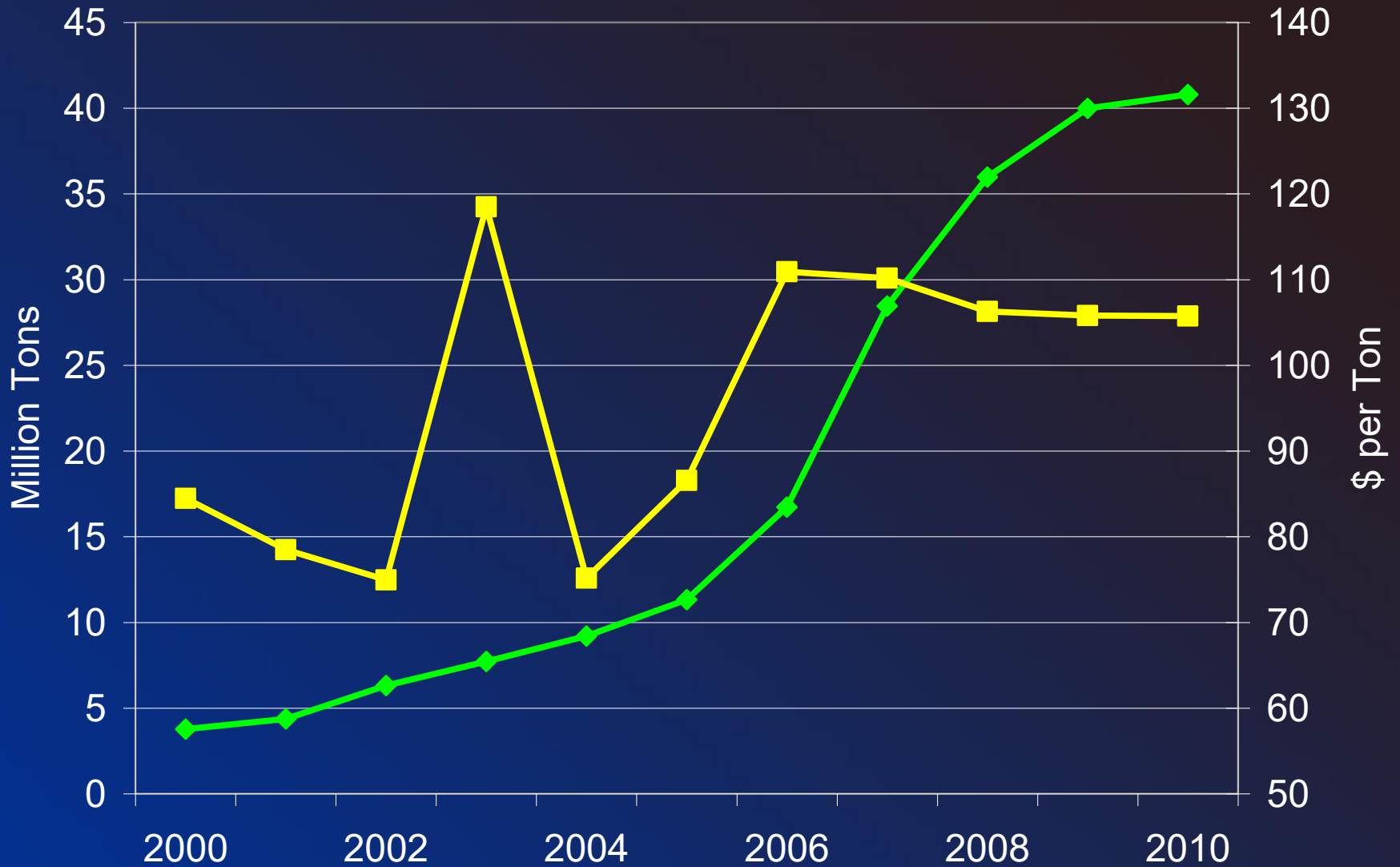
◆ Feed ■ Ethanol ▲ Exports ● Other



Available in 2010



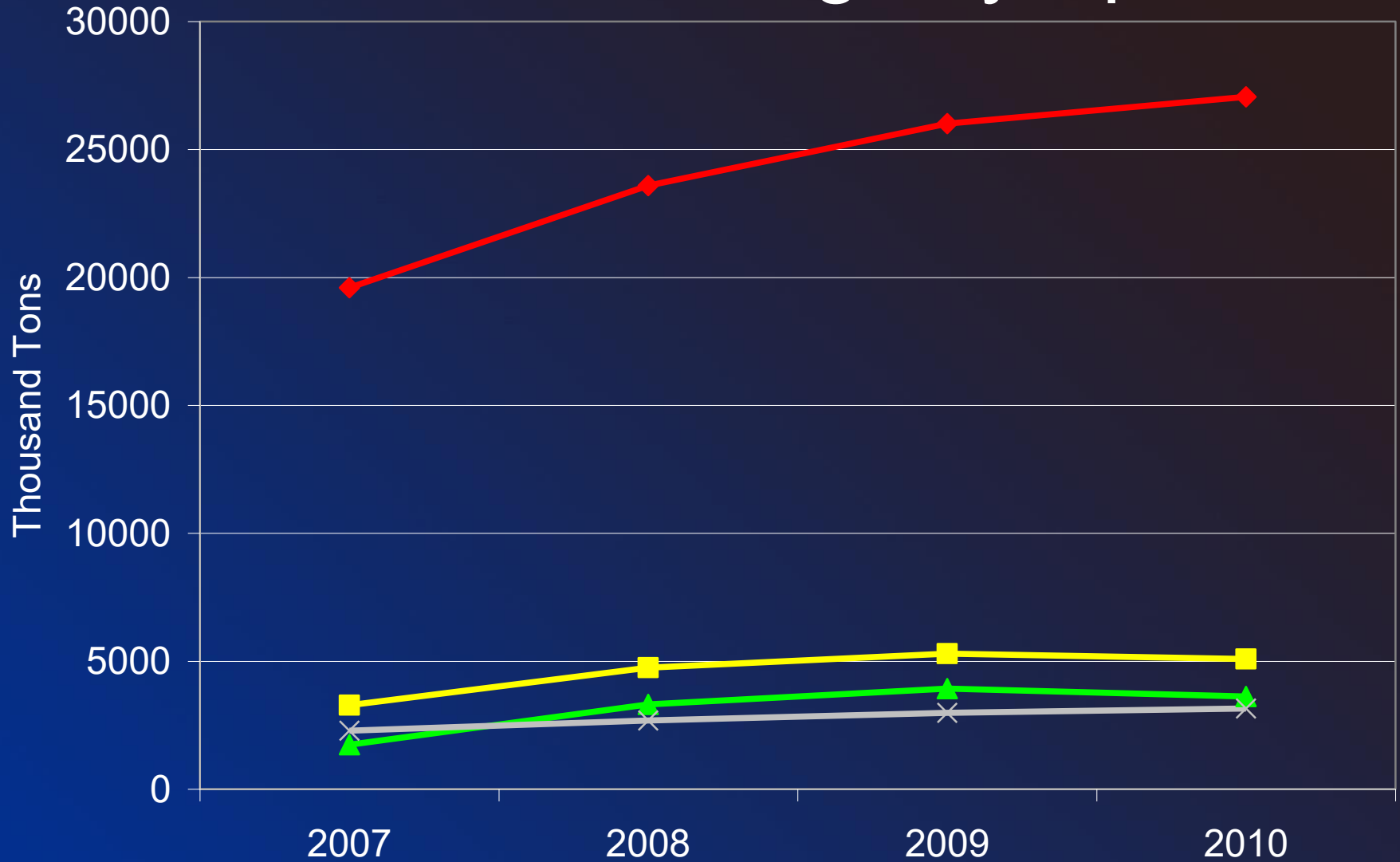
