What Coverage Fits My Farm?

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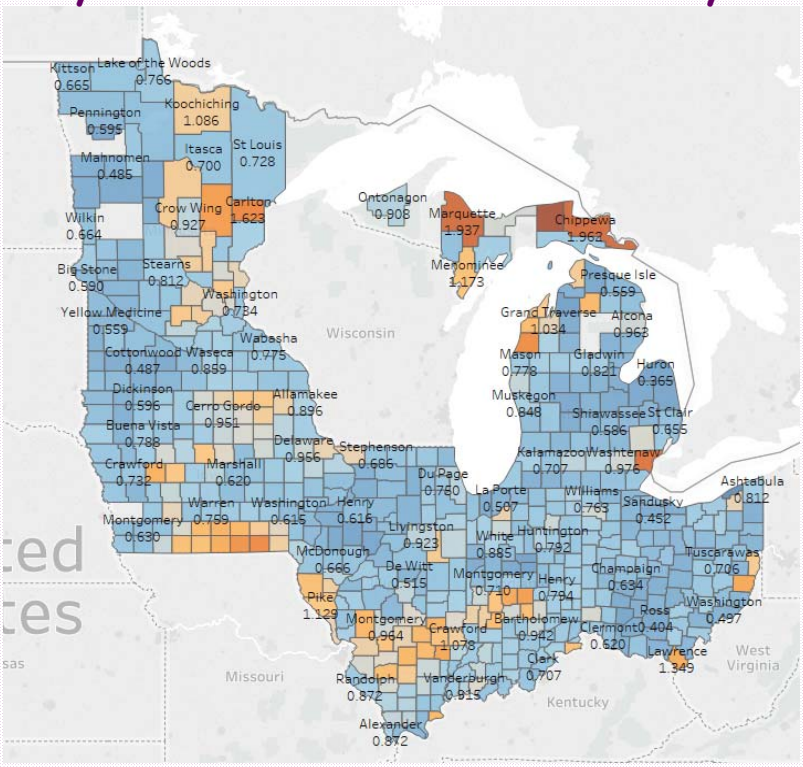
Why has Crop Insurance Changed from an Unpopular Policy to the Farmer Preferred Policy?

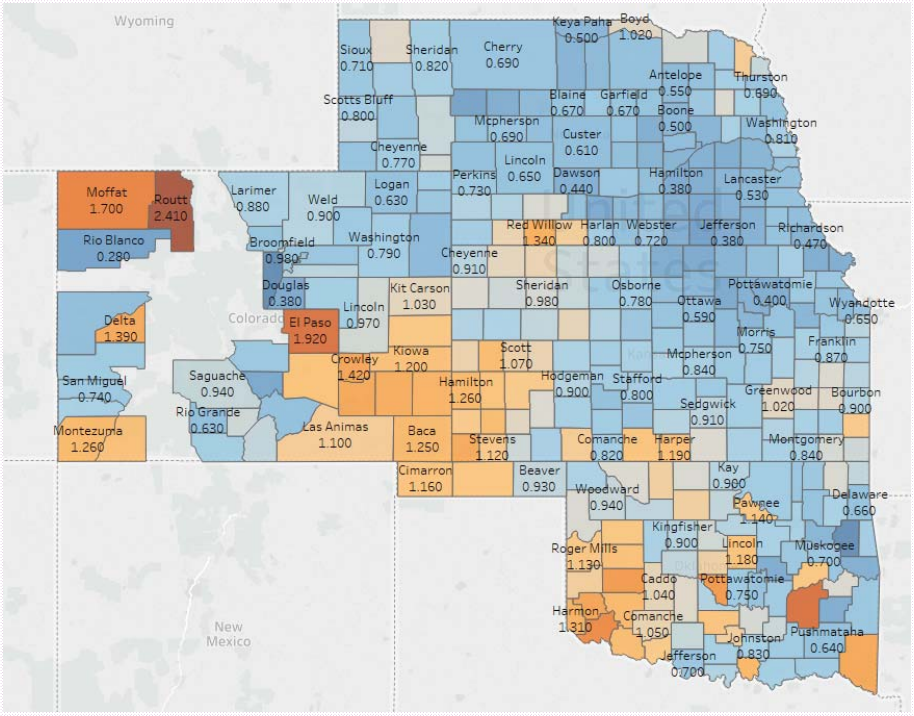
1. Crop insurance is the safety net Farmers want protected.
2. The number of insured farms has greatly increased.
3. This growth has not been at the expense of actuarial soundness.

Year	1980	1989	2017
Liability	3,010,419,814	13,535,800,082	106,097,958,696
Premium	156,464,675	814,301,684	10,073,629,307
Subsidy		204,964,872	6,356,302,893
Indemnities	342,625,586	1,212,234,703	5,373,465,552
Loss Ratio	2.19	1.49	0.53

Why has Crop Insurance Changed from an Unpopular Policy to the Farmer Preferred Policy?



Why has Crop Insurance Changed from an Unpopular Policy to the Farmer Preferred Policy?

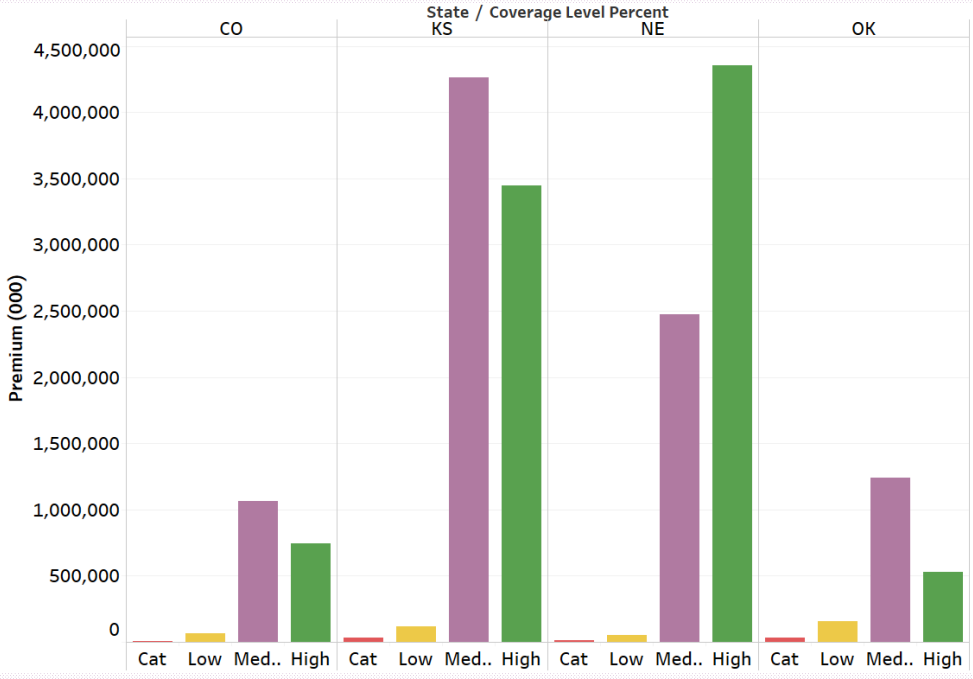


Buy Highest Coverage to Maximize Subsidy?

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%, Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80

	70%	75%	80%	85%
Price Election	$3.96	$3.96	$3.96	$3.96
Coverage - $/Acre	$221.76	$237.60	$253.44	$269.28
Gross Premium - $/Acre	$59.45	$67.52	$76.36	$87.05
Farmer Paid Premium	$24.37	$30.38	$39.71	$53.97
Farmer Paid Rate	11.0%	12.8%	15.7%	20.0%
Subsidy	**$35.08**	**$37.14**	**$36.65**	**$33.08**

