Managing Margin Risk
Session 2: February 3
Overview

• Crop Insurance
• 2008 Farm Bill
• ACRE
• SURE
Managing Margin Risk
Crop Insurance

George Patrick
Department of Agricultural Economics
Purdue University
1-888-398-4636 ext. 44241
What is RISK?

Future is not known - actions may have unexpected consequences
- may be good or bad

Generally concerned with situations with
- significant chance of adverse outcome
- severe consequences if the adverse outcome does occur
Objectives of Risk Management

• Reduce the chances of a loss
• Reduce the severity of a loss
• Cost as little as possible
Sources of Business Risks

• Market or price risk
• Production risk
• Technological risk in agriculture and non-farm sector
• Legal and social sources
• Human sources of risk
Figure 1. Actual Corn Yields in Bushels/Acre
White County 1965-07
Figure 2. Actual and Trend Corn Yields in White County, 1965-07 (trend 1.9 bu./year)
Figure 3. Actual Corn Yields as a Percent of Trend
White County 1965-07
White County Corn Yields

43 years total
  25 were at trend or above
  18 were below trend
White County Corn Yields

43 years total
  25 were at trend or above
  18 were below trend
Bad years are not frequent as average or above average years
Bad years are worse than good years are good!
Crop Insurance Alternatives

- Multiple Peril (Yield Insurance)
  - Actual Production History (APH)
  - Group Risk Plan (GRP)
- Multiple Peril and Price (Revenue Ins.)
  - Crop Revenue Coverage (CRC)
  - Revenue Assurance (RA)
  - Income Protection Plan (IPP)
  - Group Risk Income Protection (GRIP)
Multi-Peril APH Insurance

• Insurance against losses from almost any cause except poor farming practices
• Large deductible - protection against major losses only
  50 to 85% of historical production level
  (15 to 50% deductible)
• Prevented planting/replant protection
Multi-Peril APH Insurance

• Level of yield coverage generally varies from 50 to 85% of APH yield
• FCIC price is set based on futures prices for Dec. corn and Nov. beans (tends to reflect producer level price)
• Producer can choose between 55% and 100% of max. price (most common)
• CAT coverage is 50% yield, 55% price
Multi-Peril APH Insurance

• Actual yields for at least 4 years (up to 10 years if available) to establish the APH yields
  -Severe yield guarantee penalties w/o historical yields
• Indemnity is based on actual and appraised yield of the insurance unit relative to APH yield guarantee
Multi-Peril APH Insurance

• Historical corn yields increase 1.5 bu./year (15 bu. over 10 years)
• APH yield underestimates expected yield by about 7.5 bu. or about 5%
• 75% coverage level is only about 70% of expected yield
Multi-Peril APH Insurance

Basic unit
• All land owned and cash rented in a county
• All land share leased from same landlord in a county

Optional units
• With records
• Higher (10%) premiums
Multi-Peril APH Insurance

Enterprise unit

• All acreage of the insured crop in the county in which the insured has an interest

• Increased premium subsidy, not to exceed 80% of total
Multi-Peril Crop Insurance

Indemnity is calculated:
(Guaranteed Yield - Actual Yield) X Price

Example:
142 bu. APH yield, 75% level, $4.00
yield guarantee is 75% X 142 = 106 bu.
Producer harvests 90 bushels
106 bu. guarantee - 90 bu. yield = 16 bu.
16 bu. X $4.00 = $64.00/acre indemnity
Revenue Insurances

- Crop Revenue Coverage (CRC)
- Revenue Assurance (RA)
  - no harvest price option (RA-BP)
  - harvest price option (RA-HP)
- Income Protection Plan (IP or IPP)
- Group Risk Income Protection (GRIP)
Crop Revenue Coverage (CRC)

- Provides both yield and price protection
  Yield protection is based on APH
- If futures prices change from spring to harvest, use higher price for insurance
- Limit on price movement, eliminated for ’09 and later years
- Revenue guarantee and indemnity are based on the futures price, not the price received by a producer
CRC Indemnities

Revenue guarantee level -
“Production to count”
(Lower of actual yield or APH guarantee level)
\[ \times \text{Price (higher of spring or harvest)} \]
= Indemnity
Crop Revenue Coverage

- Indemnities can be triggered by shortfalls in revenue due to:
  1. Low yields
  2. Decline in prices (not low prices)
  3. Combination of low yields and declines in prices
- Premiums are subsidized
  (both yield and price components)
Revenue Assurance (RA)

• Generally similar to CRC
  (will be combined in ’10?)
  No harvest price option - uses spring price
  Harvest price option - uses higher of spring or harvest price like CRC

• Some differences in units from CRC
  Generally larger units or combinations of enterprises
  Check with insurance agent
Income Protection Plan (IPP)

