MAKING SOUND CROP INSURANCE DECISIONS

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Executive Summary

After attending this session, farmers will be able to more appropriately select the crop insurance products and coverage levels for their farm.

- The session will begin by discussing trends in crop insurance. We will show purchases of crop insurance products by coverage level. Overall, this material shows that farmers insure corn at higher coverage levels than soybeans.

- The impacts of Counter-Cyclical (CC) payments on crop insurance purchases will be discussed. CC payments are new under the 2002 Farm Bill and provide price protection. CC payments increase the attractiveness of yield insurance relative to revenue insurance.

- A *Premium Calculator* tool will be demonstrated. This tool is available in the crop insurance section of *farmdoc* (www.farmdoc.uiuc.edu). This tool shows premiums for all federally subsidized multi-peril insurance products at all coverage levels. The tool can be used to generate premium estimates for basic, optional and enterprise units.

- A *Payout Estimator* tool will be demonstrated. This tool shows how insurance products would have performed historically given that price and yield change occur like those for years between 1972 through 2001. This tool is a Microsoft Excel spreadsheet that includes examples for corn and soybeans for every county in Illinois.

- The *iFarm Insurance Evaluator* available at *farmdoc* will be demonstrated. This tool shows how crop insurance products are expected to perform on a case farm in each county in Illinois.

- Guidelines for crop insurance choice will be given. Revenue products without guarantee increases (IP, RA-BP) should be used by farmers that do not aggressively hedge crops prior to harvest. Revenue products with guarantee increases (CRC, RA-HP) should be used by farmers who hedge aggressively prior to harvest. County-level products (GRP, GRIP) are excellent choices for farms in strong financial position, and whose yields closely track their county yields.

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Making Sound Crop Insurance Decisions

By Gary Schnitkey, Bruce Sherrick, and Scott Irwin



http://www.farmdoc.uiuc.edu/

Overview of Workshop

- **Current trends in crop insurance**
- **Tools for evaluating crop insurance products**
  - ***Premium Calculator* on *farmdoc***
  - ***Payout Estimator* on CD**
  - ***Insurance Evaluator* on *farmdoc***

Trends

1. Movement towards revenue products

2. Low use of pre-harvest marketing

3. Introduction of Counter-cyclical payments (2002 Farm Bill)

Percent of Acres Insured by Crop Insurance Product and Coverage Level, Corn, Illinois, 2002

Coverage Level	Actual Production History	Income Protection	Revenue Assurance	Crop Revenue Coverage	Group Risk Plan	Group Risk Income Plan	Total
	---------- Percent of acres insured ----------						
Cat	14.1						14.1
50%	0.5	0.2		0.3			1.0
55%	0.1	0.0		0.1			0.2
60%	0.2	0.0		0.5			0.7
65%	4.0	0.8	2.2	3.8			10.8
70%	2.1	0.7	5.3	7.0			15.1
75%	4.0	4.5	9.0	11.1	0.1	0.1	28.8
80%	0.9		7.0	6.1	0.1	0.1	14.2
85%	0.4		6.2	4.3	0.3	0.1	11.3
90%					2.2	1.6	3.8
Total	26.3	6.2	29.7	33.2	2.7	1.9	100.0

67 Percent of the corn acres in Illinois are insured

Percent of Acres Insured by Crop Insurance Product and Coverage Level, Soybeans, Illinois, 2002

Coverage Level	Actual Production History	Income Protection	Revenue Assurance	Crop Revenue Coverage	Group Risk Plan	Group Risk Income Plan	Total
	---------- Percent of acres insured ----------						
Cat	23.0						23.0
50%	3.7	0.3		0.7			4.7
55%	0.2	0.0		0.1			0.3
60%	0.7	0.1		0.4			1.2
65%	6.9	1.2	2.7	3.6	0.1		14.5
70%	4.0	0.8	4.1	5.0	0.1		14.0
75%	7.2	4.2	5.1	7.0	0.1	0.1	23.7
80%	2.6		3.2	3.1	0.2	0.0	9.1
85%	1.4		2.5	2.6	0.3	0.0	6.8
90%					2.0	0.7	2.7
Total	49.7	6.6	17.6	22.5	2.8	0.8	100.0

64 percent of the soybean acres in Illinois are insured.

Source: U.S.D.A., Risk Management Agency

Most Farmers Hedge Little Prior to Harvest

Percent of crops sold in year of harvest

Region	Corn	Soybeans
Northern	20 %	21 %
Central	17	15
Southern	23	22

* FBFM data for 1995 through 2001.

