

Managing Margin Risk

Session 2: February 3



Purdue Extension

Knowledge to Go

1-888-EXT-INFO



Overview

- Crop Insurance
- 2008 Farm Bill
- ACRE
- SURE

Managing Margin Risk Crop Insurance



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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**

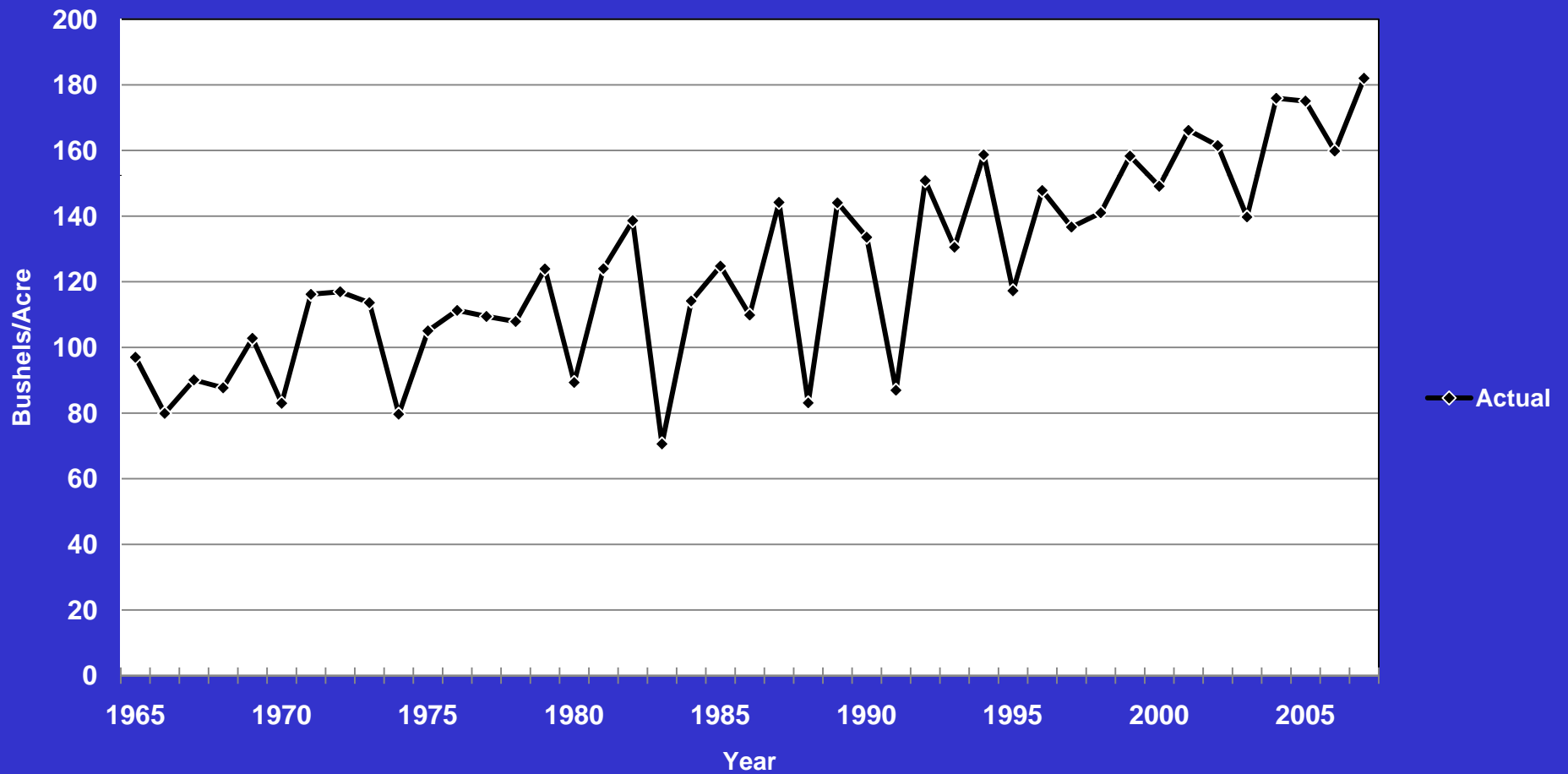