Distillers Grains Outlook



◆ Production ■ Price, DDG, Lawrenceburg, IN



Distillers Grains Usage by Species



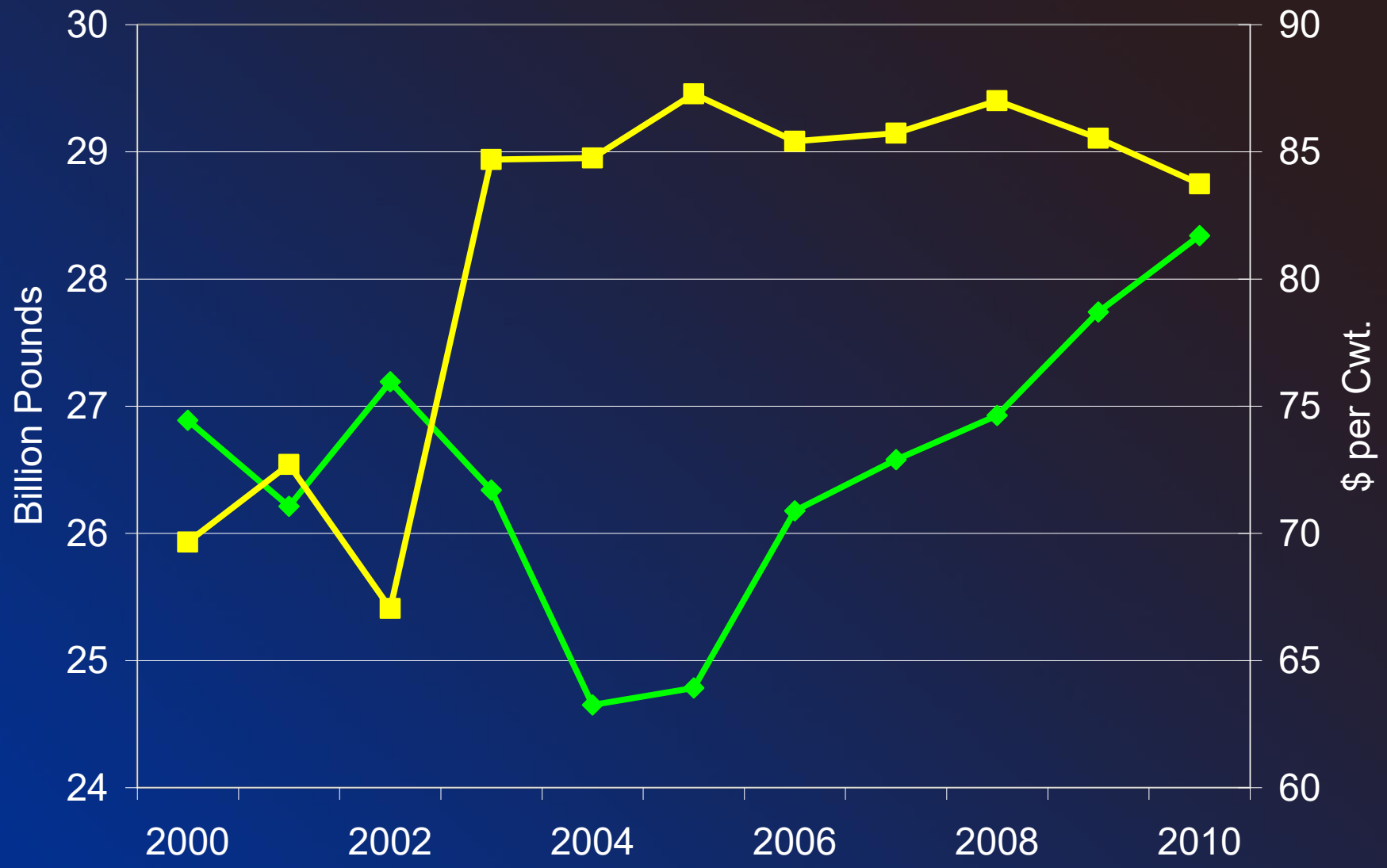