- If income falls below insured level, pays an indemnity like RA or CRC
- Unit is typically enterprise or farm
- Builds on the “natural hedge”
  - Low yields generally have higher prices
- Low yield/high price may result in no indemnity if income is > insured level
- Premiums generally lower than APH
- NOT popular with Indiana farmers
Group Risk Plan (GRP) (yield only)

- Coverage is based on expected county yields and actual county yields
- Individual’s yield is not relevant
  - No prevented planting/replant coverage
- “Trigger level” - % of exp. county yield
- Ranges from 70 to 90% of exp. yield
- Producers with high yields can buy coverage up to 150% of county yield
GRP Indemnity

- Indemnity is paid if county yield is below the trigger yield of the insurance (142 bu. X 90%) = 128 bu.
- Indemnity is % shortfall X coverage level

$$((128 - 90)/128) = 29.7\% \times \$500 = \$148.50$$
GRP Insurance

• Indemnity is paid only if the county yield is below the trigger yield
  - (payment in following March)
• Producer could have a disaster and county be near normal
• Producer could do well, but get an indemnity if county yield is low
Group Risk Income Protection (GRIP)

- Based off the GRP concept
- Pays if actual county revenue drops below trigger revenue
- Expected prices are based on futures prices in Feb like CRC
- Now has harvest price option
- “Harvest” price is Nov. soybeans futures in Oct and Dec. corn in Nov.
## Crop Insurance, Indiana 2004 and 2008

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<th>Soybeans % of insured acres</th>
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Crop Insurance Premiums

• Variability of yields: greater variability - higher premiums
• Level of coverage - more than proportional increase in cost
• Price and price volatility
• Premium subsidy
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## Premium Subsidies - 2009

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## Est. 2009 Corn Premiums

Adams County – 137 bu. APH

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## Est. 2009 Soybean Premiums

Adams County – 46 bu. APH

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# Est. 2009 Soybean Premiums
Bartholomew Co – 49 bu. APH

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### Est. 2009 Corn Premiums
#### Tippecanoe Co – 172 bu. APH

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### Est. 2009 Soybean Premiums
**Tippecanoe Co – 50 bu. APH**

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Figure 3. Actual Corn Yields as a Percent of Trend
White County 1965-07
Figure 4. Actual County Corn Yields as Percent of Trend, White County, 1965-07
Figure 5. Actual Bean Yields as a Percent of Trend
White County, 1965-07
Crop Insurance Payment Simulator (County-level)

1. Estimated yield distribution
2. Farmer-paid premium costs
3. Freq/size of indemnity
4. 1% and 5% VaR – downside risk
5. Est. net long-term cost of insurance
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<td>24.95</td>
<td>8.48</td>
<td>17.01</td>
<td>5.85</td>
<td>3.70</td>
<td>7.20</td>
</tr>
<tr>
<td>90%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>8.63</td>
<td>9.79</td>
<td>14.35</td>
</tr>
</tbody>
</table>
'09 Pilot Biotechnology Endorsement (BE) for Corn

- Replaces the Pilot Biotech Yield Endorsement (BYE) product
- Producer must plant at least 75% of a unit to a hybrid(s) that contain a specific combination of biotech traits for a discount
Pilot BE – ’08 Discounts

- Discount applies only to yield portion of premium
- Premium: % of normal premium

<table>
<thead>
<tr>
<th>Product</th>
<th>65%</th>
<th>75%</th>
<th>85%</th>
</tr>
</thead>
<tbody>
<tr>
<td>APH</td>
<td>62.7</td>
<td>72.2</td>
<td>79.7</td>
</tr>
<tr>
<td>CRC</td>
<td>71.4</td>
<td>80.4</td>
<td>86.1</td>
</tr>
</tbody>
</table>
Additional Information
County Specific Information

www.farmdoc.uiuc.edu/cropins/

1. Premium Calculator
   Specify county, crop and yield

2. Insurance Evaluator
   Specify county and crop
   Analyzes past performance
Commodity Title of the Farm

Bill: What is ACRE?

Allan Gray
Department of Agricultural Economics
Purdue University
Commodity Program Overview

- **Major Changes Impacting Commodity Programs**
  - ACRE
  - Payment limits and AGI eligibility criterion
  - LDP posted county prices
  - SURE

- **As a condition to receive benefits, bill requires producers to submit annual acreage reports and annual production reports**
Commodity provisions very close to previous programs
- Continue direct payments
- Continue marketing loan gains/LDPs
- Maintain counter-cyclical payments (CCPs)

or

Provides producer option for Average Crop Revenue Election (ACRE) Payment
- Producer has to agree to direct payment and loan rate reductions
# Changes in Payments

- **Direct Payments**
  - 2% reduction in ‘09-’11
  - Advanced Payment 22% in October before crop is planted (lower than before)
  - No advanced payments in 2012.