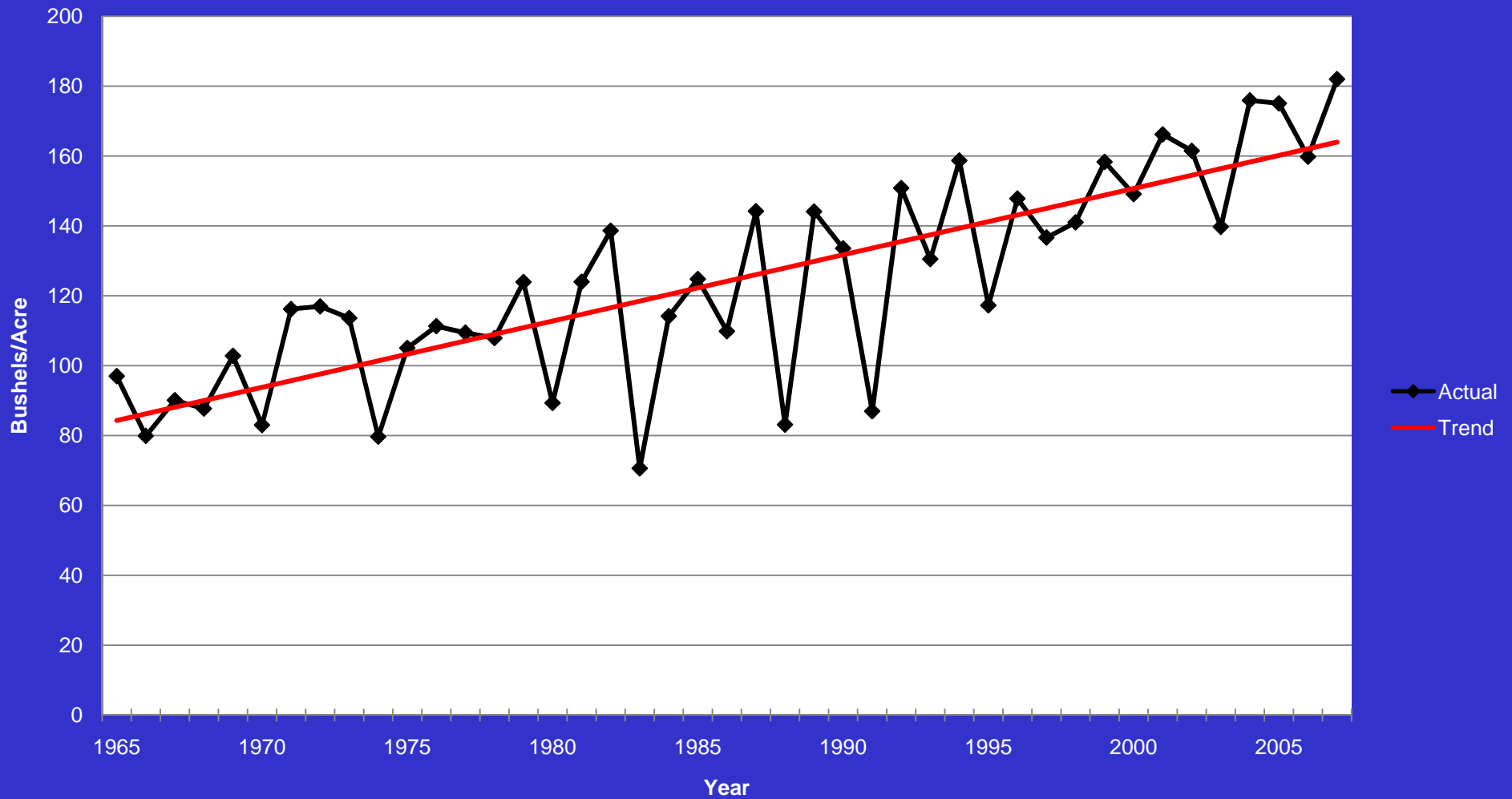
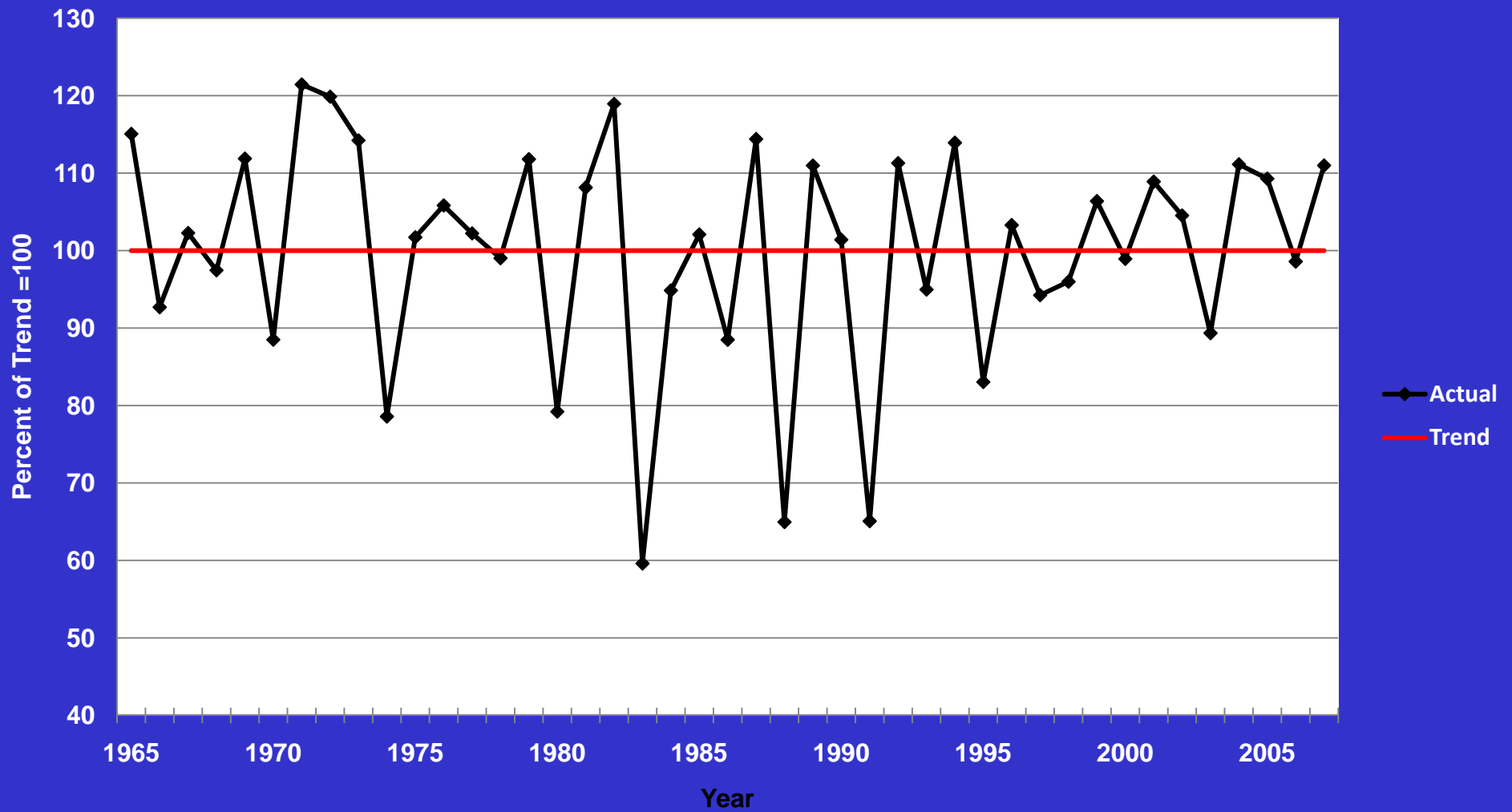


Figure 2. Actual and Trend Corn Yields in White County, 1965-07 (trend 1.9 bu./year)



**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 $75\% \times 142 = 106$ bu.

Producer harvests 90 bushels

106 bu. guarantee - 90 bu. yield = 16 bu.