Counter-Cyclical Program

	Corn	Beans	Wheat
Trigger Price	$2.32	$5.36	$3.34
- higher of season average price or loan rate	1.98	5.00	2.80
CC rate	.34	.36	.54

* National loan rate becomes $1.95 for corn, and $2.75 for wheat between 2004 and 2007

Season Average Price

- National price
- For corn and soybeans, based on marketings between September and August
- The 2002 season average prices will not be known for certain until Sept 2003
- For corn and soybeans, payments in October, February, and October

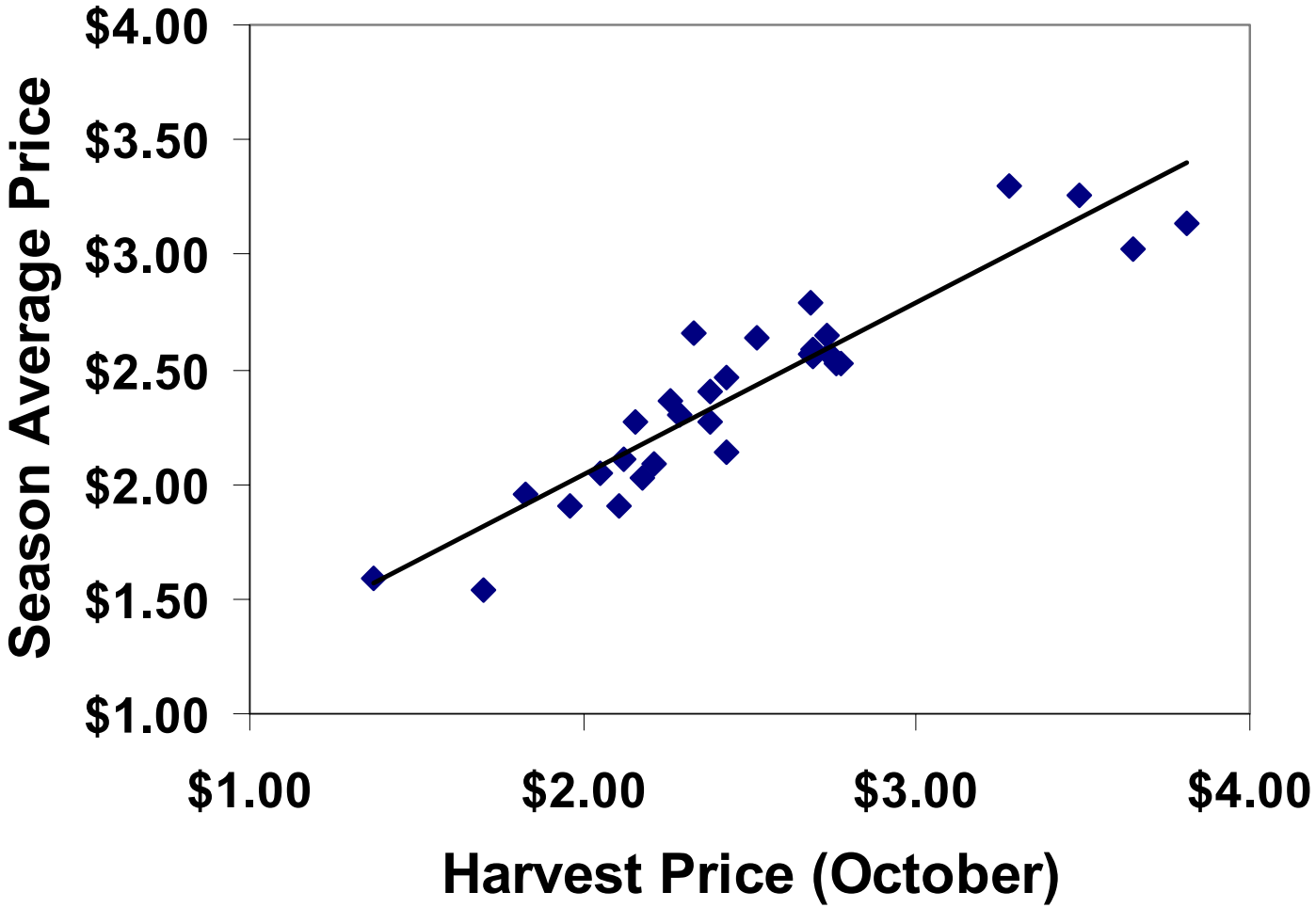
Related Season Average Prices to Futures Prices

- Chicago Board of Trade (CBOT) prices
  - December contract for corn
  - November contract for soybeans

- Examined relationship in fall and spring
  - Average of settlement prices during February for spring

  (Same prices used for insurance purposes)

Corn Season Average Price and Average CBOT Settlement Price in October, 1972 through 2002.



Chance of CC Payments, Corn, Given CBOT Futures in Spring

Dec. Futures Price	Expected CC Rate	CC Rate of: Equal to $.00	CC Rate of: $.00 and $.15	CC Rate of: More $0.15
		Percent of Time		
$1.75	$0.28	11	8	81
$2.00	$0.21	22	13	65
$2.25	$0.14	39	15	46
$2.50	$0.09	59	15	26
$2.75	$0.04	77	11	12

Chance of CC Payments, Beans, Given CBOT Futures in Spring

Nov. Futures Price	Expected CC Rate	CC Rate of: Equal to $.00	CC Rate of: $.00 and $.15	CC Rate of: More $0.15
		Percent of Time		
$4.75	$0.20	36	8	56
$5.00	$0.16	45	8	47
$5.25	$0.13	55	8	37
$5.50	$0.10	65	7	27
$5.75	$0.07	74	6	20