◆ Beef ■ Pork ▲ Poultry ✕ Dairy



A Closer Look



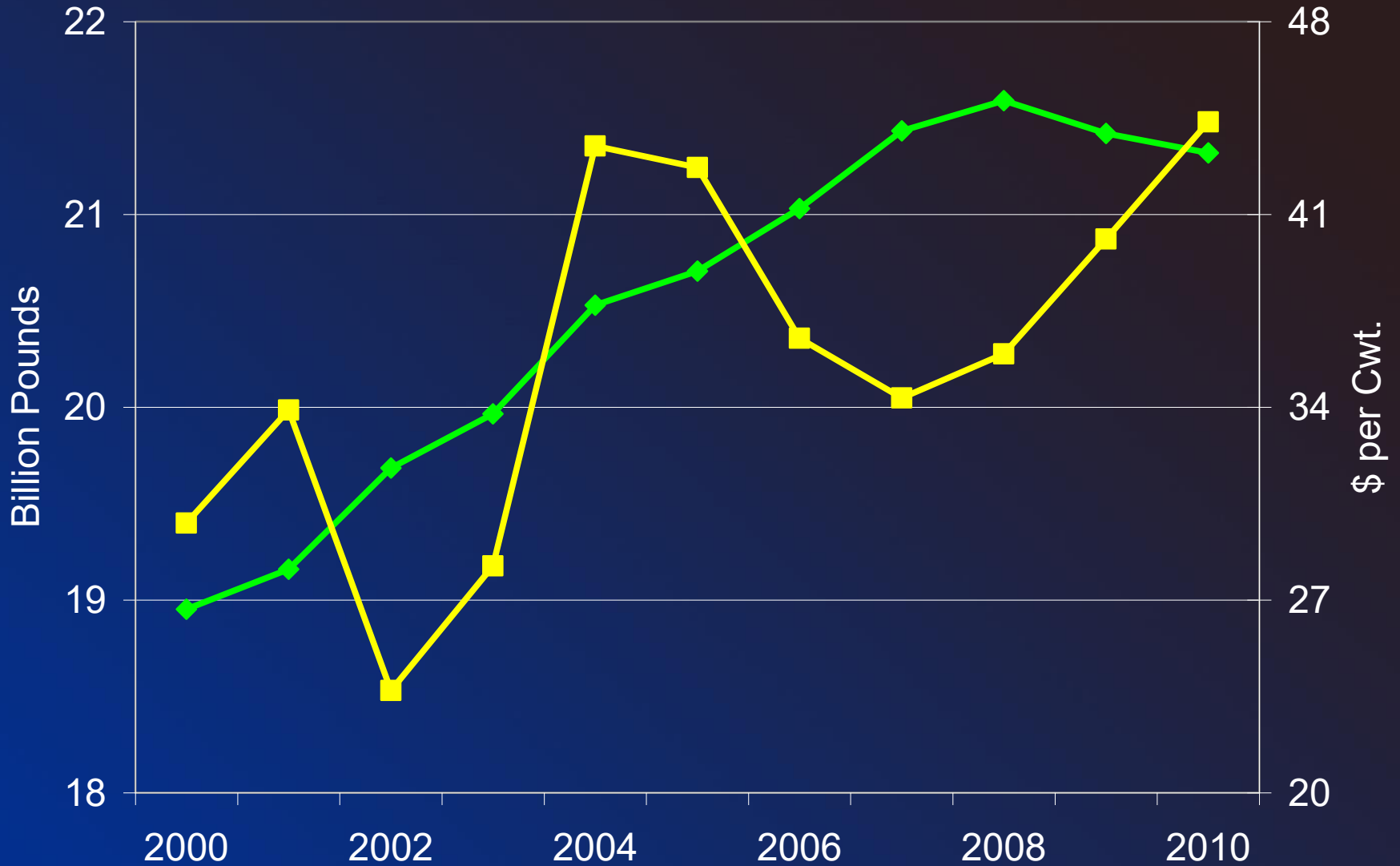
Beef Outlook