16 bu. X $\$4.00 = \$64.00/\text{acre}$ 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)

X 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

$$\begin{aligned} ((128 - 90)/128) &= 29.7\% * \$500 \\ &= \$148.50 \end{aligned}$$

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

<u>Type of Insurance</u>	<u>Corn</u>		<u>Soybeans</u>	
	<u>% of insured acres</u>		<u>% of insured acres</u>	
	<u>'04</u>	<u>'08</u>	<u>'04</u>	<u>'08</u>
CAT	7.5	4.2	11.4	5.0
APH	9.1	8.0	21.2	8.8
CRC	15.8	27.4	30.6	11.4
IP	1.8	0.4	2.6	0.4
RA	49.7	35.3	18.8	48.4
GRP	6.2	7.2	7.0	9.8
GRIP	10.2	17.1	8.1	16.0
TOTAL ACRES (1,000)	3,623.0	3,913.1	3,259.6	3,625.3

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

FCIC and Spring CRC Prices

<u>Year</u>	<u>Corn</u>		<u>Soybeans</u>	
'06	2.00	2.38	5.15	6.25
'07	3.50	3.76	7.00	8.44
'08	4.75	4.78	11.50	11.85
'09	4.00	4.50?	9.00	10.25?

Premium Subsidies - 2009

c

Level of Insurance Coverage

Insurance	65%	70%	75%	80%	85%	90%
APH	0.59	0.59	0.55	0.49	0.38	NA
CRC/RA	0.59	0.59	0.55	0.49	0.38	NA
GRP	NA	0.59	0.59	0.55	0.55	0.51
GRIP	NA	0.59	0.59	0.55	0.49	0.44
Enterprise	0.80	0.80	0.77	0.68	0.53	NA

Est. 2009 Corn Premiums Adams County – 137 bu. APH

^c

%	APH	CRC	RA- BP	RA- HP	GRP	GRIP BP	GRIP HP
65%	5.17	10.33	6.50	9.35	NA	NA	NA
70%	6.88	13.90	9.49	13.74	3.25	7.27	7.70
75%	9.85	20.29	14.59	20.89	3.89	10.73	12.55
80%	14.61	30.77	22.91	32.45	6.50	15.51	18.99
85%	22.05	47.75	36.20	50.72	8.95	24.91	30.82
90%	NA	NA	NA	NA	14.00	37.23	45.93

Est. 2009 Soybean Premiums Adams County – 46 bu. APH

^c

%	APH	CRC	RA- BP	RA- HP	GRP	GRIP BP	GRIP HP
65%	3.69	8.09	5.32	9.35	NA	NA	NA
70%	5.24	11.39	7.81	13.74	2.09	9.32	10.11
75%	8.02	17.41	12.06	20.89	2.40	15.58	16.66
80%	12.66	27.63	18.95	32.45	3.28	21.76	23.06
85%	21.21	44.57	29.90	50.72	5.30	32.58	35.25
90%	NA	NA	NA	NA	9.53	43.36	49.78

Est. 2009 Corn Premiums

Bartholomew Co – 150 bu. APH

^c

%	APH	CRC	RA- BP	RA- HP	GRP	GRIP BP	GRIP HP
65%	5.54	11.13	6.98	10.23	NA	NA	NA
70%	7.36	14.98	10.21	14.78	2.89	6.18	7.76
75%	10.55	21.86	15.74	22.55	3.70	10.12	13.12
80%	15.64	33.17	24.72	35.03	5.85	15.92	19.71
85%	23.62	51.48	39.10	54.84	8.71	26.10	32.45
90%	NA	NA	NA	NA	14.50	39.67	49.25

Est. 2009 Soybean Premiums

Bartholomew Co – 49 bu. APH

^c

%	APH	CRC	RA- BP	RA- HP	GRP	GRIP BP	GRIP HP
65%	3.89	8.56	5.63	7.57	NA	NA	NA
70%	5.48	11.98	8.24	11.08	1.98	11.53	11.56
75%	8.34	18.27	12.68	17.03	2.31	17.97	18.27
80%	13.12	28.90	19.87	26.62	3.32	24.18	24.91
85%	20.92	46.62	31.35	41.78	5.43	35.98	37.75
90%	NA	NA	NA	NA	9.84	50.29	53.77

Est. 2009 Corn Premiums

Tippecanoe Co – 172 bu. APH

^c

%	APH	CRC	RA- BP	RA- HP	GRP	GRIP BP	GRIP HP
65%	5.43	11.42	6.97	10.32	NA	NA	NA
70%	7.27	15.44	10.47	15.32	3.44	6.03	8.36
75%	10.46	22.62	16.46	23.74	5.11	11.02	15.08
80%	15.56	34.47	26.22	37.38	7.52	17.03	22.36
85%	23.54	53.75	41.87	59.07	10.46	28.41	35.90
90%	NA	NA	NA	NA	16.09	43.32	54.01

Est. 2009 Soybean Premiums

Tippecanoe Co – 50 bu. APH

^c

%	APH	CRC	RA- BP	RA- HP	GRP	GRIP BP	GRIP HP
65%	5.43	11.42	6.97	10.32	NA	NA	NA
70%	7.27	15.44	10.47	15.32	3.44	6.03	8.36
75%	10.46	22.62	16.46	23.74	5.11	11.02	15.08
80%	15.56	34.47	26.22	37.38	7.52	17.03	22.36
85%	23.54	53.75	41.87	59.07	10.46	28.41	35.90
90%	NA	NA	NA	NA	16.09	43.32	54.01