16 Year Premiums by State by Coverage Level



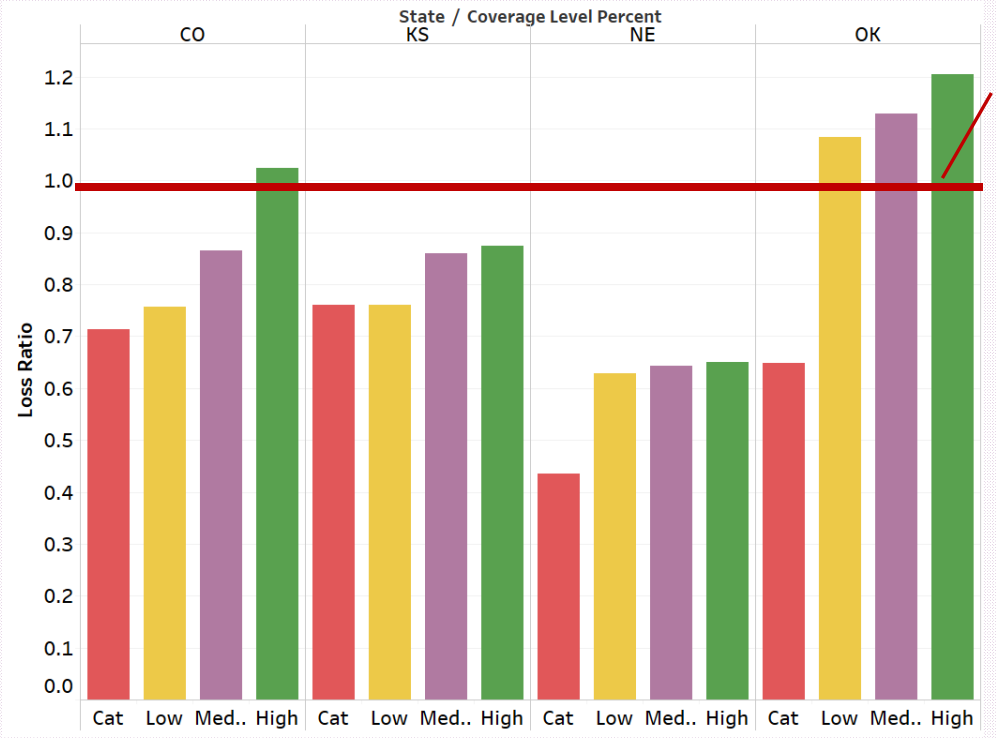
Cat.=50%

Low= 50-60%

Medium= 65-70%

High= 75-85%

16 Year Loss ratio by deductible by state



15-Year 1.0 Loss Ratio

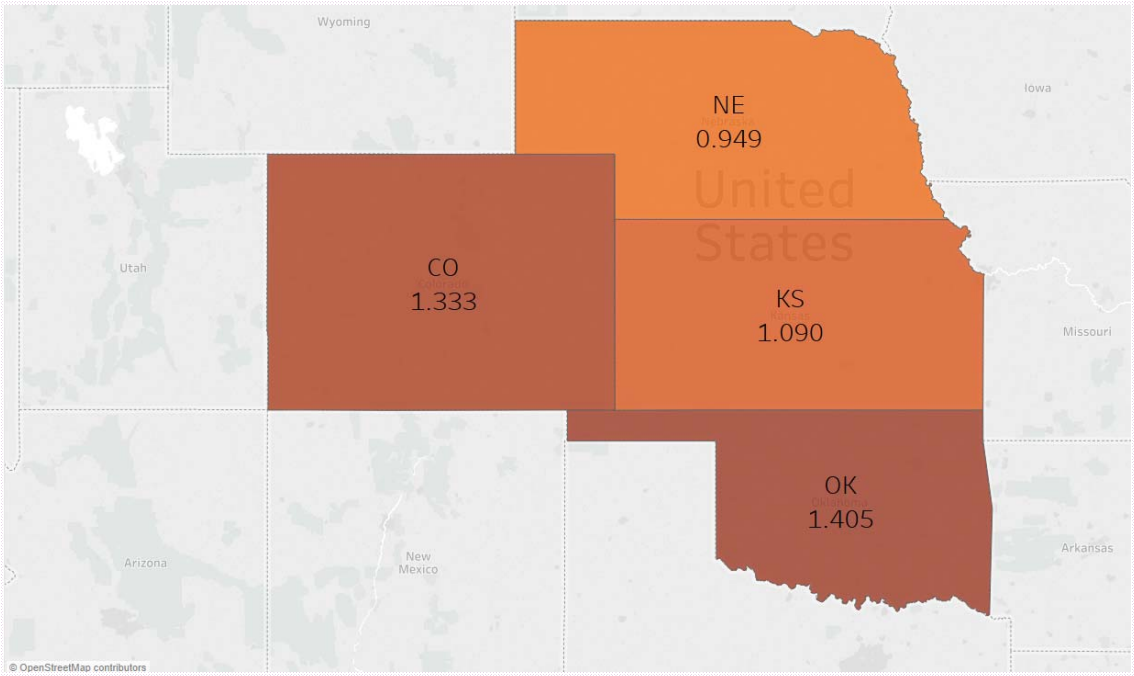
Cat.=50%

Low= 50-60%

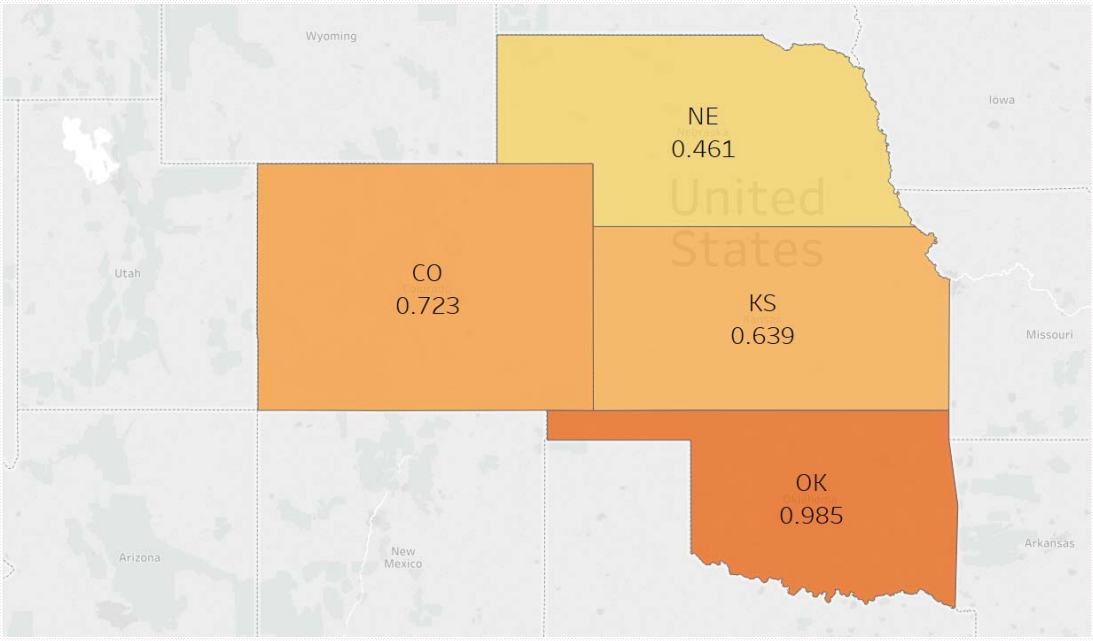
Medium= 65-70%

High= 75-85%

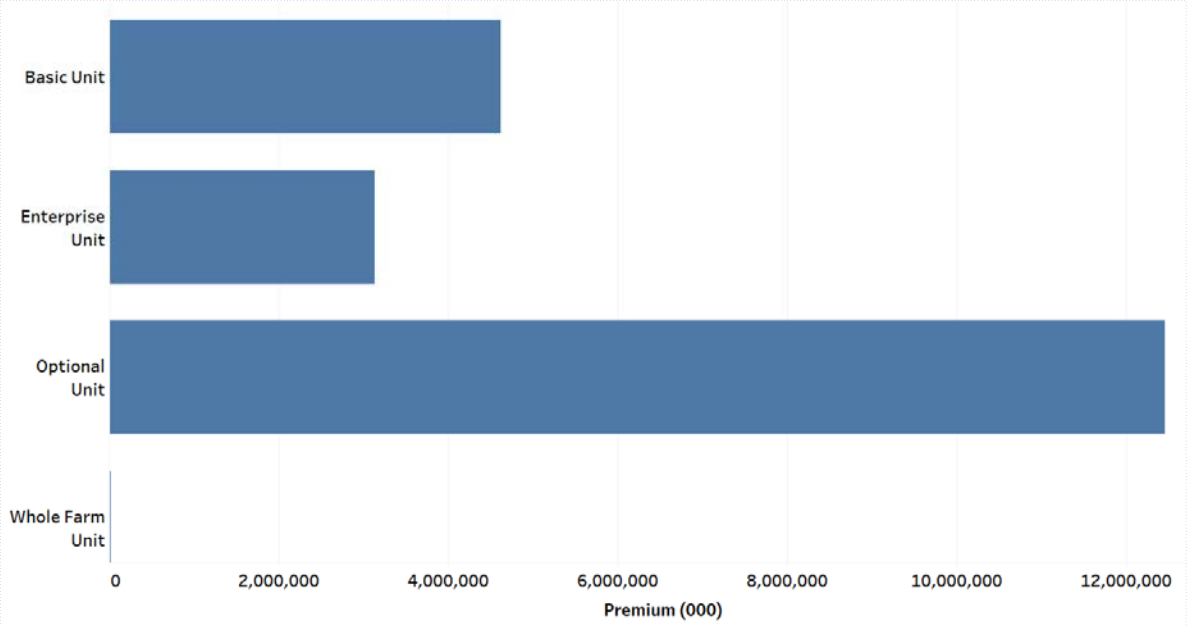
Does Irrigated Corn Subsidize Non-irrigated Corn?