◆ Production ■ Price, Nebraska Direct Steers



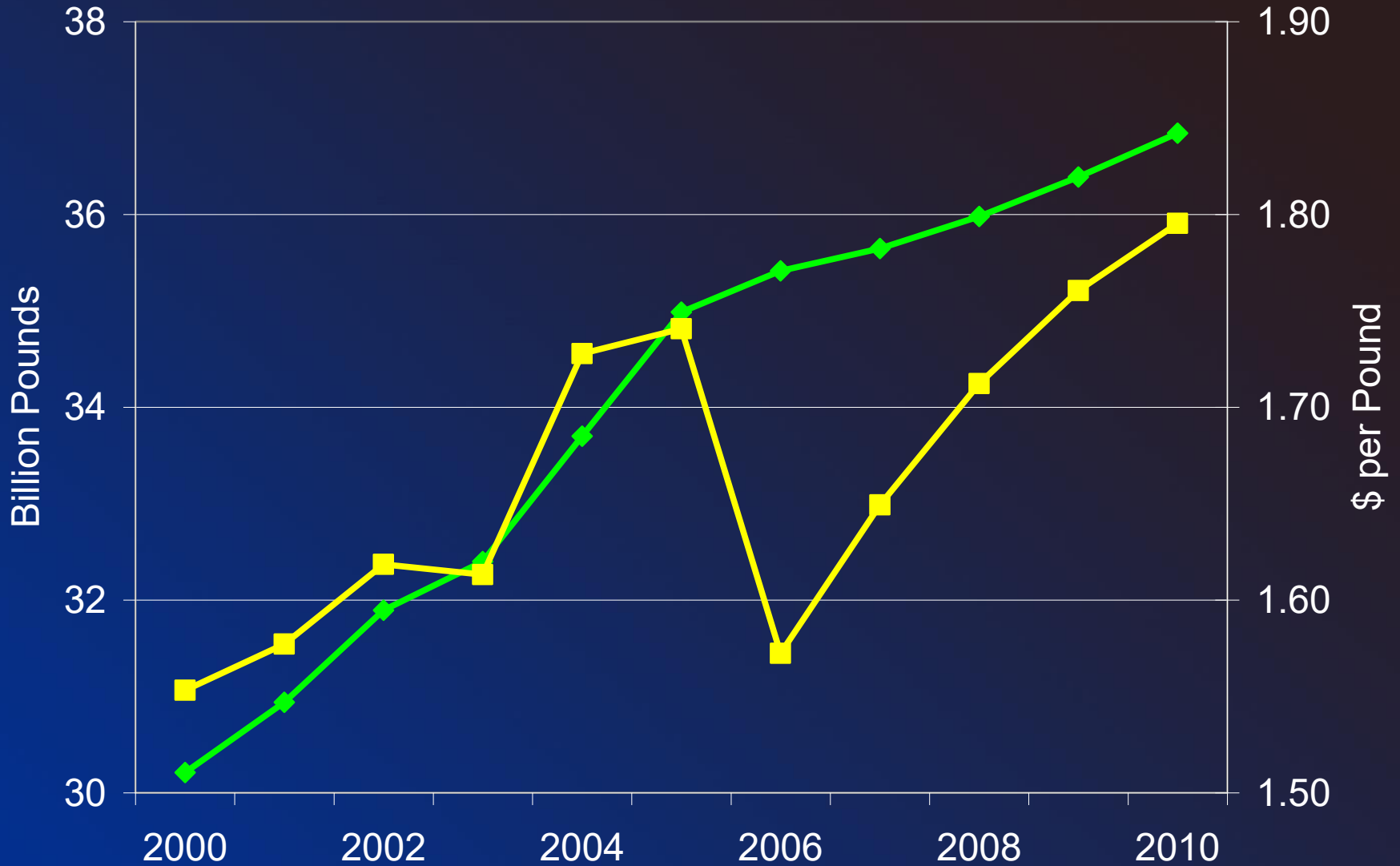
Pork Outlook



◆ Production ■ Price, Sows, Iowa-S. Minn.