**Figure 3. Actual Corn Yields as a Percent of Trend
White County 1965-07**

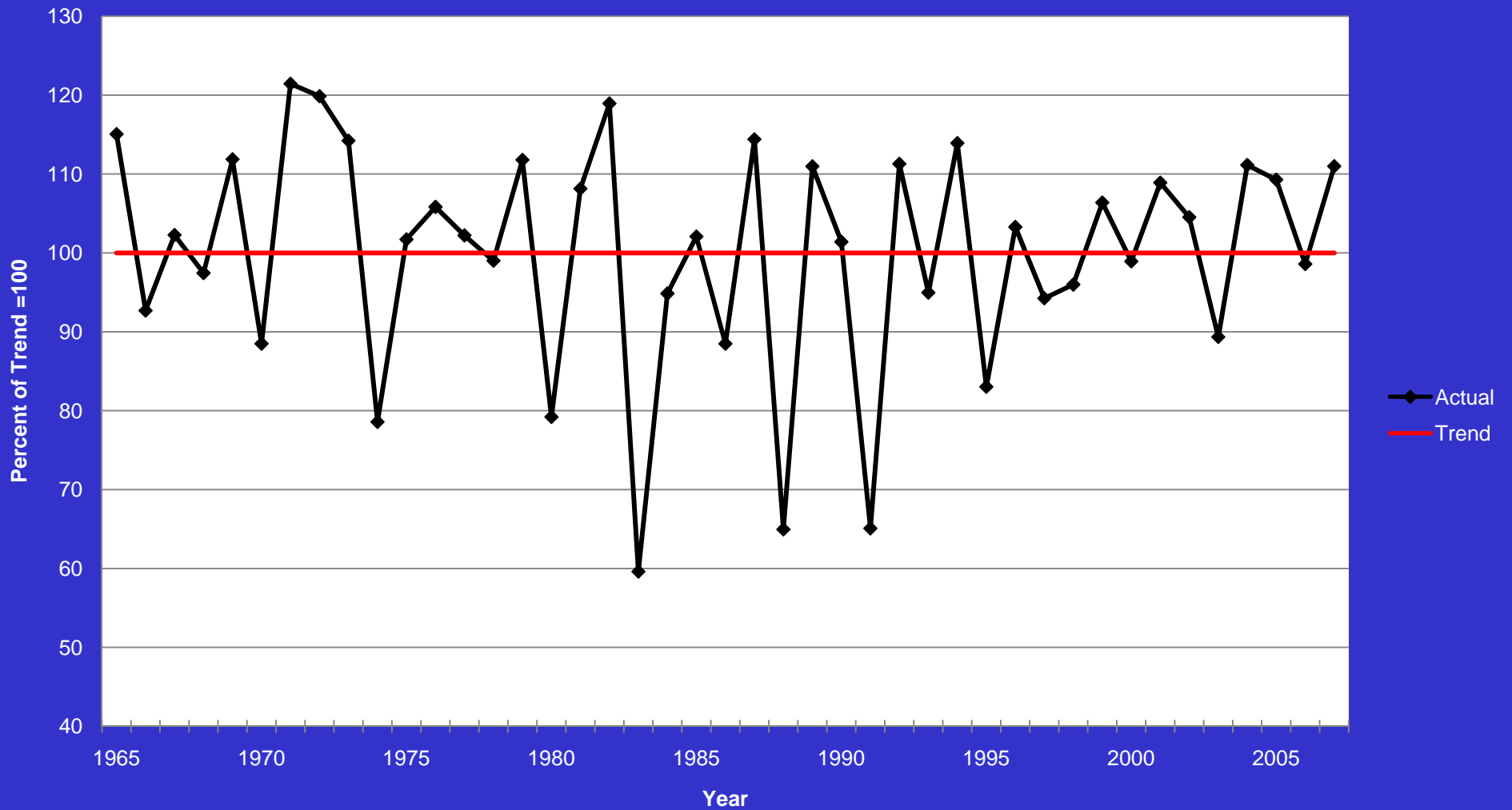