Current Trends

1. CC payments provide price protection

2. Enhance the attractiveness of yield products (APH, GRP)

3. Lessen need to pre-harvest hedge (However, most farmers don't hedge enough)

Premium Calculator

- **Available in crop insurance section of *farmdoc* (www.farmdoc.uiuc.edu)**

- **Calculates premiums for:**
  - **All multi-peril products**
  - **All coverage levels**
  - **Basic, optional, enterprise units**

2002 *iFARM* Crop Insurance Premium Calculator: North Central Region Crops

iFARM

Credits

Make the selections for your search:

Illinois

Jefferson

Corn

APH Yield

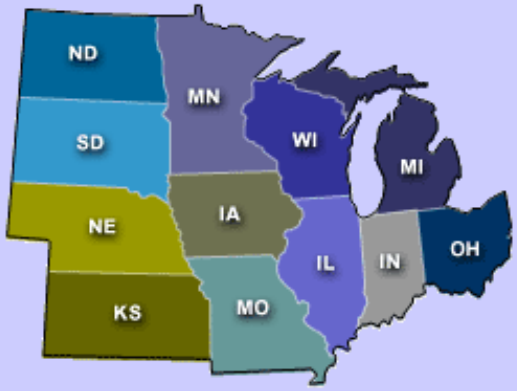
120

(Actual Production History Yield) in bu./acre

Submit

Last Updated: 3/07/2002

Making the following selections and clicking on "SUBMIT" will provide estimated insurance premiums per acre. These are not quotes. A number of assumptions had to be made to estimate the following per acre premium. These assumptions will not be applicable to all forms. Actual quotes must be obtained from qualified insurance agents.



Click any state above for a detailed image of it's counties.

Premium Per Acre for Jefferson County, Illinois, 2003

(Crop = Corn, APH Yield = 120 bu., Unit = Basic, Protection Level = 100%, and Practice = non-irrigated)

iFARM

Print Preview

Coverage Level	APH ($/acre)	RA-BP ($/acre)	RA-HP ($/acre)	CRC ($/acre)	GRP ($/acre)	GRIP ($/acre)
50%	1.58			2.29		
55%	2.06			3.00		
60%	2.51	2.71	3.61	3.71		
65%	3.53	3.97	5.23	5.27		
70%	4.62	5.02	6.54	6.92	2.49	2.41
75%	6.88	6.85	8.85	10.26	3.44	3.55
80%	10.76	9.70	12.45	15.97	5.13	5.67
85%	17.17	14.01	17.86	25.26	6.62	7.66
90%					9.34	11.03

To generate a new table, select the variables below and click here Recalculate

County	Crop	APH Yield	Unit	Protection Level	Practice
Select County	Select Crop	120	Basic	100	Select Practice

Basic
Optional
Enterprise

Disclaimer:

The above are estimated insurance premiums per acre. These are not quotes. A number of assumptions had to be made to estimate the per acre premiums. These assumptions will not be applicable to all farms. Actual quotes must be obtained from qualified insurance agents

Premium Per Acre for Jefferson County, Illinois, 2003

(Crop = Corn, APH Yield = 120 bu., Unit = Basic, Protection Level = 100%, and Practice = non-irrigated)

iFARM

Print Preview

Coverage Level	APH ($/acre)	RA-BP ($/acre)	RA-HP ($/acre)	CRC ($/acre)	GRP ($/acre)	GRIP ($/acre)
50%	1.58			2.29		
55%	2.06			3.00		
60%	2.51	2.71	3.61	3.71		
65%	3.53	3.97	5.23	5.27		
70%	4.62	5.02	6.54	6.92	2.49	2.41
75%	6.88	6.85	8.85	10.26	3.44	3.55
80%	10.76	9.70	12.45	15.97	5.13	5.67
85%	17.17	14.01	17.86	25.26	6.62	7.66
90%					9.34	11.03

To generate a new table, select the variables below and click here Recalculate

County	Crop	APH Yield	Unit	Protection Level	Practice
JEFFERSON	Corn	120	Enterprise	100	non-irrigated

Acre: 550.0 & Above ac Section: 5

Disclaimer:

The above are estimated insurance premiums per acre. These are not quotes. A number of assumptions had to be made to estimate the per acre premiums. These assumptions will not be applicable to all farms. Actual quotes must be obtained from

Premium Per Acre for Jefferson County, Illinois, 2003

(Crop = Corn, APH Yield = 120 bu., Unit = Enterprise, Protection Level = 100%, and Practice = non-irrigated)

iFARM

Print Preview

Coverage Level	APH ($/acre)	RA-BP ($/acre)	RA-HP ($/acre)	CRC ($/acre)	GRP ($/acre)	GRIP ($/acre)
50%				1.93		
55%				2.54		
60%		2.10	2.87	3.13		
65%		3.21	4.31	4.45		
70%		4.19	5.55	5.84		
75%		5.85	7.68	8.66		
80%		8.46	10.99	13.48		
85%		12.40	15.99	21.33		
90%						

To generate a new table, select the variables below and click here Recalculate

County	Crop	APH Yield	Unit	Protection Level	Practice
Select County	Select Crop	120	Basic	100	Select Practice

Disclaimer:
The above are estimated insurance premiums per acre. These are not quotes. A number of assumptions had to be made to estimate the per acre premiums. These assumptions will not be applicable to all farms. Actual quotes must be obtained from qualified insurance agents.

