FARM BUSINESS MANAGEMENT

FARM ECONOMICS Facts & Opinions

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GROUP CROP INSURANCE PLANS

A new group crop insurance product was introduced in 2004, bringing the total number of group products to three. These three are:

Group Risk Plan (GRP) – GRP is a yield insurance that makes payments when county yield falls below a county trigger yield.

Group Risk Income Plan without a harvest revenue option (GRIP-NoHR) – GRIP-NoHR is a revenue insurance that makes payments when county revenue falls below county trigger revenue. The trigger revenue is known during the spring and, unlike GRIP-HR, will not change during a year. This insurance has been available in Illinois since 1999.

Group Risk Income Plan with a harvest revenue option (GRIP-HR) – GRIP-HR is a revenue insurance that makes payments when county revenue falls below county trigger revenue. Unlike GRIP-NoHR, the trigger revenue can increase if prices are higher during the fall than in the spring. This product was released for use in 2004.

Unlike crop insurance products that insure individual farm yields or revenues, such as Actual Production History (APH), Crop Revenue Coverage (CRC), Income Protection (IP), and Revenue Assurance (RA), the group plans make payments based on county yields or county revenues. This document describes these group products. General guidance on their use also is provided.

Description of Group Products

An example for corn in McLean County, Illinois representing 2005 is used to describe and illustrate the group products (see Figure 1).

The **expected county yield** is set by the Risk Management Agency (RMA) each year for each crop. McLean County's expected yield for 2005 is 159.1 bu. (see Figure 1).

Figure 1. McLean County Illinois Corn Example. 2004.

Situation:	
Crop	Corn
County	McLean County, Illinois
Expected county yield	159.1 bu.
Expected price*	$2.30
Expected revenue*	$366
Coverage level:	90%

* Estimated. Not known at the time of writing.

The **expected price** is set by averaging settlement prices for the last five trading days in February on Chicago Board of Trade (CBOT) futures contracts. The December contract on corn and the November

contract on soybeans is used in price determination. This fact sheet was revised in January 2005. Hence, the 2005 expected price is not known. The $2.30 price represents the trading level of December contract towards the end of January. (Note that the expected price's determination period differs from the period on farm-level revenue products (i.e., CRC, IP, RA). These products average settlement prices for the entire month of February rather than the last five days for GRIP. Therefore, the expected price for GRIP and the farm-level products can differ.)

Expected revenue equals the expected yield times the expected price. The $366 for the McLean county example results from multiplying the expected county yield (159.1) times the expected price ($2.30). Because the expected price is not known prior to the end of February, expected revenue also is not known before the end of February.

The **coverage level** is selected by the farmer when signing up for policy. Coverage levels can range from 70% and 90% in five percent increments. The example uses the highest coverage level of 90%.

Trigger Yields and Revenues

Trigger yields and revenues determine when insurance policies make payments. Each product has a different trigger calculation (see Figure 2).

Figure 2. Trigger Calculations for Group Products

Policy	Trigger Calcuation
GRP	expected yield x coverage level
GRIP-NoHR	expected yield x expected price x coverage level
GRIP-HR	expected yield x higher of expected price or harvest price x coverage level

GRP makes payments when county yield falls below a trigger yield. The trigger yield equals the expected yield times the coverage level. For the McLean County example, the trigger yield is 143 bu (159.1 expected yield x .90 coverage level)

GRIP-NoHR makes payments when county revenue falls below trigger revenue. The trigger revenue equals the expected revenue (expected yield x expected price) times the coverage level. For the McLean County example, the trigger revenue is $329 (159.1 expected yield x $2.30 expected price x .90 coverage level).

GRIP-HR also makes payments when county revenue falls below trigger revenue. Under GRIP-HR, however, trigger revenue is calculated using the higher of the expected price or the harvest price (Harvest price is further described in the "Indemnity Payments" section). The minimum GRP-HR trigger revenue is known after the expected price is announced and equals the GRP-NoHR trigger revenue. For the McLean County example, the minimum trigger revenue is $329 (159.1 expected yield x $2.30 expected price x .90 coverage level). Under GRP-HR, trigger revenue can increase if the harvest price is greater than the expected price.

Protection Level

Beside the coverage level, a protection level must be selected when purchasing a group policy. The protection level is a per acre dollar value that influences payments and premiums. A higher protection level has higher indemnity payments, when they occur, and higher premiums than a lower protection level. Changes in the protection level have a proportional effect on payments and premiums. A protection level that is 10% lower than another production level will have 10% lower indemnity payments and premiums than the higher protection level.

Figure 3 shows estimates of the maximum protection levels for the 2005 McLean County example. The GRP maximum is $516. The RMA sets this maximum by multiplying the expected county yield times a GRP price ($2.35 in 2004) times 1.5. The estimated GRIP maximum is $549 and is determined by multiplying the expected yield times the expected price times 1.5. The GRIP maximum protection level is not known until early March because the expected price is not determined until after February.