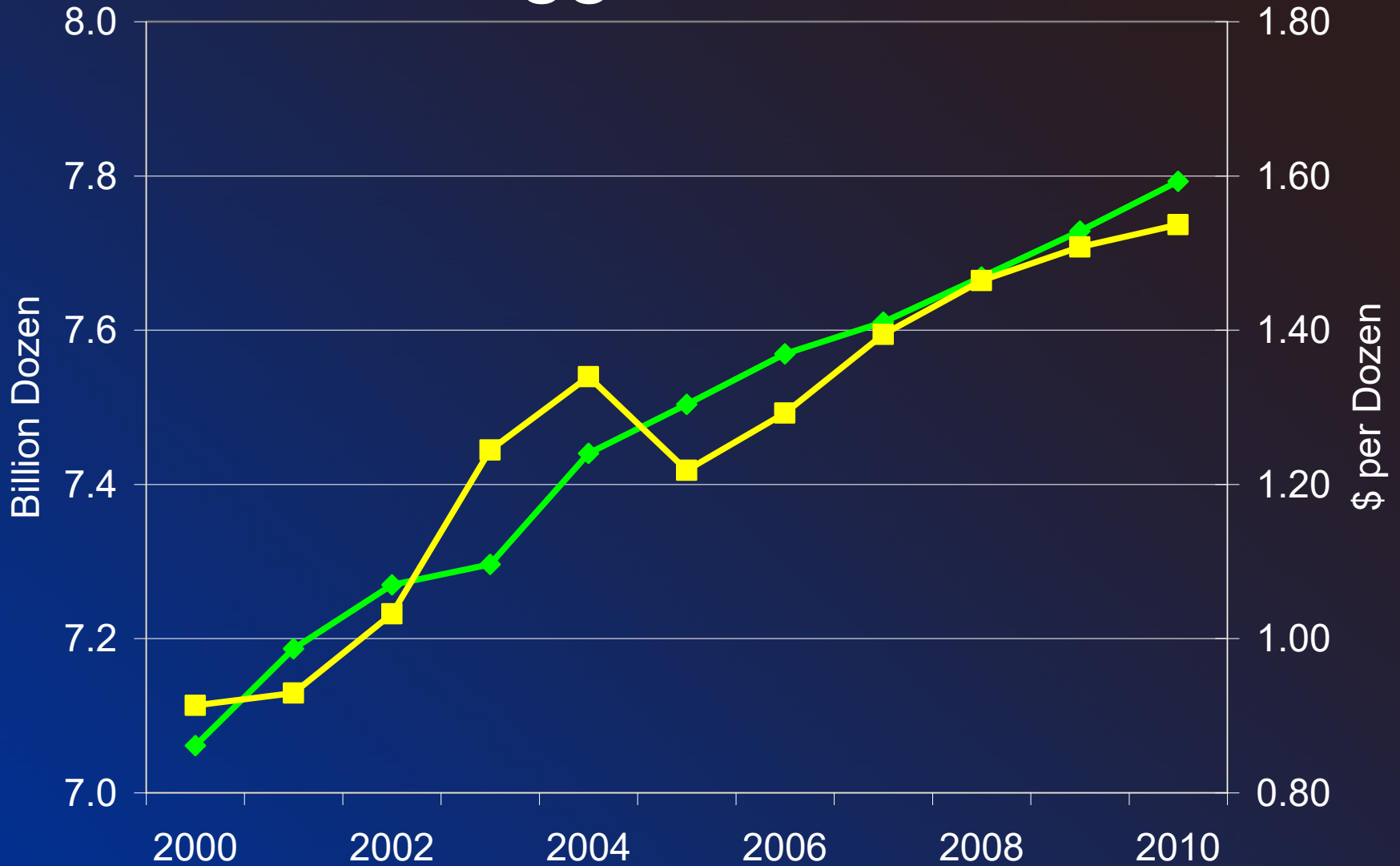
Broiler Outlook



◆ Production ■ Price, Broiler Retail



Egg Outlook



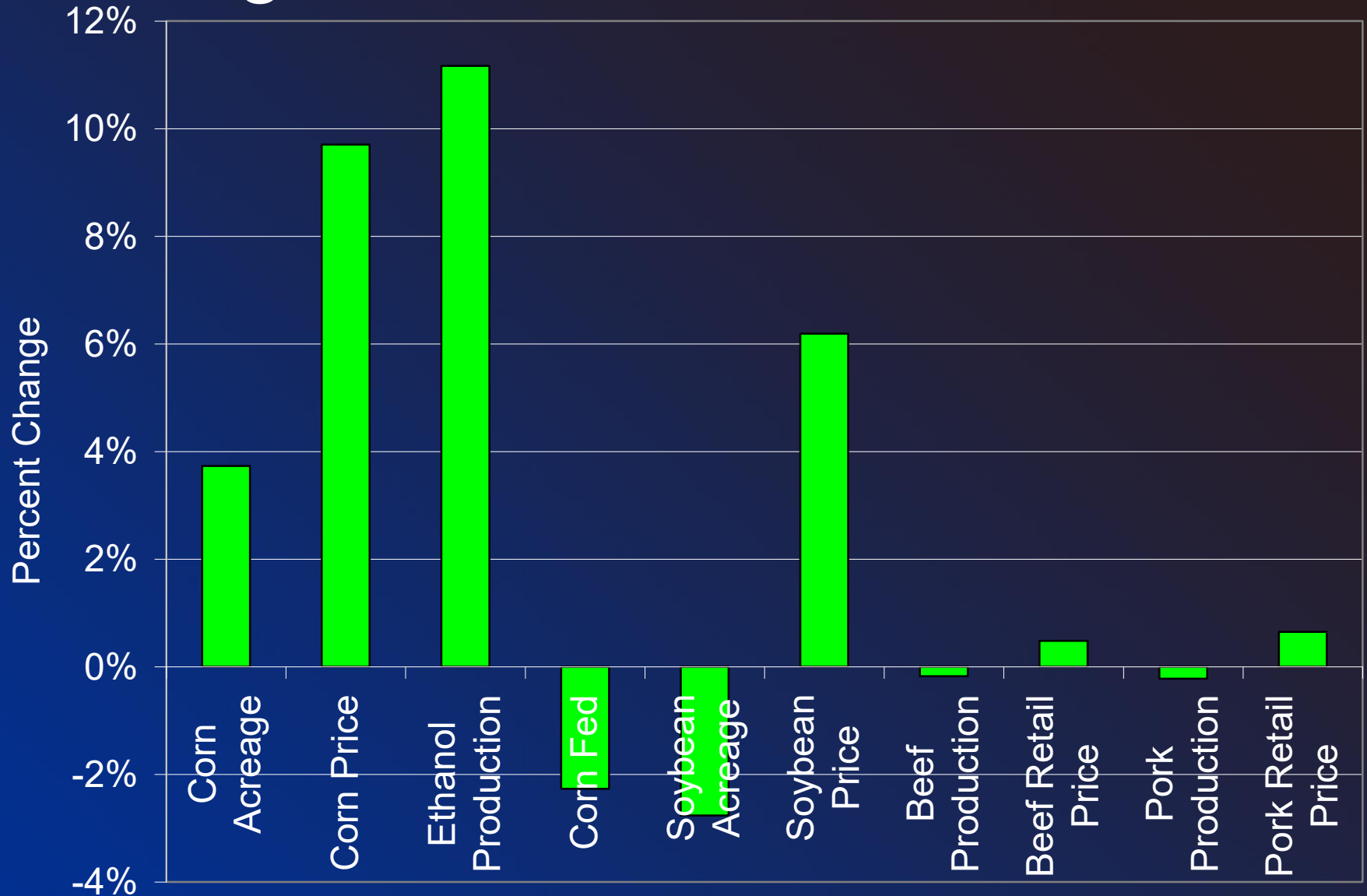
◆ Production ■ Price, Shell Egg Retail



Scenario with Higher Oil Prices

- Assume oil prices are \$10/barrel higher than projected
- Margins on ethanol plants increase
- New incentive to invest in added capacity
- Major hurdle will be felt at 14 – 15 billion gallons due to E-10 saturation
- Drop in ethanol price will eventually encourage increase in flex-fuel cars