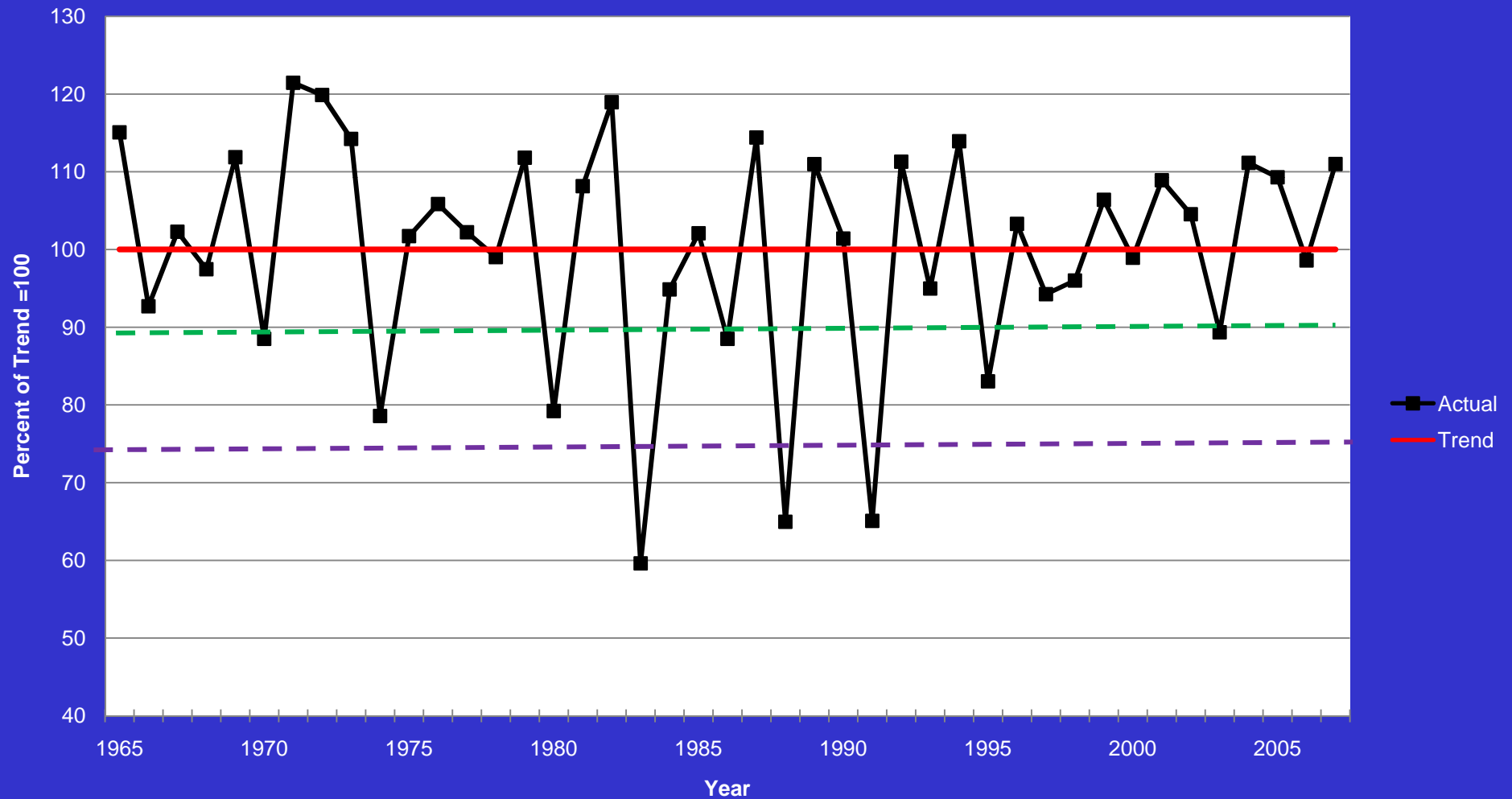
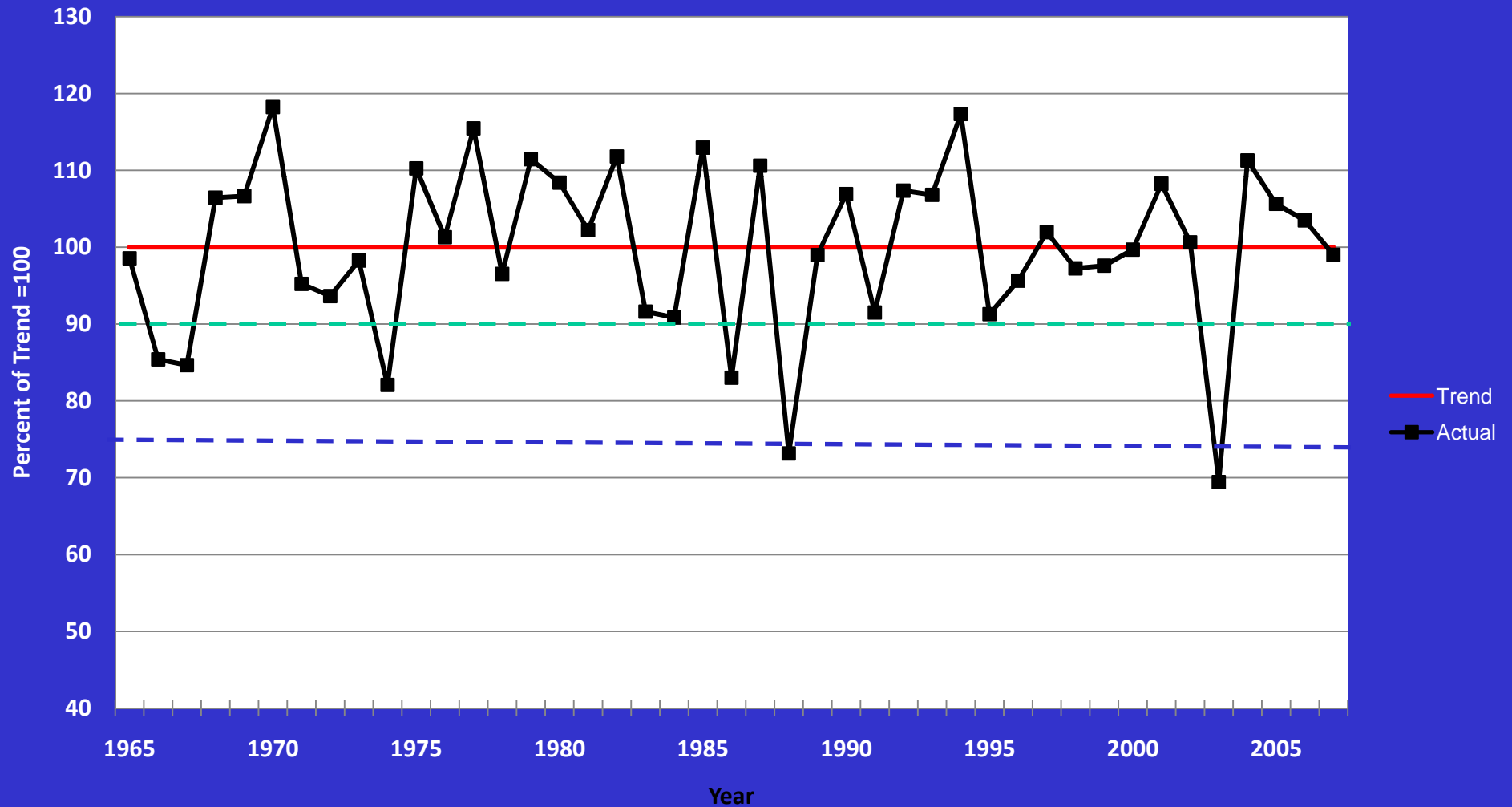