Payout Estimator

- Microsoft Excel spreadsheet that shows payouts for different insurance products by county.

- Packet will describe *Payout Estimator*

Multi-Peril Insurance for Corn, Soybeans

1. Farm products
   - Actual Production History (APH)
   - Income Protection (IP)
   - Revenue Assurance (RA)
   - Crop Revenue Coverage (CRC)
2. County level products
   - Group Risk Plan (GRP)
   - Group Risk Income Plan (GRIP)

Farm Insurance Products

1. Yield insurance
   -- Actual Production History (APH)
2. Revenue without guarantee increase
   -- Income Protection (IP)
   -- Revenue Assurance -- Base Price (RA-BP)
3. Revenue with guarantee increase
   -- Crop Revenue Coverage (CRC)
   -- Revenue Assurance -- Harvest Price (RA-HP)

APH Yield Guarantee

APH yield	140 bu.
Yield election	75%
Price	$2.00
Yield guarantee (140 bu. X .75)	105 bu.

APH Indemnity Payment

Yield guarantee	105 bu.
Indemnity price	$2.00
Actual yield	100 bu.
Payment	$10 **

**$30.75 = (105 guarantee – 100 bu yield) x 2.00

IP (RA-BP) Revenue Guarantee

APH yield	140 bu.
Base price	$2.32
Coverage level	75 %

Revenue guarantee $243

(140 bu. x $2.32 x .75)

Prices for Revenue Insurance Products

"Base" Prices:

Corn -- CBOT Dec. contract avg. in February

Soybeans -- CBOT Nov. contract avg. in Feb.

"Harvest" Prices:

Corn -- CBOT Dec. avg in October (CRC) and November (RA, GRIP)

Soybeans -- CBOT Nov. contract avg. in October

IP (RA-BP) Gross Revenue

Harvest price	$2.05
Actual yield	100 bu.
Gross revenue	$205 **

** $205 = $2.05 x 100 bu.

IP (RA-BP) Indemnity Payment

Revenue guarantee	$243
Gross revenue	$205
Indemnity payment	$48 **

** (revenue guarantee – gross revenue)

Crop Revenue Coverage Revenue Assurance – Harvest Price

- Revenue insurance (pays when below a revenue guarantee)
- Increase in revenue guarantee
- Increase in guarantee good for "aggressive" users of forward contracts or futures contracts

CRC (RA-HP) Revenue Guarantee

APH yield	140 bu.
Base price	$2.32
Coverage level	75 percent

Revenue guarantee (harvest price < $2.32)

$243 = 140 bu. x $2.32 x .75

Revenue guarantee (harvest price > $2.32)

Harvest price = $2.80

$294 = 140 bu. x $2.80 x .75

CRC (RA-HP) Gross Revenue and Payment

Harvest price	$2.00
Actual yield	100 bu.
Gross revenue	$200
Revenue guarantee	$243
Payment (243 –200)	$43

CRC (RA-HP) Gross Revenue and Payment

Harvest price	$2.80
Actual yield	100 bu.
Gross revenue	$280
Revenue guarantee	$294
Payment (294 –280)	$14

Group Risk Plan (GRP)

Crop:	Corn
County:	Jefferson
Expected county yield:	97.6 bu.
Maximum protection level:	$256
Yield election:	90%
Protection level:	$256
Yield guarantee:	87.8 (97.6 x .90)

GRP Indemnities

Yield guarantee:	87.8 bu
Protection level:	256
Actual county yield:	80 bu.

Indemnity payment: $23

$256 x (87.8 - 80) / 87.8

Protection level x percent shortfall

Group Risk Income Plan (GRIP)

Crop:	Corn
County:	Jefferson
Expected county yield:	97.6 bu.
Expected price:	$2.32
Coverage level:	90%
Revenue guarantee:	$203

($203 = 97.6 bu. x 2.32 x .9)

GRIP Payment

Protection level:	$376
Revenue guarantee	$215
County yield:	80
Harvest price:	$2.05
Gross revenue:	$164
Indemnity payment:	$72

$376 x (203 – 164)/203

protection level x revenue shortfall

Insurance Evaluator

- Available on *farmdoc* in the crop insurance section
- Shows an evaluation of farm level products for one example farm in the county
- Compares risks and returns of the products.

Individual Workshop packets distributed at each Meeting Location….