Changes from Base Case for 2010



Proposals for the 2008 Farm Bill

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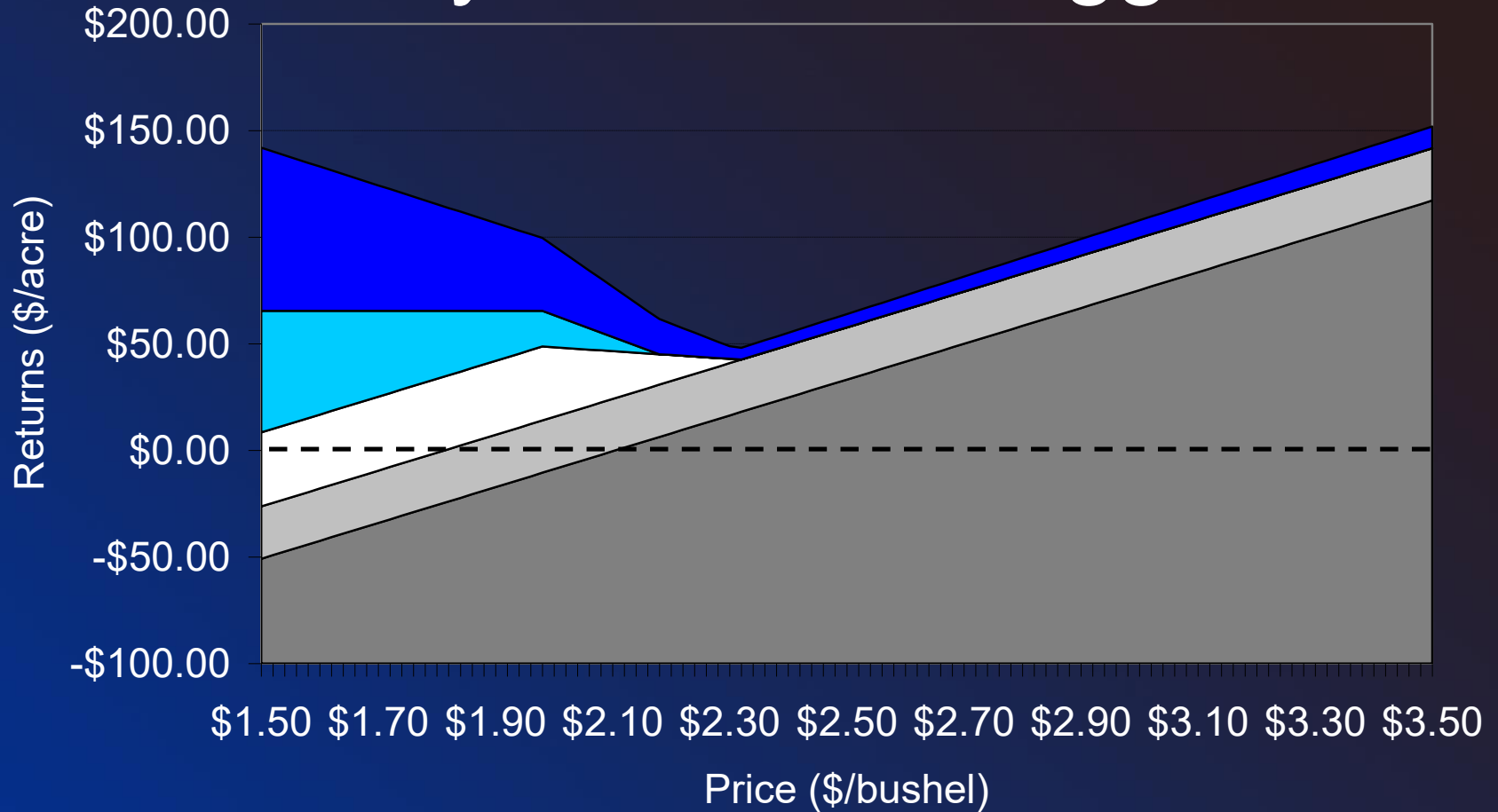
Current Farm Support

- Three main programs
 - Direct Payment Program
 - Counter-cyclical Payment Program
 - Marketing Loan Program
- Direct payments are fixed; counter-cyclical and marketing loan payments vary with price

Key Settings

| Crop | Target Price (\$/bu.) | Direct Payment Rate (\$/bu.) | National Loan Rate (\$/bu.) |
|----------|-----------------------|------------------------------|-----------------------------|
| Corn | 2.63 | 0.28 | 1.95 |
| Soybeans | 5.80 | 0.44 | 5.00 |
| Wheat | 3.92 | 0.52 | 2.75 |

When Payments Are Triggered



- -
 -
- Market Return less Variable Costs
 Direct Payment
- Countercyclical Payment
 Marketing Loan Benefit
- Net Crop Insurance Benefit



Farm Bill Timing

- Debate will pick up this spring
 - Commodity groups presented their proposals to the House yesterday
- Optimistic timeline: Farm bill will be passed and signed this summer, in time for winter wheat
- Both Ag. Committee chairmen (Harkin, Peterson) have stated they will pass a new farm bill, not an extension
 - Rep. Peterson has sounded more extension oriented in recent reports

Farm Bill Budget

- Budget determined by Congress, but based on projections of spending for current farm bill
- With crop prices projected to remain high, current farm support program cost are projected to be low
- This doesn't leave much room for farm bill changes

Farm Bill Proposals

- There are many proposals out there
 - USDA
 - National Corn Growers Association
 - American Soybean Association
 - National Association of Wheat Growers
 - American Farmland Trust
- Can be divided into two camps
 - Modify current structure
 - Move to revenue-based farm support

Wheat Proposal

- Higher target price
 - Wheat: \$5.29/bu., up \$1.37
- Higher direct payment rate
 - Wheat: \$1.19/bu., up \$0.67
- No change on loan rate
- No specifics on other crops



Wheat Proposal

- Proposal would more than double direct payments
- Counter-cyclical payments would trigger at prices below \$4.10/bu.
 - Currently triggered at \$3.40/bu.
- Counter-cyclical payment rate would max at \$1.35/bu.
 - Current max of \$0.65/bu.