Does Irrigated Corn Subsidize Non-irrigated Corn?



Premium by Unit Structure



Compare premiums for Enterprise Units vs. Optional Units

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%, Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80

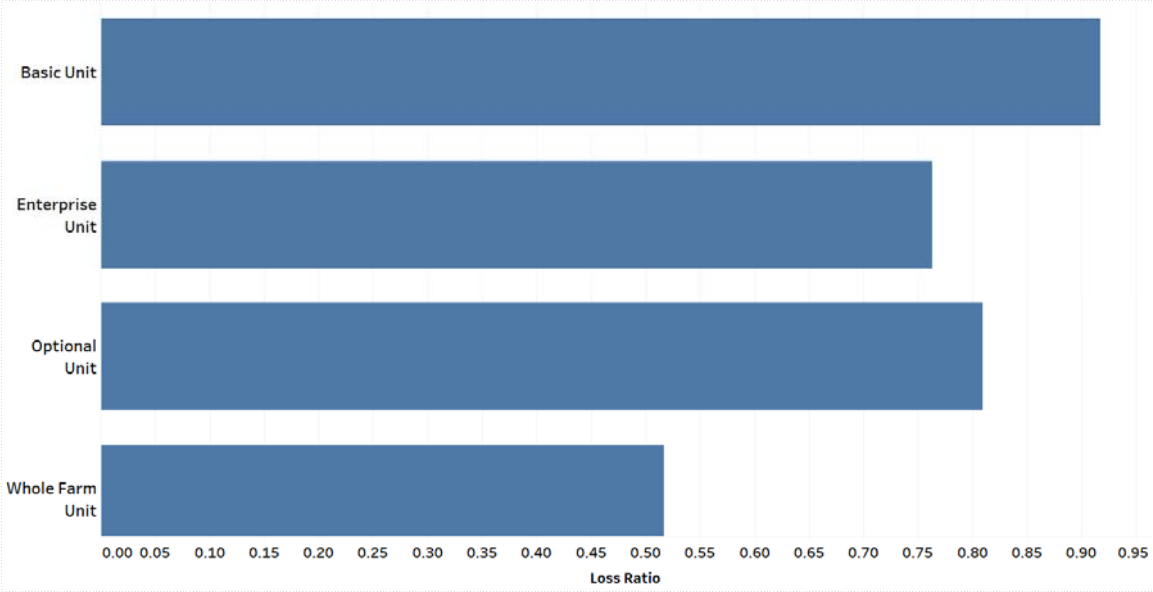
	70%	75%	80%	85%
Price Election	3.96	3.96	3.96	3.96
$ Coverage	$221.76	$237.60	$253.44	$269.28
Premiums:				
YP-OU Farm Paid	$21.76	$27.22	$35.61	$48.52
YP-EU Farm Paid	$7.12	$9.50	$15.21	$25.26
RP-hpe-OU Farm Paid	$21.95	$27.33	$35.71	$48.58
RP-hpe-EU Farm Paid	$7.33	$9.72	$15.45	$25.58
RP-OU Farm Paid	$24.37	$30.38	$39.71	$53.97
RP-EU Farm Paid	$8.33	$11.03	$17.55	$29.15

Change to EU and buy up a coverage level

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%, Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80

	65%	70%	75%	80%	85%
Price Election	3.96	3.96	3.96	3.96	3.96
OU Coverage	$205.92	$221.76	$237.60	$253.44	$269.28
	70%	75%	80%	85%	
EU Coverage	$221.76	$237.60	$253.44	$269.28	
Premiums:					
RP-OU Farm Paid	$21.25	$24.37	$30.38	$39.71	$53.97
RP-EU Farm Paid	$7.10	$11.03	$17.55	$29.15	

Loss Ratio by Unit Structure



Marginal Premium rate

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%,
Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80

	70%	75%	80%	85%
Price Election	$3.96	$3.96	$3.96	$3.96
Coverage - $/Acre	$221.76	$237.60	$253.44	$269.28
Gross Premium - $/Acre	$59.45	$67.52	$76.36	$87.05
Farmer Paid Premium	$24.37	$30.38	$39.71	$53.97
Farmer Paid Rate	11.0%	12.8%	15.7%	20.0%
Increase Coverage 5%				
Added $ Coverage	$15.84	$15.84	$15.84	$15.84
Added Farmer Paid Prem.	$3.12	$6.01	$9.33	$14.26
Marginal Rate	19.7%	37.9%	58.9%	90.0%

Calculate Premium Rate & Marginal Rate

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%, Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80; 85% Coverage Selected

Premium	/	85% Cov-erage	=	Rate
$49.02	/	$269.28	=	18.2%

Calculate Premium Rate & Marginal Rate

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%, Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80; 85% Coverage Selected

% Coverage	/	$ Coverage	=	Rate
85%		$269.28		
80%		$253.44		
Added Coverage		$15.84		
85%		$53.97		
80%		$39.71		
Added Premium		$14.26		

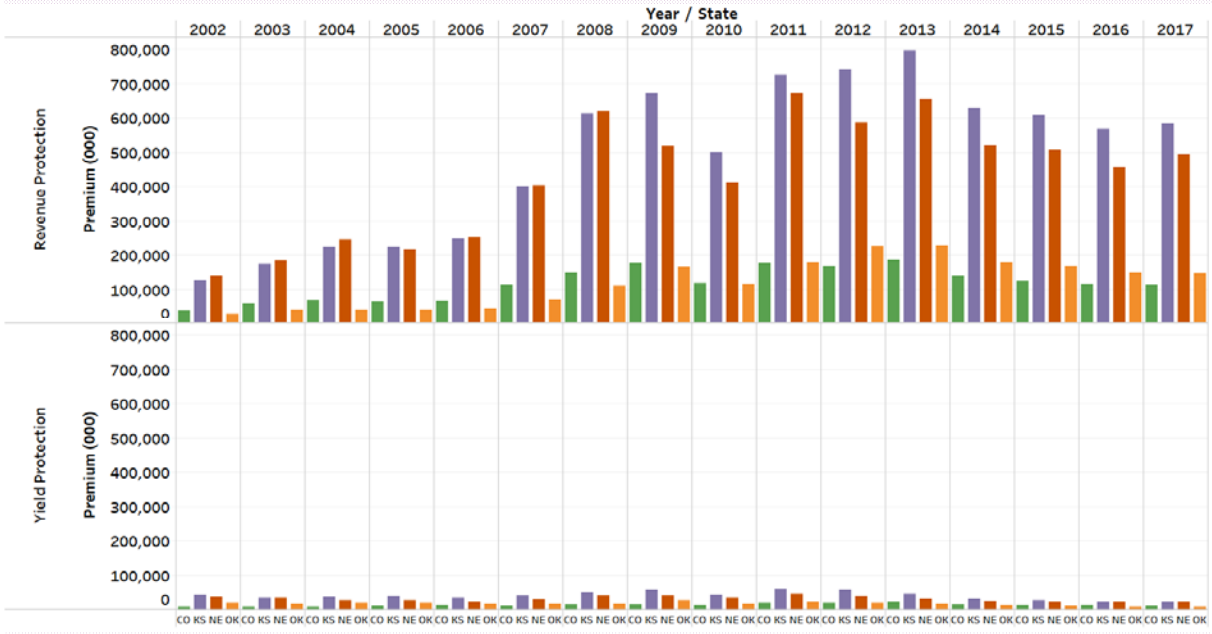
$ Added Premium	/	$ Added Coverage	=	Rate
$14.26	/	$15.84	=	90.0%

Margin farmer paid rate may exceed 100% in High Risk Counties

2018 Great Plains #2, CORN, RP, NON IRR, GSG, OU, $3.96/100%, Volatility: 0.14, Acres: 100, Yield: 64, Rate Yield: 64; High Risk

