Crop Insurance and Corn: Helpful Hints to Make More Money and GRP in Juneau, Adams, and **Marquette Counties** Paul D. Mitchell **Agricultural and Applied Economics** Office: (608) 265-6514 Email: pdmitchell@wisc.edu Extension Web: www.aae.wisc.edu/mitchell/extension.htm UWEX Corn Field Day: August 2006, Juneau County

Goal Today

Brief overview of APH and GRP crop insurance policies and how they work General and specific hints on how to use them to make more money Focus on corn (not soybeans) and yield risk (not price/marketing) Brief description (no analysis) of AGR-Lite for organic grain producers

Actual Production History (APH)

If harvested yield is less than yield guarantee, farmer receives an indemnity Yield guarantee based on actual yield history (APH) Other names Multiple Peril Crop Insurance (MPCI) Catastrophic Coverage (CAT) is the minimum APH coverage available

How APH Works

Unit Structure (Basic, Optional, Enterprise)
Coverage Level (50% to 85%)
Price Election (55% to 100%)
Premiums

Insurance Unit

Yield from a "unit" is what is insured If yield for the whole unit is less than the unit's yield guarantee, triggers indemnity • A 300 acre unit with a 100 bu/ac guarantee would have to yield less than $100 \times 300 =$ 30,000 bu to trigger an indemnity Each unit is possibly/likely several fields Farm must choose one of three unit types Basic Unit, Optional Unit, Enterprise Unit

Basic Unit

One basic unit for all acres farmer <u>owns/cash rents</u> in a county Additional basic unit for all acres the farmer share rents with a different landlord in a county If insure all acreage as basic units, you receive a 10% premium discount

Optional Unit

One optional unit for all acres in different township sections that a farmer owns or cash rents

Can separate optional units <u>if different</u> practices or crop types

Dryland and Irrigated Corn
 Corn for Grain and Corn for Silage

Enterprise Unit

Combine all acreage for a crop in a county into a single unit
 Farmer using an enterprise unit pays lower premiums

Farms A-G: Same operator planting the same crop in the same county

Farm A Owned Township Section 1	Farm B 50-50 crop share lease from Smith Farm C cash rent lease from Smith	Farm D cash rent lease from Jones Farm E 50-50 crop share lease from Smith	Township Section 2	Ва 1 2 3 Ор 1 2
<u>Farm F</u> Owned		Farm G 60-40 crop share lease from Black		2 3 4
Township Section 12		Township Section 11		5 6 En 1

sic Units A+C+D+F B + EG tional Units A + CB D Е F G terprise Unit All units A to G

Adapted from W. Edwards, "Insurance Units for Crop Insurance." Iowa State University Extension A1-56, February 2003. www.extension.iastate.edu/agdm/crops/pdf/a1-56.pdf

Best Unit Structure

300 acre unit with 100 bu/ac guarantee must yield less than 100 x 300 = 30,000 bu to trigger an indemnity

Suppose three 100 ac fields: one with 0 bu/ac & two with 150 bu/ac = 30,000 bu, so triggers no indemnity

Farmers make more money with <u>Optional</u> <u>Units</u> than with Basic Units and Enterprise Units, even though pay higher premiums

Coverage Level

Pick percent of APH yield to guarantee: 50% 55% 60% 65% 70% 75% 80% 85% Unit yield below this yield guarantee triggers an indemnity ■ 100% – Coverage Level ~= Deductible Higher coverage level has higher premium 65%-75% generally are best deal 50% (CAT) is essentially free

Price Election

Crop price used to pay indemnities RMA announces price elections at sign-up, based on CBOT futures prices Available options: 55% to 100% by 1% increments of announced price election Best to take max price election and adjust coverage level

Premium Subsidies Producer premiums subsidized by RMA, so should be better than fair

Coverage Level (%)5055606570758085Premium Subsidy (%)6764645959554838Producer Share (%)3336364141455262

Producers should <u>on average</u> make money with APH crop insurance, if the RMA has correct premiums

APH Premiums (\$/ac) 100% Price Election, Optional Units

150 APH Dryland 200 APH Irrigated Adams Marquette Marquette Juneau Adams Juneau 5.35 5.99 55% APH 5.18 3.74 4.76 3.62 8.95 8.09 6.10 7.70 7.12 5.77 65% APH 75% APH 12.86 11.20 9.61 13.23 14.08 10.80

APH Hints to Make More Money If APH valuable (which is not certain) Use as many Optional Units as possible 0 Take the maximum 100% price election 0 65%-75% coverage levels generally best deal 0 (Avoid 80% and 85% coverage: too expensive) Premium subsidies imply that on average 0 should make money with APH crop insurance, if RMA has correct premiums Coverage available even if no yield history

• Consider at least CAT, since essentially free

Is APH worth it in JAM? Monte Carlo simulations to estimate net indemnity (average return – premium) Corn price: \$2.00/bu Assume good producer 150 bu/ac for dryland corn 200 bu/ac for irrigated corn Yield Coefficient of Variation (CV) 35% for dryland, 30% for irrigated



	unit 1	unit 2
avg	67.5	63
stdev	43.6	34.6
CV	65%	55%

unit 1

unit 2



unit 3unit 4avg91.2126stdev17.920.8cv20%16%

2006 Net Indemnity (\$/ac) for corn APH Dryland: APH yield 150 bu/ac, 35% CV Irrigated: APH yield 200 bu/ac, 30% CV Juneau Adams Marquette dryland irigated irigated dryland dryland irigated -0.99 0.741.76 0.32-1.630.742.27-0.230.632.85 4.202.62 3.65 2.62 5.31 1.776.90 5.05