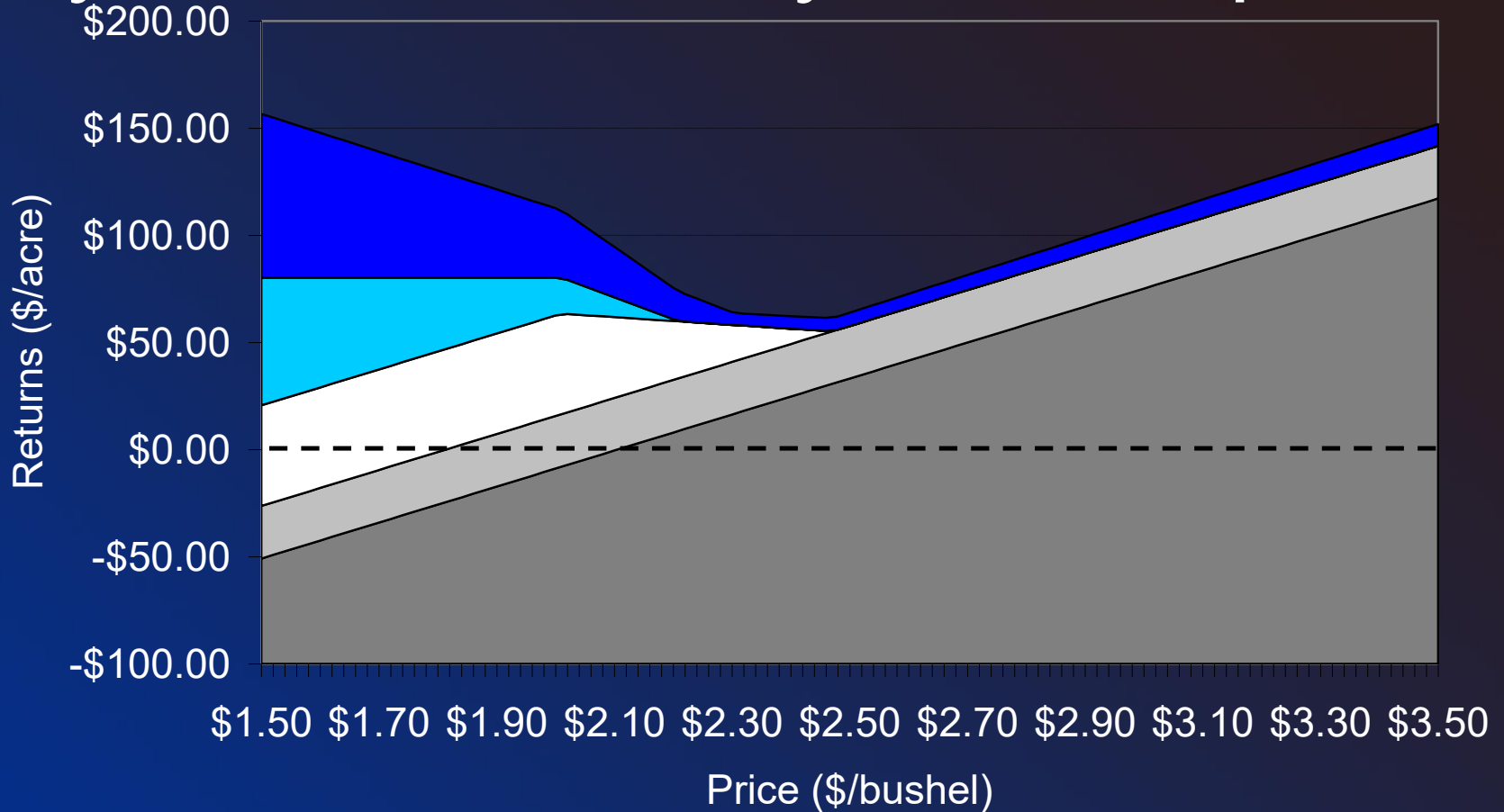
Soybean Proposal

- Higher target prices
 - Higher of current target price or 130% of 2000-2004 Olympic average of season-average prices
- Higher loan rates
 - Higher of current loan rate or 95% of 2000-2004 Olympic average of season-average prices
- No change on direct payments

Soybean Proposal

| Crop | Target Price (\$/bu.) | Direct Payment Rate (\$/bu.) | National Loan Rate (\$/bu.) |
|----------|-----------------------|------------------------------|-----------------------------|
| Corn | 2.75 | 0.28 | 2.01 |
| Soybeans | 6.85 | 0.44 | 5.01 |
| Wheat | 4.15 | 0.52 | 3.03 |