(a few examples from Sangamon County included in proceedings)

Farm-level Analysis (simulation)

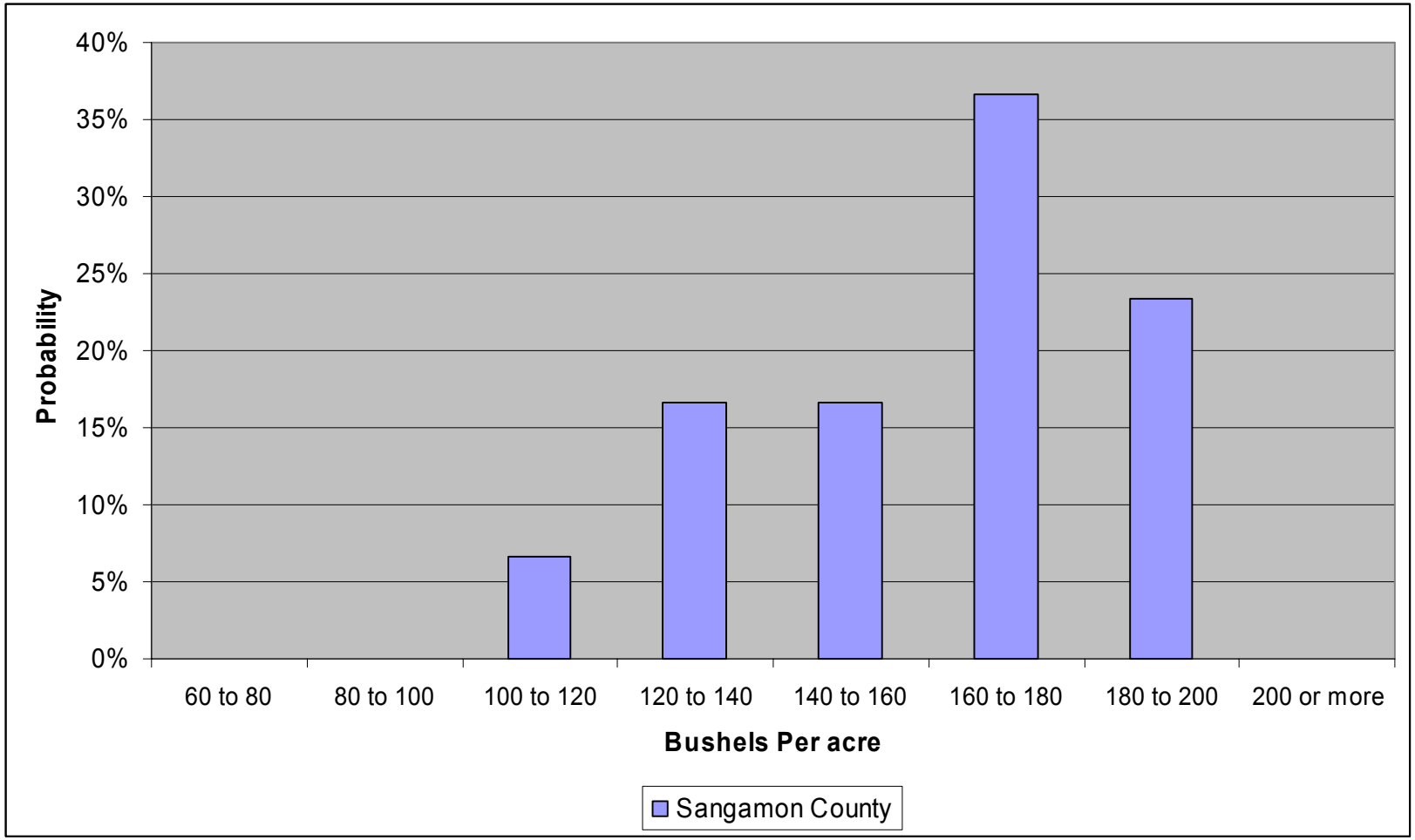
Needed items:

- Yield distribution for farm/county
- Price distribution for harvest
- Yield-Price Relationships
- Insurance elections, local conditions (e.g., basis)

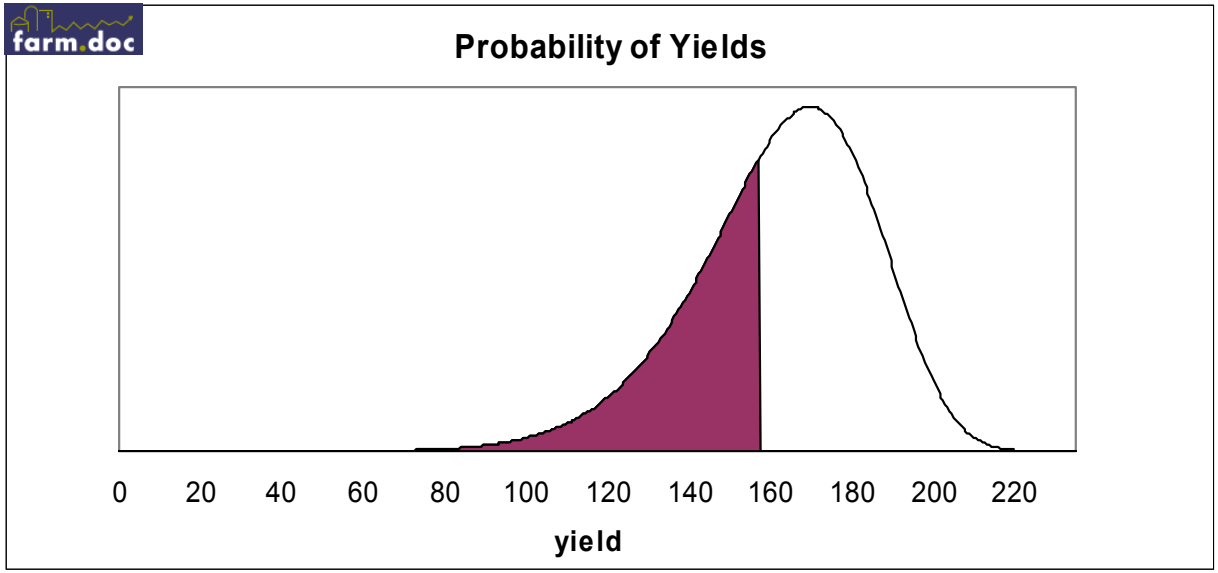
"It's tough to make predictions, especially about the future."