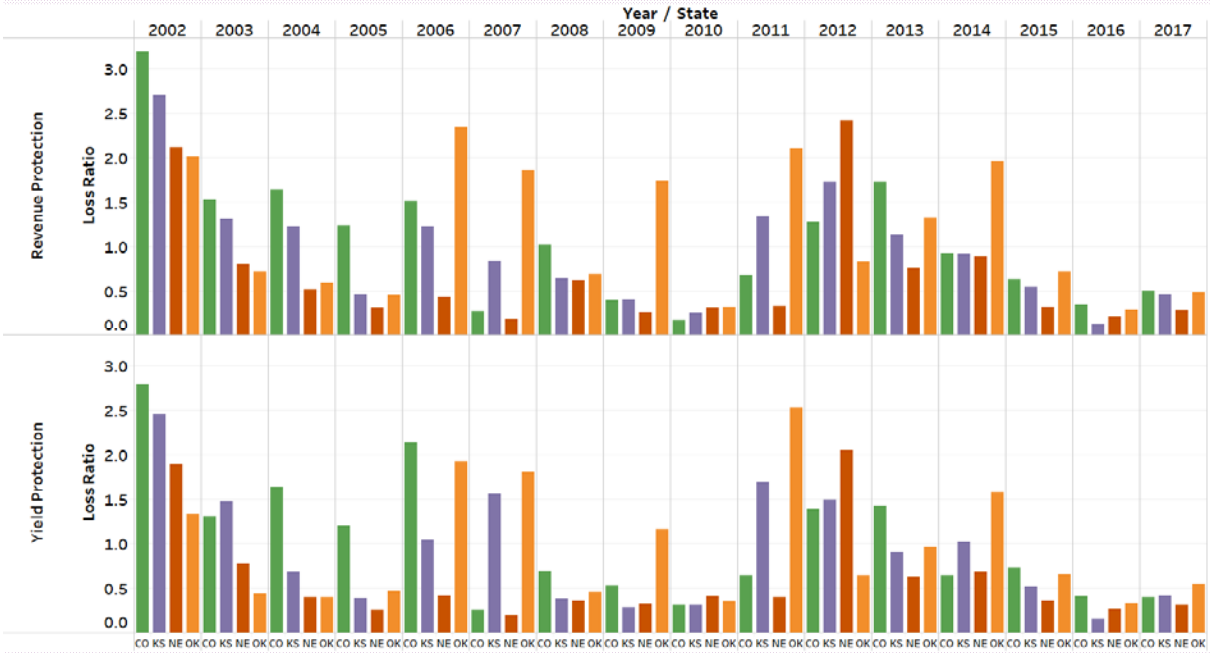
	70%	75%	80%	85%
Price Election	3.96	3.96	3.96	3.96
Coverage - $/Acre	177.41	190.08	202.75	215.42
Gross Premium - $/Acre	68.76	76.69	85.21	99.02
Net Premium - $/Acre	28.19	34.51	44.31	61.39
Farmer Paid Rate	15.9%	18.2%	21.9%	28.5%
Increase Coverage 5%				
Added $ Coverage	$12.67	$12.67	$12.67	$12.67
Added Farmer Paid Prem.	$3.61	$6.32	$9.80	$17.08
Marginal Rate	28.5%	49.9%	77.3%	134.8%

RP vs. YP Premiums



Green = Co, Purple = KS, Red = Nebraska, Orange = Oklahoma

RP vs. YP Loss Ratio



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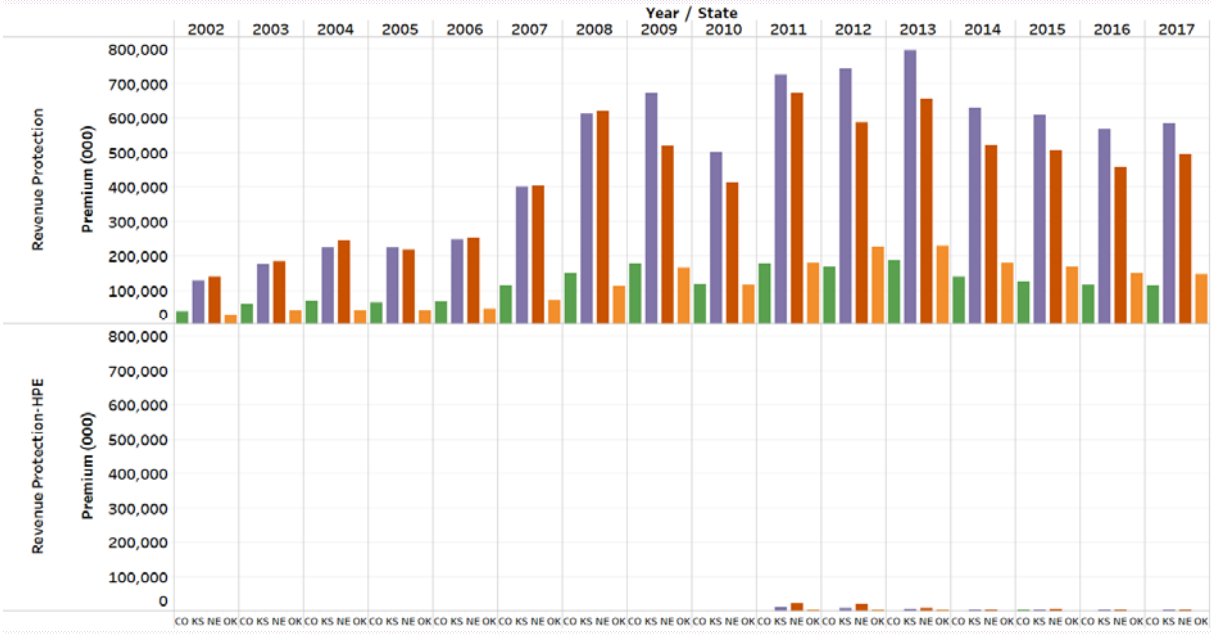
RP vs. RP-hpe Premiums



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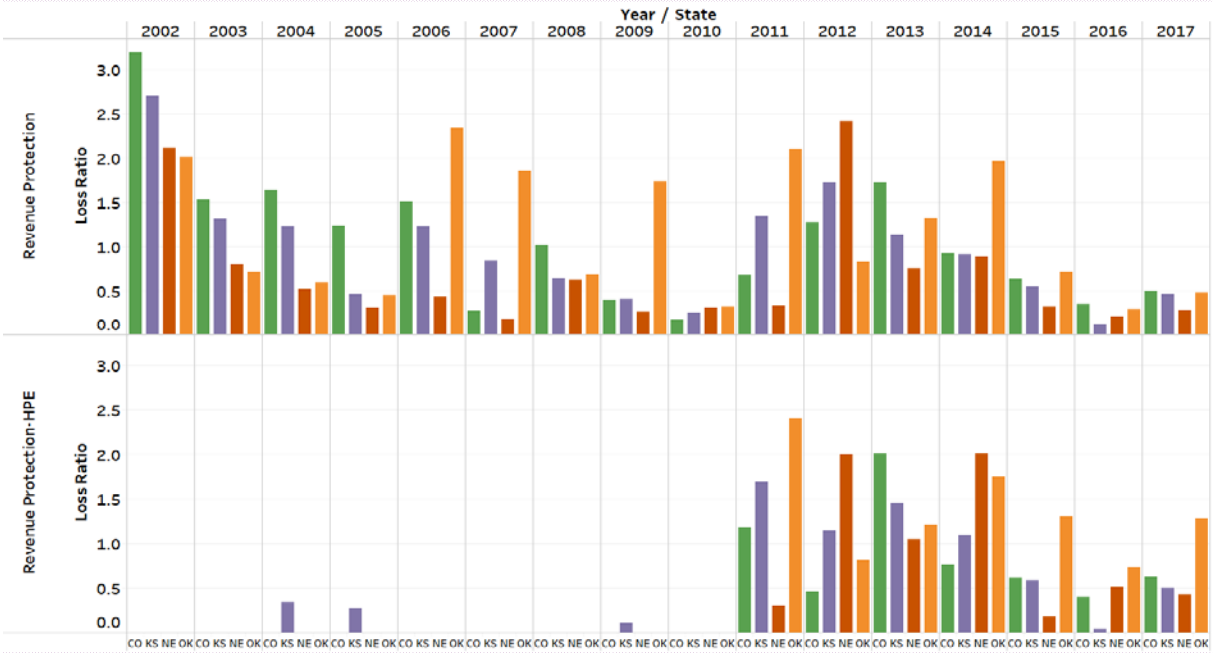
RP vs. RP-hpe Loss Ratio