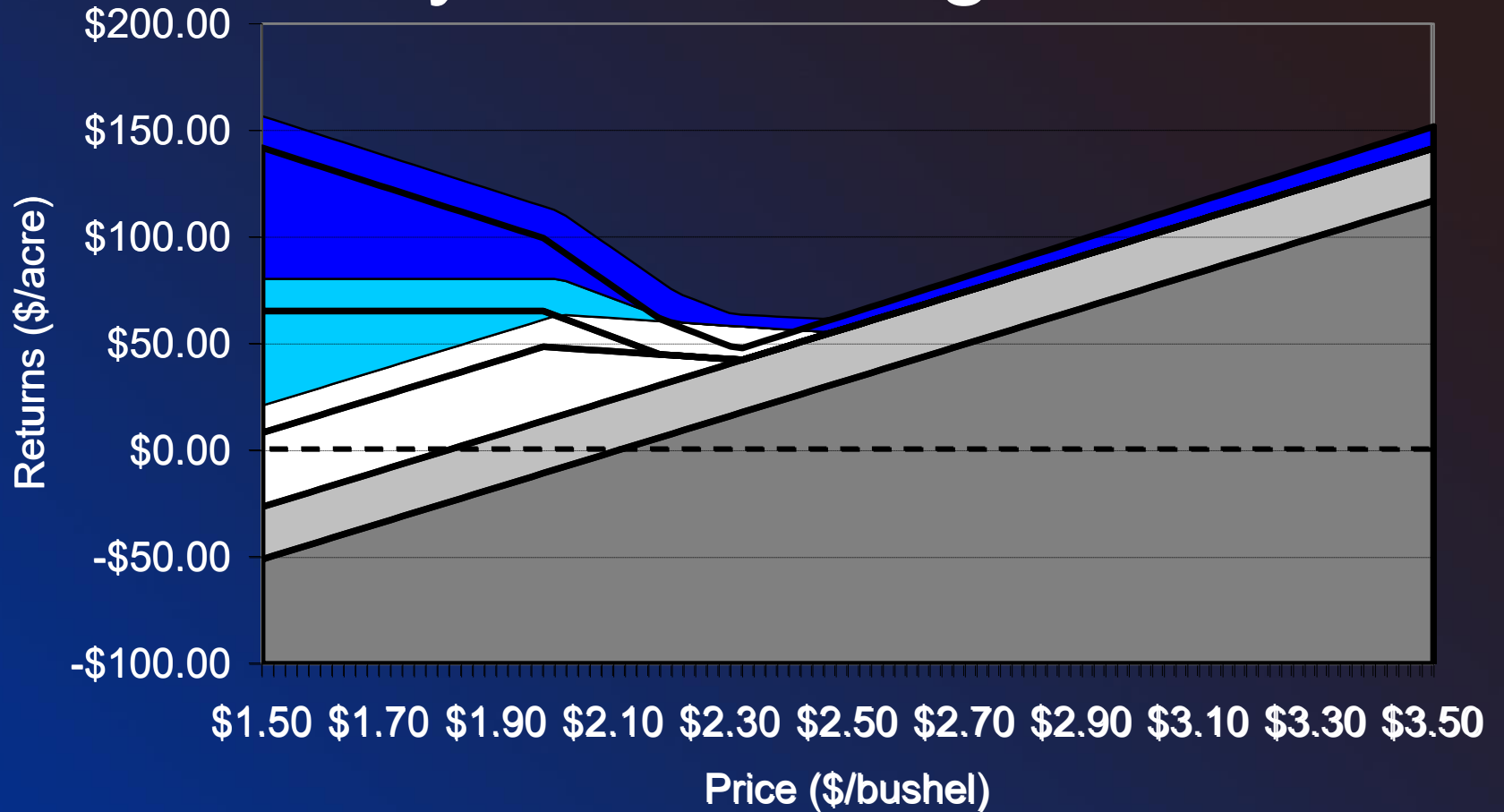
Payments under Soybean Proposal



- Market Return less Variable Costs
- Direct Payment
- Countercyclical Payment
- Marketing Loan Benefit
- Net Crop Insurance Benefit



Payment Changes



- Market Return less Variable Costs
- Direct Payment
- Countercyclical Payment
- Marketing Loan Benefit
- Net Crop Insurance Benefit



Corn Proposal

- Revenue-based support program
 - County-level (Revenue Counter-Cyclical Program)
- Marketing loans changed to recourse loans (means farmers could not forfeit crop as payment for loan)
- No change on direct payments



Revenue Counter-Cyclical Program

- Somewhat like current counter-cyclical program
- Revenue guarantee = Percentage*County trend yield*Projected price
- Actual county revenue = County yield*National price
- Payments made when actual county revenue is below revenue guarantee
- May be integrated with crop insurance



American Farmland Trust Proposal

- Similar to National Corn Growers' Proposal
 - Revenue-based counter-cyclical program
- Revenue guarantee = Percentage*National trend yield*Projected price
- Actual revenue = National yield*National price
- Payments made when actual revenue is below revenue guarantee
- Planned integration with crop insurance
 - Premiums and indemnities reduced by payments from revenue counter-cyclical program



Why Switch to Revenue?

- Critics of the current farm bill point to two main factors
 - Continuing need for disaster assistance
 - Possible overcompensation from price-based programs
 - Example: 2004 for corn, record corn yields, 3rd highest corn crop value, large corn government payments
- Targeting revenue, instead of price, can address these factors

USDA Proposal

- Set loan rate at minimum of loan rates in House-passed version of 2002 farm bill or 85% of 5-year Olympic average prices
- Change marketing loan program from daily price settings to monthly price settings
- Increase direct payment rates
- Change counter-cyclical program to be revenue-based



USDA Proposal

| Crop | Target Price (\$/bu.) | Direct Payment Rate (\$/bu.) | Max. Nat. Loan Rate (\$/bu.) |
|----------|-----------------------|------------------------------|------------------------------|
| Corn | 2.63 | 0.30 | 1.89 |
| Soybeans | 5.80 | 0.50 | 4.92 |
| Wheat | 3.92 | 0.56 | 2.58 |

USDA's Revenue Counter-Cyclical Program

- Revenue guarantee = 2002-2006 National Olympic average yield*Effective target price
 - Effective target price = Target price – Direct payment rate
- Actual revenue = National yield*Max(Season-average price, National loan rate)
- Payments made when actual revenue is below revenue guarantee
- Pays on base acres and yields, not planted acres and actual yields



Corn Example

- 2002-2006 National Olympic average yield = 146.4 bu./acre
- Effective target price = \$2.35/bu.
- Target revenue = \$344.04/acre

- National yield = 130 bu./acre
- Season-average price = \$2.30/bu.
- Actual revenue = \$299.00/acre

- Farm program yield = 114.3 bu./acre

- Current program payment = \$0.05/bu.
 - (\$2.35 - \$2.30)
- Proposed program payment = \$0.394/bu.
 - (($\$344.04 - \299.00)/114.3)

The Next Farm Bill?

- May look like some of these proposals
 - As time proceeds, the odds increase for packages that look like the wheat and soybean proposals
- Congress usually blazes its own trail
 - USDA proposals do not carry significant weight in Congress
- Cost will be a major consideration