-- Yogi Berra

Historic Yields – Sangamon County Illinois



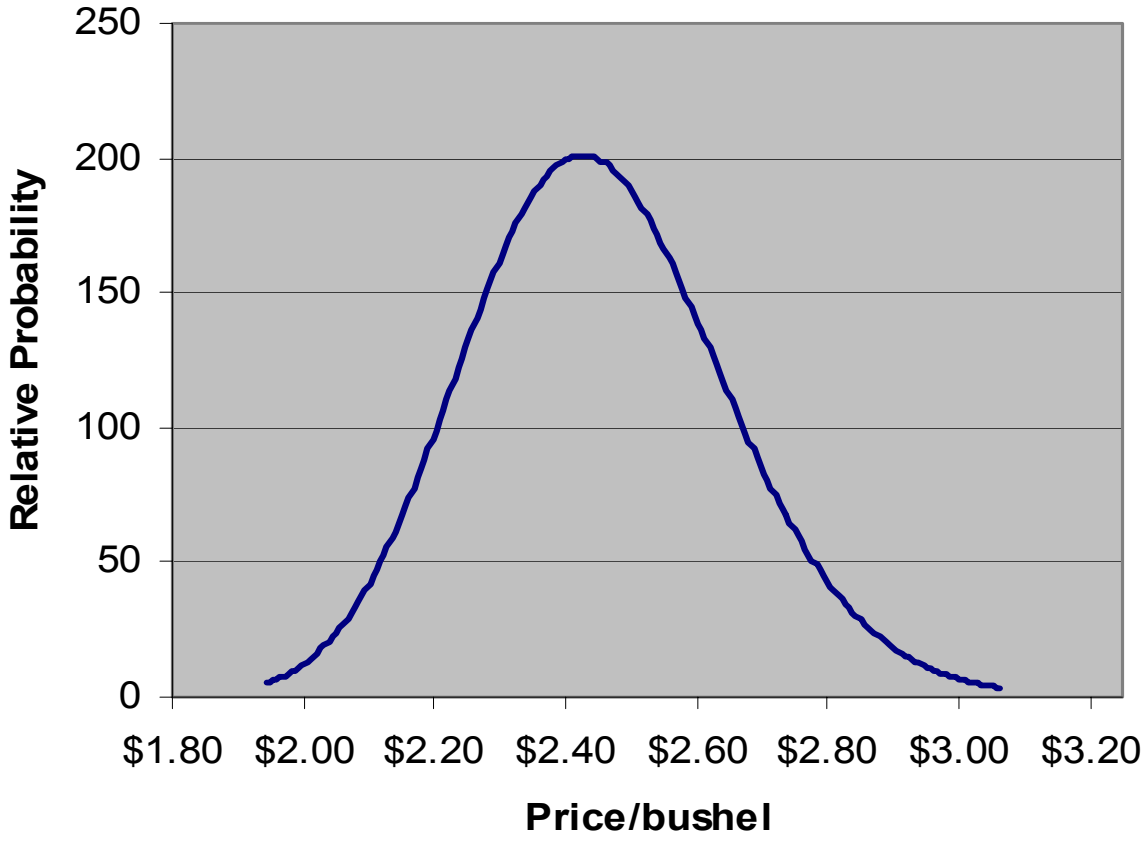
Sangamon County farm *(see FAST tool)*



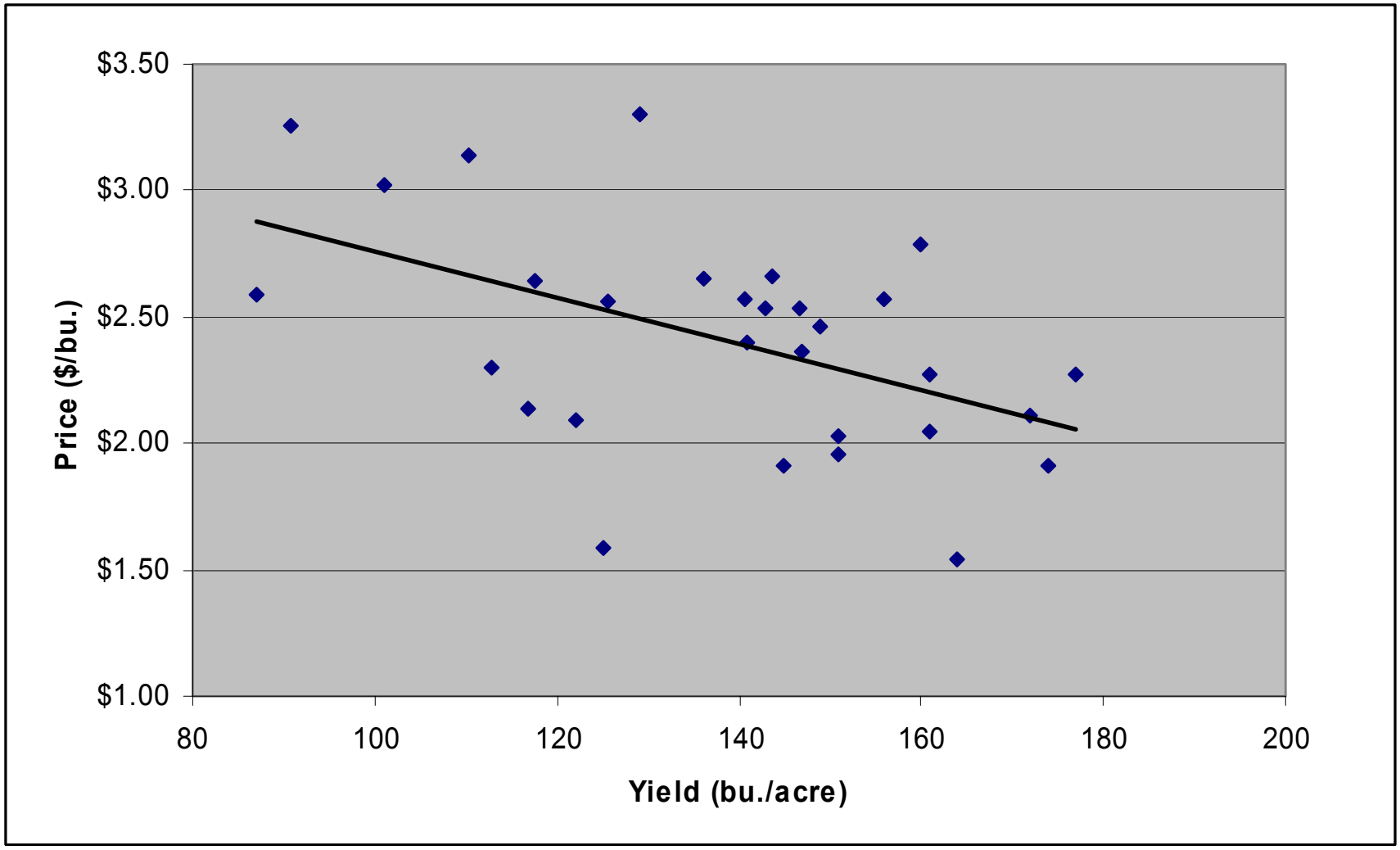
The fitted distribution for this county has an average yield of **162.76** and a standard deviation of **17.48**

	farmer	county	Probability:			
prob	VAR	VAR	YIELDS	Below	Above	APH level
0.1	133.20	139.45	81.382	0.1%	99.9%	50%
0.15	139.93	144.91	105.796	1.4%	98.6%	65%
0.2	145.07	149.04	113.934	2.6%	97.4%	70%
0.25	149.32	152.44	122.073	4.8%	95.2%	75%
0.3	153.02	155.38	130.211	8.3%	91.7%	80%
0.35	156.34	158.00	138.349	13.7%	86.3%	85%
0.6	170.36	168.94	133.466	10.2%	89.8%	***82.00%***

Prices from futures/options markets, adjusted for local basis



Historic Price vs. Yields – Sangamon County



Putting it all together…

See Handout for Location-Specific Information

http://www.farmdoc.uiuc.edu/cropins/evaluator/index.asp

Case Farm Description, Sangamon

farm.doc

Print View

2002 *iFARM* Crop Insurance Evaluator: Illinois

iFARM

County: SANGAMON	Crop: Corn		Farm Yield	County Yield
Farm Average Yield	162.59 bu./acre		bu./acre	bu./acre