- **CCP**
  - 2% reduction in ‘09-’11
  - 40% advanced payments after first 180 days of the marketing year
  - No advanced payment in ‘11 and ‘12

- **LDP**
  - Repayment based on average of last 30 days posted county price
Average Crop Revenue Election (ACRE) Payment

- Beginning with the 2009 crop year producers have the option to choose:
  - CCP, DP (with full payment rates), and MLG/LDPs (with full loan rates) or
  - ACRE, DP (with a 20% reduction in payment rates) and MLG/LDPs (with a 30% reduction in loan rates)

- Producers can make the choice in any year
  - If ACRE is chosen it is an irrevocable choice
  - If producers does not make a declaration the original program is assumed to be the choice
Average Crop Revenue Election (ACRE) Payment

- This election is for all the crops grown on each FSA farm #
  - A farmer could choose to select ACRE for certain farms (FSA farm #s) and not others
  - Failure of all producers on a farm to make the ACRE election by the deadline will result in the CCP option for all participants
- Producers will have to determine if benefits from ACRE outweigh loss of guaranteed payments
Average Crop Revenue Election

State Level ACRE Guarantee > Actual State Revenue

AND

Farm Level ACRE Guarantee > Actual Farm Revenue

THEN

Farm Receives an ACRE payment based on ratio of farm’s historical yield to State historical yield

Note: All Yields are Planted Acre Yields
Average Crop Revenue Election

State ACRE Guarantee = 90%
* 5-Year Olympic State Avg. Yield *
2-year Natl. Average Mkt. Yr.
Price
Restricted to < 10% change/year

AND

Farm ACRE Benchmark =
Farm’s 5-Year Olympic Avg. Yield *
2-year Natl. Average Mkt. Yr.
Price + Ins Premium

Actual State Revenue =
Actual State Planted Acre Yield *
MAX[ Natl. Average Mkt. Yr. Price OR
70% Loan Rate]

AND

Actual Farm Revenue =
Actual Farm’s Planted Acre Yield *
MAX[ Natl. Average Mkt. Yr. Price OR
70% Loan Rate]

THEN

Farm Payment = 0.833 (0.85 in 2012) * Actual Planted or Considered Planted Acres *
[ Farm’s 5-Year Olympic Average Yield / State’s 5-year Olympic Average Yield ] *
MIN[ (State ACRE Guarantee – Actual State Revenue) OR State ACRE Guarantee * 25%]

Note: All Yields are Planted Acre Yields
<table>
<thead>
<tr>
<th>ACRE Calculation Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Carroll County Indiana</td>
</tr>
<tr>
<td>• Corn and Soybeans 900 ac each, wheat 200 ac</td>
</tr>
<tr>
<td>• DP Yields: 129, 40, and 59</td>
</tr>
<tr>
<td>• CCP Yields: 149, 46, and 68</td>
</tr>
<tr>
<td>• Average Yields: 160, 49, and 80</td>
</tr>
<tr>
<td>• 1000 combinations of prices and yields over 2008 to 2012 to understand risk management aspects of program</td>
</tr>
</tbody>
</table>
ACRE Calculation Assumptions

- Alternative Price Pattern Assumptions
  - Flat prices:
    - $3.75 corn; $8.80 Beans; $5.50 Wheat
  - Declining Prices:
    - $3.19 to $1.65 corn; $7.52 to $3.93 beans; $4.68 to 2.44 wheat
  - Rising Prices and USDA price series

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>$ 3.75</td>
<td>$ 3.80</td>
<td>$ 3.60</td>
<td>$ 3.50</td>
<td>$ 3.50</td>
</tr>
<tr>
<td>Soybeans</td>
<td>$ 8.85</td>
<td>$ 8.90</td>
<td>$ 8.75</td>
<td>$ 8.80</td>
<td>$ 8.80</td>
</tr>
<tr>
<td>Wheat</td>
<td>$ 5.50</td>
<td>$ 5.00</td>
<td>$ 4.65</td>
<td>$ 4.50</td>
<td>$ 4.50</td>
</tr>
</tbody>
</table>
Comparison of State Level ACRE Guarantee and CCP Guarantee Corn in Indiana

State Level Guarantee for Corn
Declining Price Scenario

@RISK Student Version
For Academic Use Only

CCP Guarantee
$350

2009 Through 2012

Mean
25% - 75%
1% - 99%
Comparison of State Level ACRE Guarantee and CCP Guarantee Soybeans in Indiana