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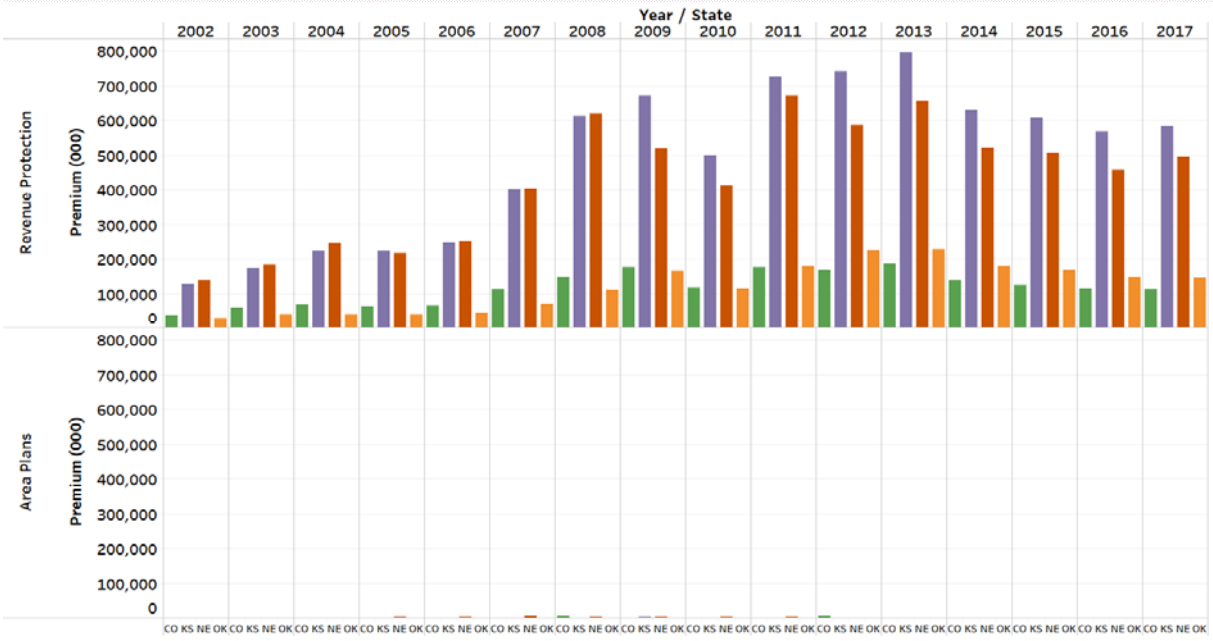
RP vs. Area Plans Premiums



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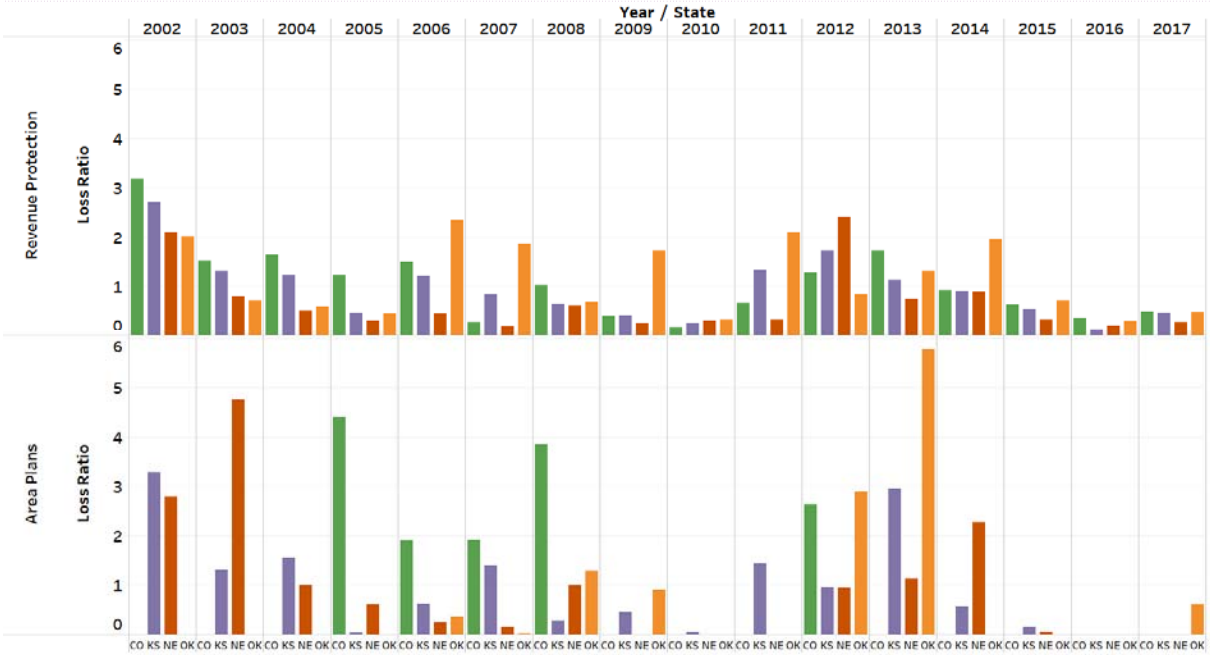
RP vs. Area Plans Loss Ratios



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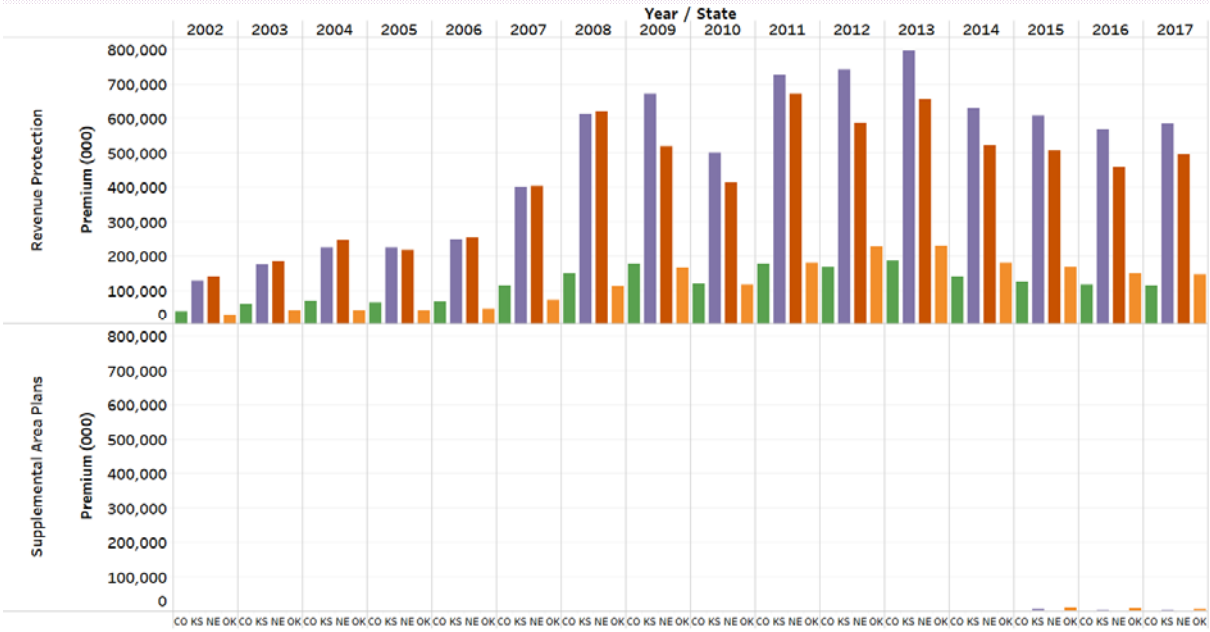
RP vs. SCO Premiums



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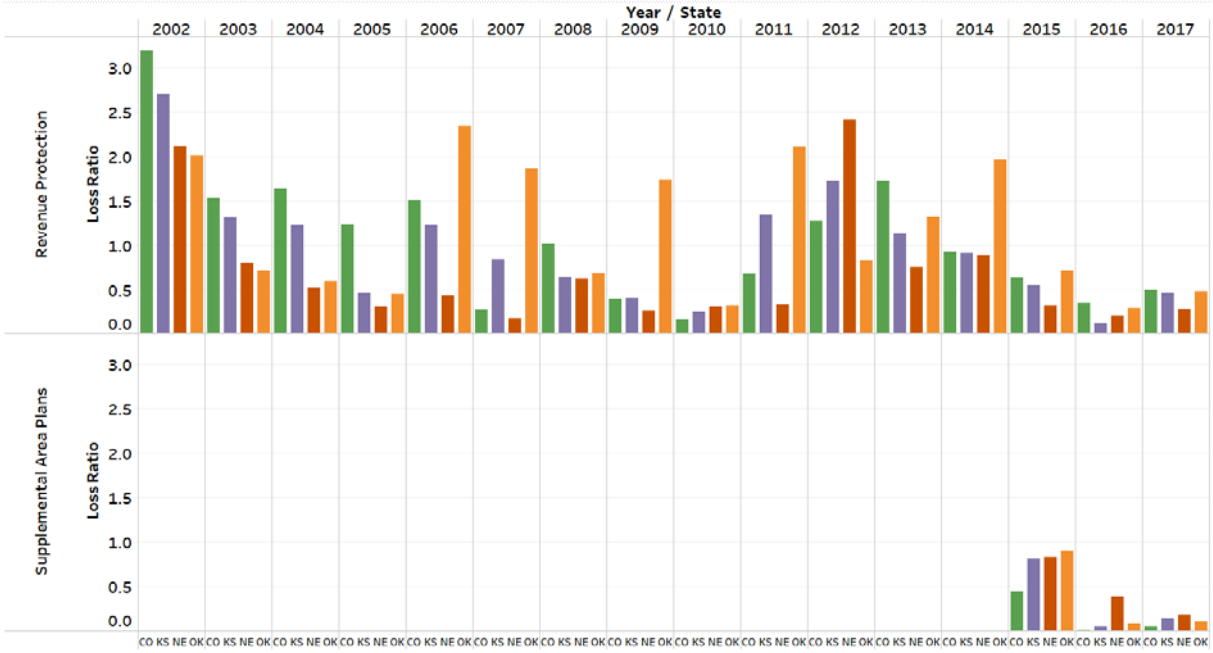
RP vs. SCO Loss Ratio



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Use TA or YE to increase APH From 80 to 85 bu.