Farm St. Dev. of Yield	23.74 bu./acre	30% of years yields below:	151.98	154.56
County Average Yield	162.59 bu./acre	20% of years yields below:	143.47	147.78
County St. Dev. of Yield	18.76 bu./acre	10% of years yields below:	130.83	137.54
Average Futures Price	$2.33 /bu	5% of years yields below:	119.76	128.39
St. Dev. of Price	$0.43 /bu	Farm APH	163 bu./acre	
Local Cash Basis	$0.34 /bu	Average Gross Crop Rev.	$344.59 /acre	

Comparison of crop insurance premiums - Sangamon

Estimated Premiums - $/Per acre

Coverage Election	APH	CRC	RA-BP	GRP	GRIP
55%	$1.28	$2.11	$0.59		
60%	$1.56	$2.61	$1.21		
65%	$2.20	$3.72	$2.27		
70%	$2.88	$4.87	$3.37	$1.18	$1.21
75%	$4.29	$7.21	$5.14	$1.69	$1.77
80%	$6.71	$11.23	$7.93	$2.68	$3.79
85%	$10.71	$17.89	$12.21	$4.03	$6.47
90%				$6.63	$11.16

This table contains estimates of the farmer paid per acre premium costs of various crop insurance products by coverage election level to help provide a sense of the differences in costs among insurance alternatives. Actual premiums may vary slightly, and other unit and practice options may exist. A qualified insurance agent should be consulted for actual crop insurance quotes.