Figure 4. Actual County Corn Yields as Percent of Trend, White County, 1965-07



**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

'08 Est. Net Cost of Insurance Corn, Adams Co.- 149 bu. APH

^c

%	APH	CRC	RA- BP	RA- HP	GRP	GRIP BP	GRIP HP
65%	5.21	9.45	1.60	3.76	NA	NA	NA
70%	6.43	10.90	0.80	3.56	2.02	1.83	1.92
75%	8.43	13.50	0.82	4.67	2.19	1.86	3.34
80%	11.30	17.49	2.71	8.27	4.02	1.50	3.85
85%	15.64	24.95	8.48	17.01	5.85	3.70	7.20
90%	NA	NA	NA	NA	8.63	9.79	14.35

'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

<u>Product</u>	<u>65%</u>	<u>75%</u>	<u>85%</u>
APH	62.7	72.2	79.7
CRC	71.4	80.4	86.1

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

Overview (Cont.)

- 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

>

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

AND

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

>

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



ACRE Calculation Assumptions

- Carroll County Indiana
- Corn and Soybeans 900 ac each, wheat 200 ac
- DP Yields: 129, 40, and 59
- CCP Yields: 149, 46, and 68
- Average Yields: 160, 49, and 80
- 1000 combinations of prices and yields over 2008 to 2012 to understand risk management aspects of program

ACRE Calculation Assumptions

- **Alternative Price Pattern Assumptions**

- Flat prices:

- \$3.75 corn; \$8.80 Beans; \$5.50 Wheat

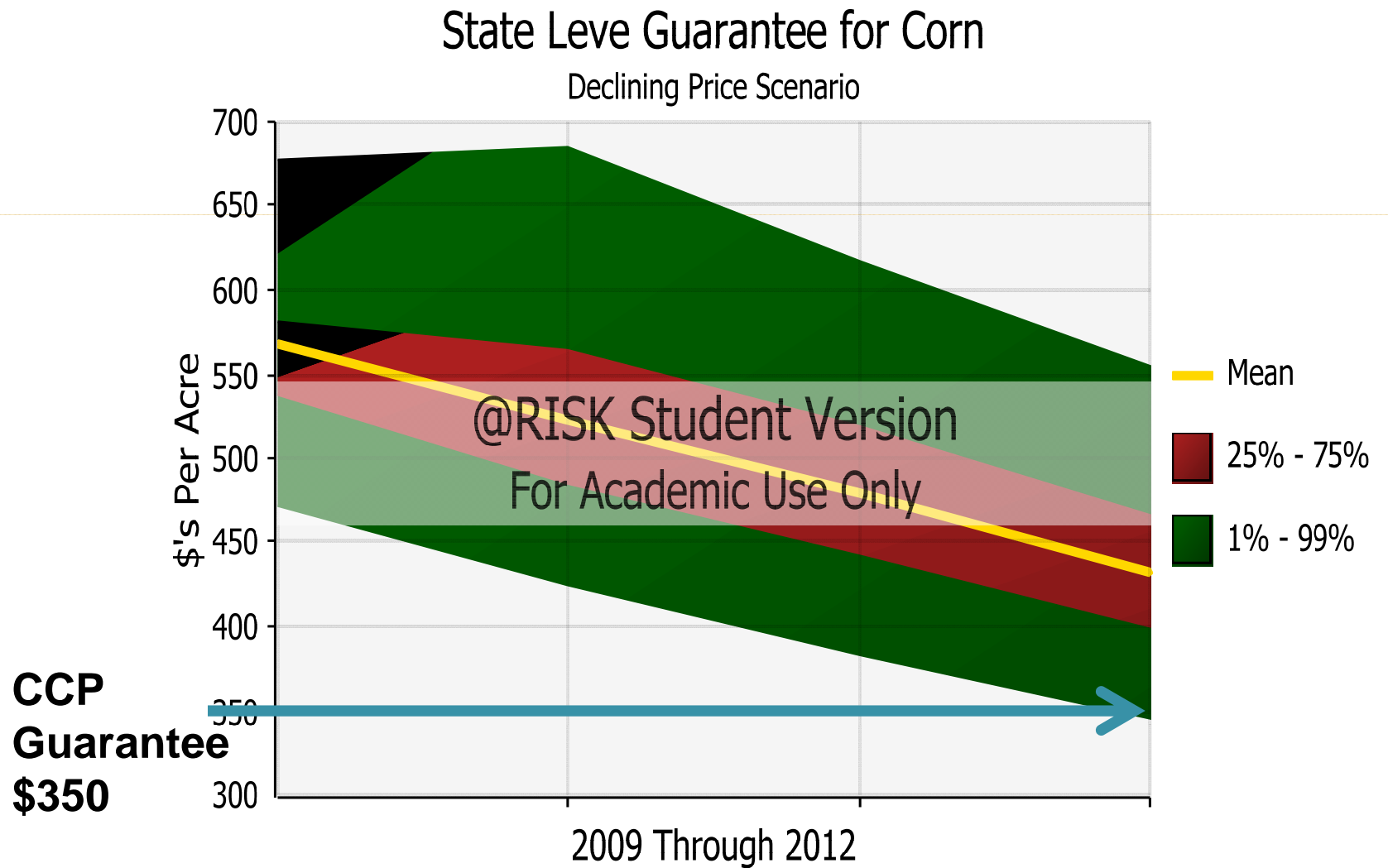
- Declining Prices:

- \$3.19 to \$1.65 corn; \$7.52 to \$3.93 beans; \$4.68 to 2.44 wheat

- Rising Prices and USDA price series

	2008	2009	2010	2011	2012
Corn	\$ 3.75	\$ 3.80	\$ 3.60	\$ 3.50	\$ 3.50
Soybeans	\$ 8.85	\$ 8.90	\$ 8.75	\$ 8.80	\$ 8.80
Wheat	\$ 5.50	\$ 5.00	\$ 4.65	\$ 4.50	\$ 4.50