State Level Guarantee for Soybeans

Declining Prices

@RISK Student Version
For Academic Use Only

Mean
25% - 75%
1% - 99%

$/Acre

250
300
350
400
450
500

CCP Guarantee
$255

2009 to 2012
Comparison of State Level ACRE Guarantee and CCP Guarantee Soybeans in Indiana

State Level Guarantee for Wheat
Declining Prices

@RISK Student Version
For Academic Use Only

CCP Guarantee
$248

2009 to 2012
ACRE: Initial thoughts

- Declining Prices Favor ACRE because of the 10% cup placed on the State Level Guarantee

- ACRE is an insurance program that insures systemic risk (broad, long-term risks) and comes with a premium

- Producers need to decide, is the premium worth the increased guarantee?
  - On Average $4.62/acre for example farm
Comparison of Government Payments Differences

- Flat Prices
- Declining Prices
- Rising Prices
- USDA Prices

Comparison of government payments using a chart that illustrates differences in prices. The chart includes data for flat prices, declining prices, rising prices, and USDA prices. The legend indicates the comparison of payments with ranges 1% - 99%, 25% - 75%, and mean.
ACRE: Initial thoughts continued

- ACRE likely favors
  - States with high yield variability
  - Crops with prices well above loan rates
  - States with larger increases in yields
- ACRE is a poor substitute for crop insurance
- Crop insurance is a poor substitute for ACRE
- Probably some redundancy
Payment Limitations and Direct Attribution

- $40,000 limit on direct payments and $65,000 limit on counter-cyclical payments and ACRE
  - If ACRE is chosen then reduction in DP is added to ACRE limitation
- LDP/MLG’s are not limited
-Eliminates 3 entity rule and uses Direct attribution to a living person
  - If one spouse is assumed to be actively engaged then both spouses are assumed to be eligible
  - Payments for children under 18 are attributed to parent(s)
  - Will trace through 4 levels of ownership in legal entities to attribute payments
Adjusted Gross Income Test

Replaces the $2.5 million adjusted gross income limitation to receive commodity, disaster, or conservation benefits with:

- A person with more than $500,000 in average adjusted nonfarm income will be ineligible for DP, CCP, ACRE, LDP/MLG, MILC, and the noninsured assistance program.
- A person with more than $750,000 average adjusted gross farm income will be ineligible for direct payments.
Allan’s Take

- Shift in funding toward non-production programs
- Shift in commodity programs towards more risk management
- ACRE may be a significant new program but could be very costly to taxpayers
- Unexpected consequences should be expected
‘08 Farm Bill

Standing Disaster Assistance

SUpplemental REvenue Assistance (SURE)

Defines “permanent” government response to disaster rather than having ad hoc legislation each time
Supplemental Revenue Assistance (SURE)

• Qualifying requires CAT, or higher, coverage on all eligible crops and NAP (Non-insured Assistance Plan) for uninsurable crops ($250/crop/county)
  
  Pasture is not included
  Crop less than 5% of total crop value
  NAP premium >10% value of coverage

• Insurance deadlines (wheat and hay)
Supplemental Revenue Assistance (SURE)

- Payment triggered by
  - Whole farm loss of 50% or larger, or
  - County is declared a disaster area (contiguous counties also qualify)

"Farming operation" – includes all crops, counties and states
SURE Revenue Guarantee

= Planted acres
X % crop insurance coverage
X APH or program yield
X Crop insurance price election
X 115% (to cover ins. deductible)
Capped at 90% of expected revenue of each crop
SURE Payment

( Guarantee level – Revenue to count) X 60%

Pays a maximum of 60% of the loss
Revenue to Count =

Sum of

Actual crop value (harvested acres X yield X marketing year price)

Crop insurance indemnities

Prevented planting payments

15% of direct, counter-cyclical, ACRE, and market loan payments
Some Potential Implications 
ala Carl Zulauf, Ohio State

1. Incentive to buy at least 75% level of individual crop insurance – stay below 90% cap
2. Benefits areas with variable yields (not Indiana) Losses are more likely
3. Crop insurance and NAP – must cover all crops on all farms
4. SURE favors single crop, not rotation
1. Determine your APH yields
   (10 years if possible)
2. Compare your yields and county yields (How well do they track each other?)
3. Get estimated ‘09 premiums for alternative insurances
   (Crop insurance agent or use farmdoc)
Home Work II

4. Get estimated long-term net costs of crop insurance coverages for your county (Use farmdoc)

5. How much ($/acre) is prevented planting/replant coverage worth to you?
Readings for Feb 10th

• Marketing Tab
  – Historical price tables
  – Cash market contracts
Course Website

- Login: margin
- Password: risk2009

- To email in questions, either give them to your host or send them to Corinne Alexander: [cealexan@purdue.edu](mailto:cealexan@purdue.edu)