Comparison of crop insurance payments - Sangamon

Average Insurance Payments/Acre

Coverage Election	APH	CRC	RA-BP	GRP	GRIP
55%	$0.08	$0.14	$0.05		
60%	$0.17	$0.35	$0.18		
65%	$0.37	$0.81	$0.47		
70%	$0.74	$1.83	$1.17	$0.65	$0.61
75%	$1.42	$3.69	$2.48	$1.33	$1.73
80%	$2.64	$6.82	$4.71	$2.59	$4.24
85%	$4.66	$11.80	$8.31	$4.82	$8.70
90%				$8.57	$15.53

This table shows the average per acre indemnity payments by product and election level under the assumptions of the case farm described above. Payments can vary significantly from year to year depending on prices and yields, with many years generating no payments, and some years generating much higher payments. The averages shown are the long run values that would be expected to occur when averaged over a large number of years.

Comparison of crop insurance payment likelihoods Sangamon

Frequency of payment

Coverage Election	APH	CRC	RA-BP	GRP	GRIP
55%	0.4%	0.6%	0.3%		
60%	0.8%	1.5%	1.1%		
65%	1.7%	3.4%	2.4%		
70%	3.0%	6.8%	5.2%	1.4%	1.8%
75%	5.5%	11.8%	9.0%	2.8%	4.8%
80%	9.6%	19.5%	15.0%	5.4%	10.3%
85%	15.6%	30.0%	23.3%	9.9%	18.3%
90%				17.2%	29.0%

This table indicates the frequency, or percentage of years that each crop insurance option would make an indemnity payment. An entry of 15%, for example, indicates that the crop insurance product would have a payment triggered in 15 out of 100 years. A higher percentage indicates that the product generates a payment to the producer more often than one with a lower percentage.

Comparison of crop insurance net costs - Sangamon

Estimated Net Average Cost of Insurance

Coverage Election	APH	CRC	RA-BP	GRP	GRIP
55%	-$1.20	-$1.97	-$0.54		
60%	-$1.39	-$2.26	-$1.03		
65%	-$1.83	-$2.91	-$1.80		
70%	-$2.14	-$3.04	-$2.20	-$0.53	-$0.60
75%	-$2.87	-$3.52	-$2.66	-$0.36	-$0.04
80%	-$4.07	-$4.41	-$3.22	-$0.09	$0.45
85%	-$6.05	-$6.09	-$3.90	$0.79	$2.23
90%				$1.94	$4.37

Over many years, payments from crop insurance will offset part or all of their premium costs. This table shows the net cost of insurance products found by combining the premium costs with information about frequency and amount of payments (previous tables). Negative entries indicate that the insurance costs more on average than it pays back. Positive entries indicate that the insurance actually pays back more over the long run than it costs. Note that in this case, higher coverage (lower subsidy rates) result in higher net costs for individual products and lower net costs (positive payments) for group products.

Comparison of revenue - Sangamon

Average Gross Revenue/Acre

Coverage Election	APH	CRC	RA-BP	GRP	GRIP
55%	$343.40	$342.63	$344.06		
60%	$343.21	$342.33	$343.56		
65%	$342.76	$341.69	$342.80		
70%	$342.46	$341.55	$342.40	$344.06	$343.99
75%	$341.73	$341.07	$341.93	$344.23	$344.56
80%	$340.53	$340.19	$341.38	$344.50	$345.04
85%	$338.55	$338.50	$340.70	$345.38	$346.82
90%				$346.53	$348.96

Average Gross Rev/Acre without insurance	***$344.59***

Average Gross Revenues are estimated assuming all the crop is sold at harvest. Gross Revenue equals crop sales plus any LDP payments, plus insurance proceeds, less insurance premium costs.

Comparison of value-at-risk - Sangamon

VAR at 0.05

Election	APH	CRC	RA-BP	GRP	GRIP
55%	$255.13	$254.47	$255.65		
60%	$254.99	$254.64	$255.64		
65%	$254.96	$255.28	$255.88		
70%	$256.11	$259.16	$256.71	$257.01	$256.93
75%	$257.80	$263.37	$259.97	$256.99	$257.50
80%	$258.84	$268.66	$264.60	$257.70	$259.53
85%	$261.50	$273.07	$272.39	$260.00	$262.38
90%				$262.65	$266.25

5%	Value at risk without insurance	***256.24***

This table contains a measure that helps evaluate the risk reduction associated with each product. The entries in the table are the 5% values at risk which indicate the level of revenue with outcomes at or below in 5% of the years (e.g., a one in twenty risk). Higher VARs are preferred as they indicate more of the low revenues have been eliminated by the insurance product.

Summary

- **CRC and RA-HP for farmers that aggressively hedge pre-harvest (30% or more of harvest)**

- **RA-HP for those that don't aggressively hedge**

Summary

- **GRP and GRIP for farmers in strong financial position**

- **GRP appears to be a good product for farmers that get an individual product at a low coverage level**