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%,
Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80

	70%	75%	80%	85%
Price Election	$3.96	$3.96	$3.96	$3.96
Coverage - $/Acre	$221.76	$237.60	$253.44	$269.28
Farmer Paid Premium	$24.37	$30.38	$39.71 →	$53.97

TA or YE to increase APH From 80 to 85 bu

	65%	70%	75%	80%
Coverage - $/Acre	$218.79	$235.62	$252.45	$269.28
Farmer Paid Premium	$8.50	$10.61	$14.51 →	$20.73
Change in Coverage	($2.97)	($1.98)	($0.99)	$0.00
Change in Premium	($15.87)	($19.77)	($25.20)	($33.24)

Use TA or YE to increase APH From 80 to 91 bu.

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%,
Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80

	70%	75%	80%	85%
Price Election	$3.96	$3.96	$3.96	$3.96
Coverage - $/Acre	$221.76	$237.60	$253.44	$269.28
Farmer Paid Premium	$24.37	$30.38	$39.71 →	$53.97

TA or YE to increase APH From 80 to 91 bu

	60%	65%	70%	75%
Coverage - $/Acre	$216.22	$234.23	$252.25	$270.27
Farmer Paid Premium	$6.31	$9.09	$11.36 →	$15.54
Change in Coverage	($5.54)	($3.37)	($1.19)	$0.99
Change in Premium	($18.06)	($21.29)	($28.35)	($38.43)

Time to Give WFRP a Second Look?

1. An old academic study on whole farm coverage published in the Journal of Agricultural and Applied Economics showed only limited benefits from whole farm coverage.
2. WFRP contract is being used by Pacific Northwest wheat-barley growers as an umbrella policy, versus stand alone coverage. Covers quality losses & unexpended weak basis.
3. Used to cover quality loss on high quality alfalfa produced for international shipping.
4. Provides cow-calf coverage and can be combined with Pasture-forage coverage on hay and pasture consumed on the farm. Liability limit $million, $8.5 million on crops.
5. Does not work for farmers who hedge, but they can use hta's or forward contracts.

Time to Give WFRP a Second Look?

5. Using WFRP as a supplemental will cause "low" premium costs, because a large part of the risk is covered by YP/RP.

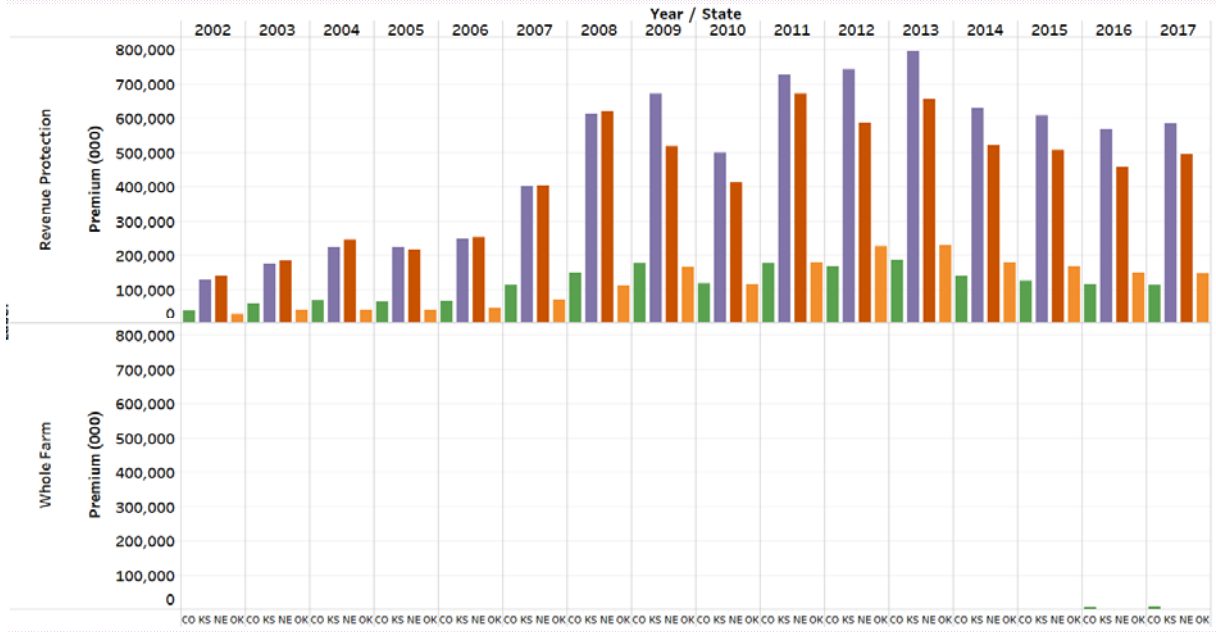
6. 80% of the premium is paid by RMA for 75% WFRP coverage, the same as enterprise units.

7. Coverage is tied to the Schedule F, or a constructed Schedule F.

8. WFRP is a major departure from the common crop insurance contracts, and is complicated for people with limited tax experience. Most farmers hire an expert to complete their tax returns.

9. Given recent non-indemnified quality losses and extreme basis, it is time to give WFRP a second look, but will require education.

RP vs. Whole Farm Premiums



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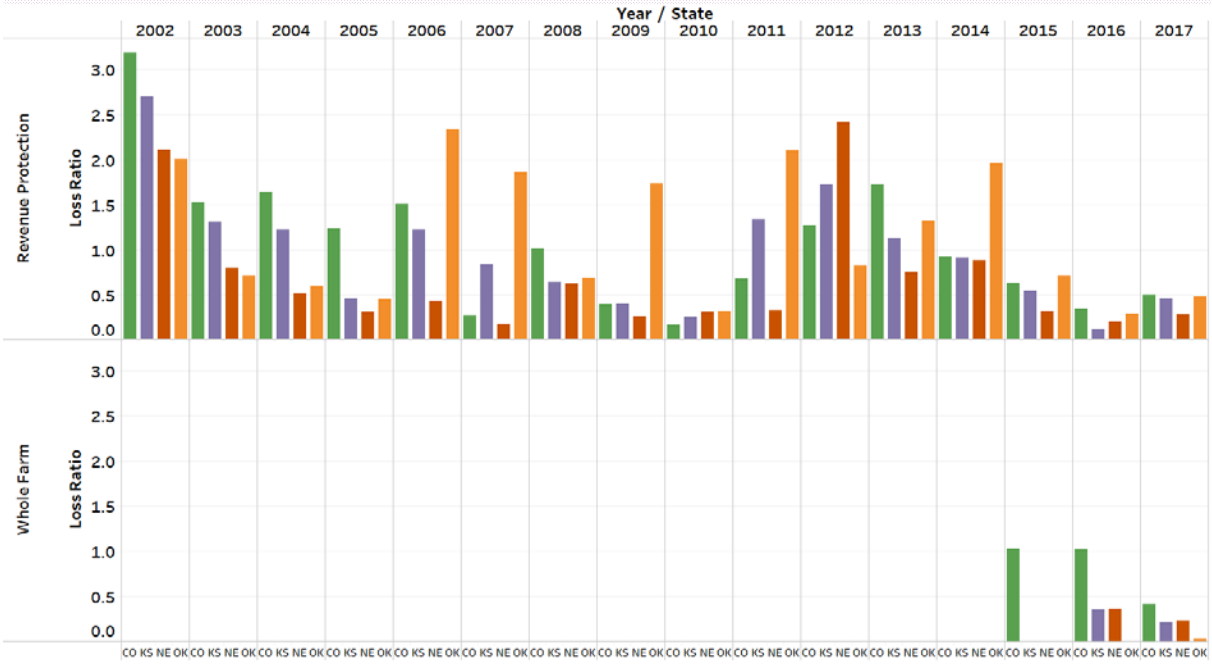
RP vs. Whole Farm Loss Ratio



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Split the RP indemnity for losses caused by yield vs. losses caused by price