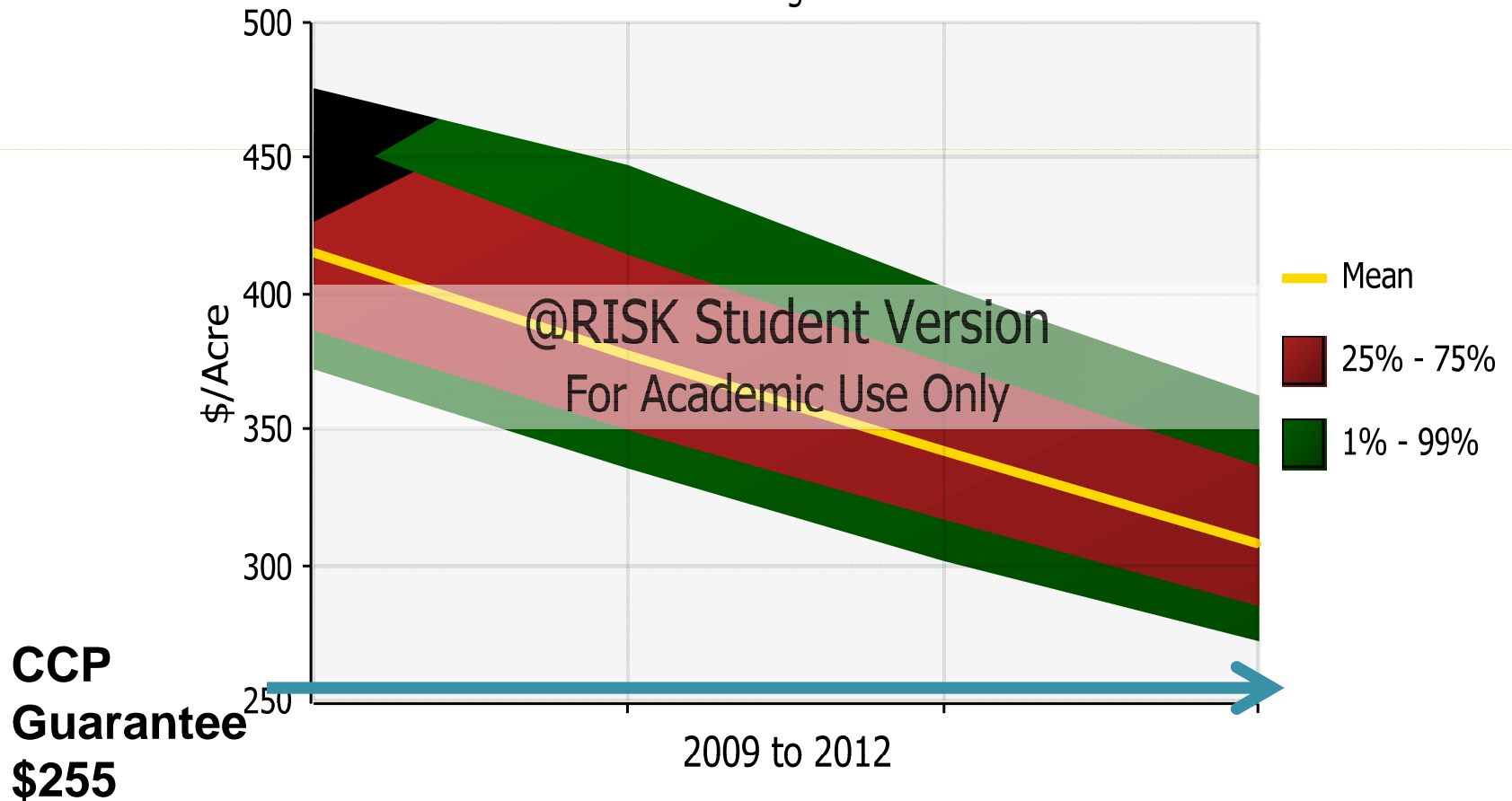
Comparison of State Level ACRE Guarantee and CCP Guarantee Corn in Indiana