2006 Net Indemnity (\$/ac) for Corn APH Sensitivity Analysis Dryland Corn							
Decrea	se APH to	County T	Increase	CV from 3	5% to 45%		
	$- CV = 35^{\circ}$	%		- CV = 45	%		
APH 108	APH 126	APH 105	AF	PH Yield =	150		
<u>Adams</u>	<u>Juneau</u>	<u>Marquette</u>	<u>Adams</u>	<u>Juneau</u>	<u>Marquette</u>		
-0.62	-0.31	0.35	6.33	6.75	7.77		
0.31	1.01	2.92	10.47	11.05	12.40		
0.52	2.28	2.55	13.82	15.48	17.07		

APH Hints to Make More Money

APH can be valuable for JAM corn farmers
Need high yield variability (CV ≥ 35%)
Most irrigated farmers will not find APH valuable
Some dryland farmers will find APH valuable Calculate CV for your yield history
Use 65%-75% coverage level
Use 100% price election

Can GRP work as an alternative to APH for low risk JAM farmers???

Group Risk Protection (GRP)

If USDA-NASS county average yield is less than county yield guarantee, farmer receives indemnity based on acres planted Like APH, but for county yield Coverage Level: 65% 70% 75% 80% 85% 90% of county average yield for yield trigger Price Election: choose 100% to 60% in 1% increments, or 45% as CAT Choose to insure county average yield per harvested acre or per planted acre

Group Risk Protection (GRP)

Basically you bet vs the RMA on level of county yield, but government subsidizes the premium, so you should make money Works better than APH if your yields closely follow county yield or you have low risk yields use hail/fire policy for localized losses Analyzed APH and GRP in JAM to see how they compare

GRP Hints to Make More Money

If RMA has GRP premiums right and GRP is valuable (which is not certain)

- GRP better than APH if have low risk yields and your yields closely follow county yield (ρ > 0.6)
 Combine GRP with Hail/Fire policy for coverage vs localized individual losses
- Best GRP deal

Maximum coverage level (90%)
Maximum price election (100%)
Yield per Harvested acre

Analysis of GRP in J-A-M

Goal: To see if GRP valuable in J-A-M
Graphical analysis
Numerical analysis

Use observed yield data
Use simulated yields

Graphical Analysis of GRP

 Plot USDA-NASS county yield data and GRP yield guarantees
 See how likely to trigger GRP indemnity
 USDA-NASS data (<u>www.nass.usda.gov</u>)
 Years 1973-2005 (33 years)







2006 GRP premiums (\$/ac) for yield per harvested acre and per planted acre

Premium 70% Adams Juneau Marquette Premium 90% Adams Juneau Marquette

Harvested 0.79 0.96 0.80 Harvested 4.34 5.01 4.18

Planted 1.44 1.43 1.11 Planted 6.01 6.56 5.36

Average net indemnity (\$/ac) for 2006 GRP using last 10 years of county yields

70% Coverage Harvested Planted -0.79Adams -1.44-0.96 -1.43Juneau Marquette -1.11-0.80 90% Coverage Harvested Planted -2.23Adams 5.26 26.86 2.64Juneau Marquette 4.22 0.68

Simulation Analysis

Estimate county mean yield and standard deviation assuming linear trend Use Monte Carlo simulation to draw 10,000 yields and calculate expected GRP net indemnity (average return – premium) Smoothes empirical analysis and do not assume next year will be average of the last 10 years Does RMA have 2006 expected yield right?

RMA and Regression estimates of GRP expected county yield for 2006

Yld/hrvstd acre Adams Juneau Marquette Yld/plntd acre Adams Juneau Marquette

RMA 107.6 125.8 104.7 **RMA** 95.1 106.1 85.7

Regression 119.2 133.8 114.3 Regression 105.6 115.9 93.8











What's the expected county yield for 2006?

If the RMA is right, then corn yields in JAM have leveled off (stopped growing at trend). If so, why? If the regression is right, yields in JAM have been off trend for awhile and county yields should increase The estimated net indemnity for GRP depends crucially on which is right

Net Indemnity for GRP with simulated yields using RMA and regression estimated expected county yield Harvested Harvested Planted Planted 70% Covrq <u>RMA</u> <u>RMA</u> **Regression** Regression -0.65 -0.28-0.59 -1.22 Adams -0.73 -1.09-0.34-0.40Juneau -0.63 -0.25 0.23 -0.67 Marquette Harvested Harvested Planted Planted 90% Covrq **RMA** Regression <u>RMA</u> Regression -3.79 -2.752.122.75 Adams -3.143.05 -1.573.04 Juneau 3.81 -1.77-2.013.06 Marquette

GRP Hints to Make More Money GRP has value in JAM if RMA has expected vields right About \$3/ac over cost of premium (\$4-\$5/ac) Use 90% coverage level 100% and price election and yield per Harvested Acre If long term yield trend is right, then GRP does not have value in JAM Basically, you are betting on county yield