1 Sales = Production X (harvest price + basis)

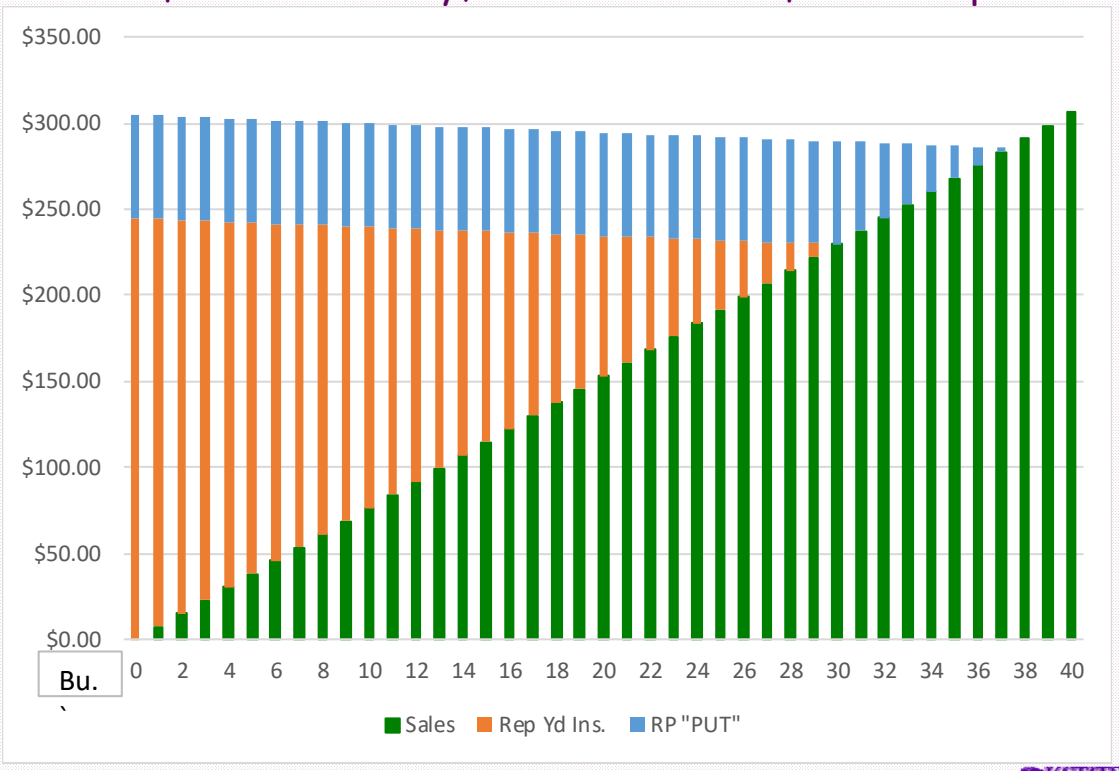
2 Yield replacement insurance =
max [(% coverage X APH) – production,0] X harvest price

3 "Put" Payment before Yield Adjustment
(Max (RP strike price - harvest price, 0) X guaranteed bushels) - Yield Adjustment

4 Asian "Put" adjusted for yield =
Max (production – bushels guaranteed, 0) X harvest price

5 Total Revenue =
Sum (sales, yield loss, price loss adjusted for higher yields)- Premium

Split RP Soybean indemnity by Yield Loss vs. Price Loss with "Put" $2 in the Money, APH = 40 bu. & $10.16 RP price



Split RP Soybean indemnity by Yield Loss vs. Price Loss with "Put" $2 out of the Money, APH = 40 bu. & $10.16 RP Price

Effective "put" strike in RP

2018 Great Plains, CORN, RP, NON IRR, GSG, OU, $3.96/100%,
Volatility: 0.15, Acres: 100, Yield: 80, Rate Yield: 80

	70%	75%	80%	85%
Price Election	$3.96	$3.96	$3.96	$3.96
Coverage - $/Acre	$221.76	$237.60	$253.44	$269.28
Effective Put Strike	**$2.77**	**$2.97**	**$3.17**	**$3.37**
"Put" Premium Per bu.	$0.004	$0.004	$0.004	$0.005
% Price Decline	(30.0%)	(25.0%)	(20.0%)	(15.0%)

75% X $3.96 = $2.97

Crop Insurance Price Change, Past 16 Years

	Mar 15 Corn							Mar 15 Soybeans				Jan Soybean futures			
Year	RP Plant Price[2]	RP Harv. Price[3]	Vola-tility[4]	% Price Chan-ge[5]	Sep Avg	Vola-tility[4]	% Sep Price Chan-ge[5]	RP Plant Price[2]	RP Harv. Price[3]	Vola-tility[4]	% Price Chan-ge[5]	Feb Avg	Nov Avg	Vola-tility	% Nov Price Chan-ge[5]
2018	3.96		0.15		3.58	0.14	(9.6%)	10.16	8.64	0.14	(15.0%)	10.21		0.13	
2017	3.96	3.49	0.19	(11.9%)	3.54	0.18	(10.6%)	10.19	9.75	0.16	(4.3%)	10.23	9.88	0.15	(3.4%)
2016	3.86	3.49	0.17	(9.6%)	3.34	0.16	(13.5%)	8.85	9.75	0.12	10.2%	8.90	10.07	0.13	13.1%
2015	4.15	3.83	0.21	(7.7%)	3.79	0.19	(8.7%)	9.73	8.91	0.16	(8.4%)	9.78	8.66	0.16	(11.5%)
2014	4.62	3.49	0.19	(24.5%)	3.39	0.17	(26.6%)	11.36	9.65	0.13	(15.1%)	11.41	10.32	0.13	(9.6%)
2013	5.65	4.39	0.20	(22.3%)	4.60	0.19	(18.6%)	12.87	12.87	0.17	0.0%	12.91	12.93	0.18	0.2%
2012	5.68	7.50	0.22	32.0%	7.63	0.21	34.3%	12.55	15.39	0.18	22.6%	12.60	14.48	0.18	14.9%
2011	6.01	6.32	0.29	5.2%	6.94	0.27	15.5%	13.49	12.14	0.23	(10.0%)	13.52	11.71	0.24	(13.4%)
2010	3.99	5.46	0.28	36.8%	4.89		22.6%	9.23	11.63	0.20	26.0%				
2009	4.04	3.72	0.37	(7.9%)	3.25		(19.5%)	8.80	9.66	0.31	9.8%				
2008	5.40	4.13	0.30	(23.5%)	5.46		1.2%	13.36	9.22	0.31	(31.0%)				
2007	4.06	3.58	0.26	(11.8%)	3.59		(11.7%)	8.09	9.75	0.19	20.5%				
2006	2.59	3.03	0.23	17.0%	2.49		(4.0%)	6.18	5.93	0.21	(4.0%)				
2005	2.32	2.02	0.21	(12.9%)	2.10		(9.5%)	5.53	5.75	0.21	4.0%				
2004	2.83	2.05	0.21	(27.6%)	2.18		(23.0%)	6.72	5.26	0.21	(21.7%)				
2003	2.42	2.26	0.20	(6.6%)	2.31		(4.4%)	5.26	7.32	0.18	39.2%				
2002	2.32	2.52	0.18	8.6%	2.72		17.3%	4.50	5.45	0.16	21.1%				

Crop Insurance Price Change, Past 17-32 Years

	Mar 15 Corn						% Sep	Mar 15 Soybeans			
	RP Plant	RP Harv.	Vola-	% Price Chan-	Sep	Vola-	Price Chan-	RP Plant	RP Harv.	Vola-	% Price Chan-
Year	Price[2]	Price[3]	tility[4]	ge[5]	Avg	tility[4]	ge[5]	Price[2]	Price[3]	tility[4]	ge[5]
2001	2.46	2.08	0.20	(15.3%)	2.22		(9.9%)	4.67	4.37	0.16	(6.4%)
2000	2.51	2.04	0.21	(18.7%)	1.93		(23.1%)	5.32	4.72	0.20	(11.2%)
1999[6]	2.40	2.01	0.14	(16.1%)	2.15		(10.5%)	5.11	4.85	0.17	(5.1%)
1998	2.84	2.19	0.20	(23.0%)	2.08		(26.6%)	6.64	5.46	0.18	(17.7%)
1997	2.73	2.81	0.18	3.1%	2.64		(3.2%)	6.97	6.82	0.17	(2.1%)
1996	3.08	2.84	0.19	(7.9%)	3.20		3.8%	7.23	7.07	0.16	(2.2%)
1995	2.57	3.23	0.15	25.7%	3.03		17.9%	5.85	6.56	0.15	12.2%
1994	2.68	2.16	0.16	(19.5%)	2.20		(17.8%)	6.48	5.41	0.14	(16.5%)
1993	2.40	2.49	0.15	3.7%	2.40		0.2%	5.86	6.15	0.15	4.9%
1992	2.70	2.09		(22.7%)	2.18		(19.3%)	6.06	5.37		(11.4%)
1991	2.59	2.51		(3.1%)	2.52		(2.9%)	6.15	5.60		(8.9%)
1990	2.47	2.30		(7.1%)				5.95	6.12		2.8%
1989	2.71	2.39		(11.7%)				7.24	5.62		(22.4%)
1988	2.17	2.89		33.3%				6.43	7.93		23.3%
1987	1.69	1.83		8.3%				4.71	5.38		14.2%