Comparison of State Level ACRE Guarantee and CCP Guarantee Soybeans in Indiana

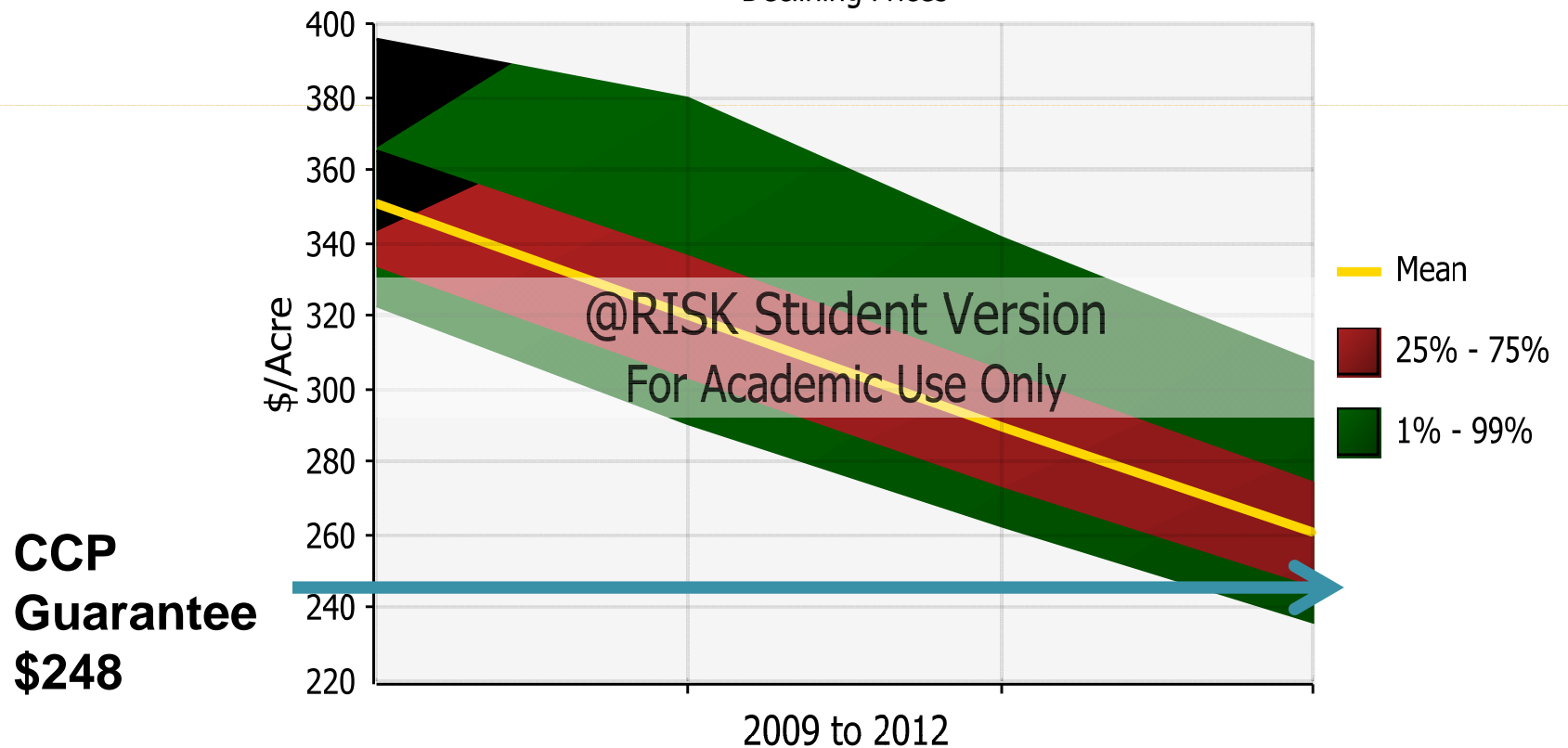
State Level Guarantee for Soybeans

Declining Prices



Comparison of State Level ACRE Guarantee and CCP Guarantee Soybeans in Indiana

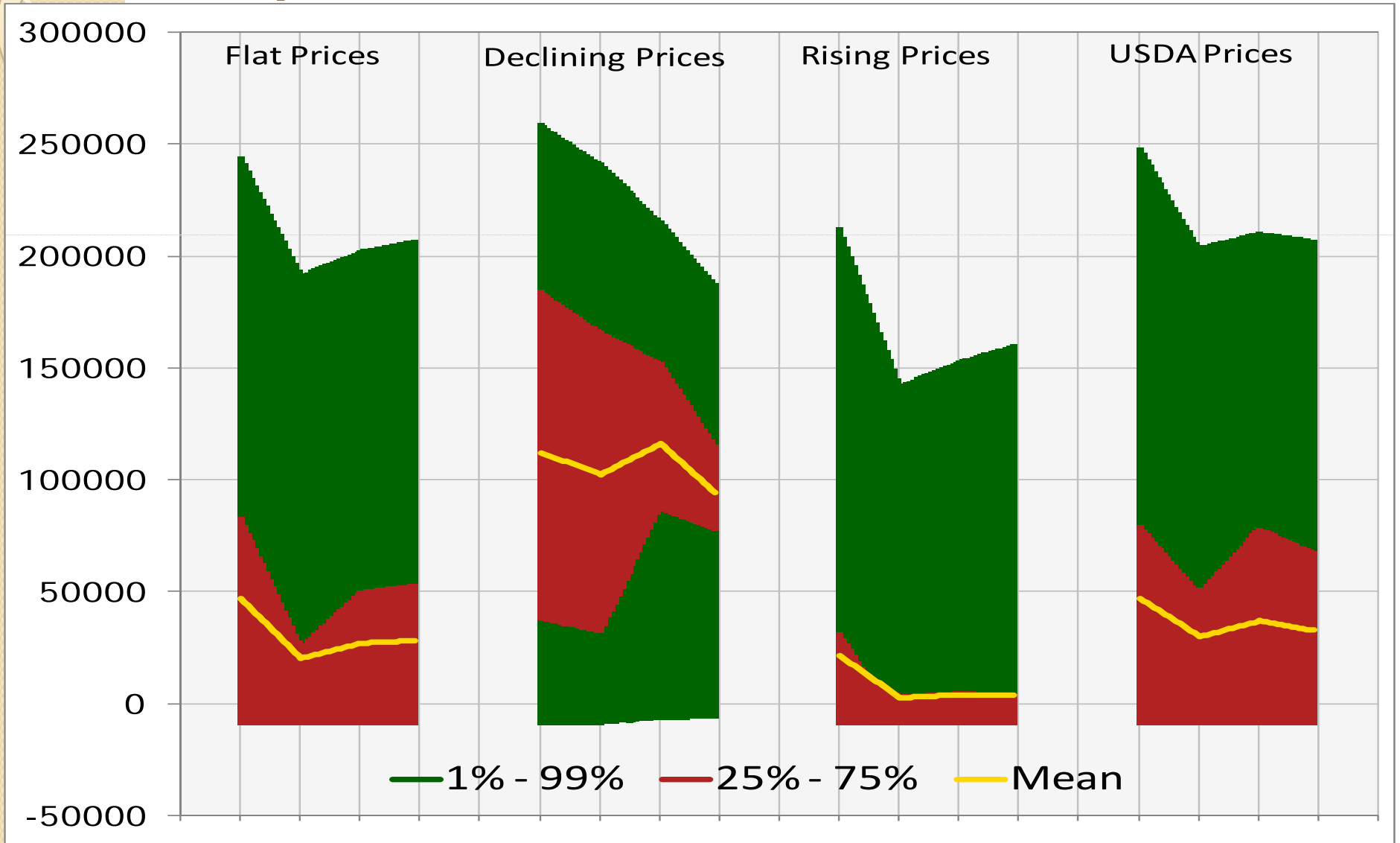
State Level Guarantee for Wheat
Declining Prices



ACRE: Initial thoughts

- Declining Prices Favor ACRE because of the 10% cap 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





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

Home Work – I

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

- <http://www.agecon.purdue.edu/extension/programs/marginrisk.asp>
- Login: **margin**
- Password: **risk2009**
- To email in questions, either give them to your host or send them to Corinne Alexander:
cealexan@purdue.edu