Wheat Crop Insurance Price Change, Past 1-32 Years

	Sep 30 KC Wheat			
	RP Plant	RP Harv.	Vola-	% Price Chan-
Year	Price[2]	Price[3]	tility[4]	ge[5]
2018	4.87	5.07	0.16	4.1%
2017	4.59	4.59	0.18	0.0%
2016	5.20	4.5	0.22	(13.5%)
2015	6.30	5.31	0.17	(15.7%)
2014	7.02	7.17	0.19	2.1%
2013	8.78	7.22	0.24	(17.8%)
2012	8.62	6.75	0.26	(21.7%)
2011	7.14	8.18	0.33	14.6%
2010	5.42	4.79	0.33	(11.6%)
2009	8.77	6.35	0.27	(27.6%)
2008	5.88	7.88	0.33	34.0%
2007	4.52	5.62	0.30	24.3%
2006	3.52	4.81	0.20	36.6%
2005	3.56	3.28	0.18	(7.9%)
2004	3.40	3.77	0.19	10.9%
2003	3.73	3.14	0.19	(15.8%)
2002	3.34	3.09	0.22	(7.5%)

	Sep 30 KC Wheat			
	RP Plant	RP Harv.	Vola-	% Price Chan-
Year	Price[2]	Price[3]	tility[4]	ge[5]
2001	3.31	3.07	0.18	(7.3%)
2000	3.34	3.02	0.20	(9.6%)
1999[6]	3.16	2.84	0.21	(10.1%)
1998	3.95	3.04		(23.1%)
1997	4.13	3.64		(11.7%)
1996	3.91	5.76		47.4%
1995	3.52	4.24		20.4%
1994	3.00	3.37		12.0%
1993	3.20	2.87		(10.3%)
1992	3.05	3.59		17.9%
1991	3.07	2.86		(6.9%)
1990	3.69	3.29		(10.9%)
1989	3.65	4.14		13.5%
1988	2.78	3.79		36.4%
1987	2.39	2.64		10.5%

10% or More Corn Price Change, Past 25 Years, Crop Insurance sales closing March 15

OBS	Year	RP Plant Price	RP Harv. Price	RMA Vola-tility	% Price Change	RP Plant Price	RP Harv. Price	RMA Vola-tility	% Price Change
1	2017	3.96	3.49	0.19	(11.9%)	5.68	7.50	0.22	32.0%
2	2014	4.62	3.49	0.19	(24.5%)	3.99	5.46	0.28	36.8%
3	2013	5.65	4.39	0.20	(22.3%)	2.59	3.03	0.23	17.0%
4	2008	5.40	4.13	0.30	(23.5%)	2.57	3.23	0.15	25.7%
5	2007	4.06	3.58	0.26	(11.8%)				
6	2005	2.32	2.02	0.21	(12.9%)				
7	2004	2.83	2.05	0.21	(27.6%)				
8	2001	2.46	2.08	0.20	(15.3%)				
9	2000	2.51	2.04	0.21	(18.7%)				
10	1996	2.40	2.01	0.14	(16.1%)				
11	1998	2.84	2.19	0.20	(23.0%)				
12	1994	2.68	2.16	0.16	(19.5%)				

RP Yield Adjusted Asian Options vs. CME traded Options

1. RP strike price is based on a monthly average price. CME trade multiple strike prices.
2. RP premiums are based on the last 5 trading days prior to the 15 days before RP sales closing. CME option premiums are continuously traded.
3. RP options have no exercise rights. CME options can be exercised.
4. RP options have intrinsic value only, no time value. CME options will have intrinsic plus time value based on the days to expiration and volatility.

RP Yield Adjusted Asian Options vs. CME traded Options

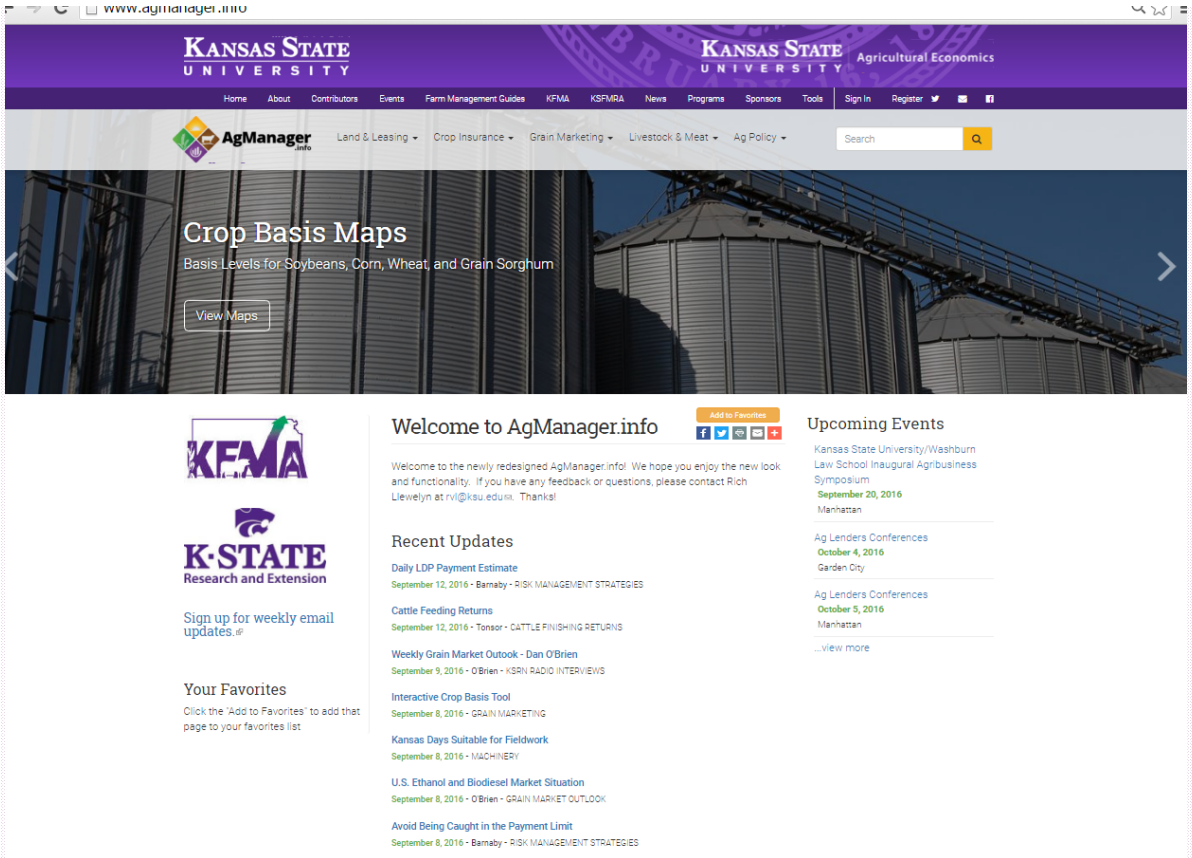
5. RP options are settled on the harvest monthly average price and pay intrinsic value only. CME options are spot settled.
6. RP "put" can take on negative values.
7. RP settlement values are adjusted for yield. CME options are settled based on price only.

Why has Crop Insurance Changed from an Unpopular Policy to the Farmer Preferred Policy?

1. In 1980, no farmer interest in protecting crop insurance. A long history of "free" disaster aid.
2. Premium volume has increased from $156 million to over $10 billion.
3. In 1980 moved crop insurance to private sales via local licensed insurance agents and private insurance companies reinsured by RMA.
4. Changed from assigned yield to an individual farmer 10 year proven yield.
5. Introduced replacement yield coverage (MVP)

Why has Crop Insurance Changed from an Unpopular Policy to the Farmer Preferred Policy?

6. Introduced CAT coverage.
7. Introduced Area Plans (Group Risk)
8. Introduced Revenue Insurance (CRC, RA, RP)
9. Introduced Whole Farm Coverage
10. Introduced Pasture & Forage Coverage
11. No limit on farm size, but must be in conservation compliance



High volatility increases RP premiums

2018 Great Plains, CORN, RP, NON IRR, GSG, EU, $3.84/100%,
Volatility: 0.30, Acres: 100, Yield: 80, Rate Yield: 80

1 % Coverage	65%	70%	75%	80%	85%
2 Coverage - $/Acre	$199.68	$215.04	$230.40	$245.76	$261.12
3 RP EU Net Premium	$5.29	$6.29	$8.56	$14.49	$25.07
4 RP EU Net Premium 30% Volatility	$6.28	$7.47	$10.16	$17.08	$29.36
5 Premium Change	$0.99	$1.18	$1.60	$2.59	$4.29