Figure 3. Maximum Protection Levels, McLean County, Illinois, 2004.

GRP Maximum	$561
GRIP Maximum *	$549

* Estimated maximum. The actual maximum may differ from this estimate.

Farmers can choose between 100% of the maximum protection level down to 60% of the maximum. This range allows farmers to choose a protection level that matches their farms needs. In theory, farms with higher yields should choose higher protection levels than farms with lower protection levels. In practice, the amount of premium a farmer wishes to pay likely determines the protection level.

Indemnity Payments

Figure 4 shows the methods for calculating indemnity payments for the three alternatives.

Figure 4. Methods for Calculating Indemnity Payments When Below Trigger Yields or Revenues.

Policy	Indemnity Payment
GRP	protection level x percent yield shortfall
GRIP-NoHR	protection level x percent revenue shortfall*
GRIP-HR	protection level x percent revenue shortfall* x factor

* The percent revenue shortfall under GRIP-NoHR and GRIP-HR will differ in a year when the harvest price is above the expected price.

Under GRP, the protection level is multiplied by the percent yield shortfall to arrive at the indemnity payment. The percent yield shortfall equals yield below the trigger yield divided by the trigger yield. The McLean County example has a 159.1 bushel yield and, at a 90% coverage level, a trigger yield of 143 (159.1 x .90). If the actual county yield is 100 bu., the percent yield shortfall is .3007 (e.g. (143 – 100) / 143). Given a $561 protection level, the indemnity payment in this case is $169 ($561 protection level x .3007 yield shortfall).

Indemnity payments for GRIP-NoHR are calculated in a similar manner to those for GRP, except that county revenue is used rather than county yields in the indemnity calculation. County revenue for determining indemnity payments equals actual county yield times the harvest price. The harvest price for corn equals the average of the settlement prices of the December CBOT corn contract during the month of November. The harvest prices for soybeans equals the average of the settlement prices of the November

CBOT soybean contract during the month of October.

The trigger revenue for GRIP-NoHR for the McLean County example is $329 ($366 county revenue x .90 coverage level). If county revenue is $300, which would result if county yield is 150 bu. and harvest price is $2.00 per bushel, the percent revenue shortfall is .0881 (($329 trigger revenue - $300 county revenue) / $329 trigger revenue). Given a $549 protection level, the indemnity payment is $48 ($549 protection level x .0881 percent yield shortfall).

GRIP-HR indemnity payments can differ from GRIP-NoHR indemnity payments because of two provisions:

1. Trigger revenue can differ under the two policies. Trigger revenue under GRIP-HR equals the expected yield x the higher of the expected or harvest price x the coverage level. GRIP-NoHR does not have the "higher of" provision.

2. GRP-HR includes a "factor". The factor equals the higher of 1 or the harvest price divided by the expected price. If the expected price is $2.60 and the harvest price is $2.70, the factor is 1.038 (2.70 / 2.60). If the expected price is $2.60 and the harvest price is $2.00, the factor is 1 because 1 is higher than the harvest price divided by the expected price ($2.00 / $2.60 = .7692).

GRIP-NoHR and GRIP-HR will have the same indemnity payments when the harvest price is below the expected price. GRIP-HR can have higher payments than the harvest price is above the expected price.

Suppose the harvest price is $3.00 per bu. and the actual McLean county yield is 130 bu., causing revenue to be $390 (130 bu yield x $3.00 harvest price). In this case GRIP-HR has trigger revenue of $430 (159.1 expected yield x $3.00 harvest price x .90 coverage level), causing the revenue shortfall to be .0930 (($430 trigger revenue - $390 county revenue) / $430 trigger revenue). The factor is 1.304 ($3.00 price / $2.30 expected price). This gives an indemnity payment of $51 per acre ($549 protection level x .0930 yield shortfall x 1.304 factor). GRIP-NoHR does not make an indemnity payment in this example. GRIP-NoHR has trigger revenue of $329, significantly lower than GRIP-HR trigger revenue. The actual county revenue of $390 is above the GRIP-NoHR trigger revenue, resulting in no indemnity payment.

Premiums and Payments from the Group Products

A *2005 Group Crop Insurance Plan Calculator* has been developed and is available for download from the crop insurance section of *farmdoc*. This *Calculator* shows estimated per acre premiums from the group products. In addition, the *Calculator* shows average payments from the insurance products. An example of its output is shown in Figure 5.

In the yellow input section, entries of the county, crop, protection level, expected price, and volatility are made. The volatility influences the premiums of the GRIP products and will not be set by RMA until the beginning of March. The program comes with volatility defaults form 2004. Based on these input, the *Calculator* shows the expected yield, GRP maximum protection level, and GRIP maximum protection level.

The *Calculator* shows a panel giving "Estimated Producer Premiums Per Acre." These premiums are estimated because the expected price and volatility entries will not be known for certain until the beginning of March. In all cases, GRIP-HR has significantly higher premiums than GRIP-NoHR and GRP. At the 90% production level, for example, GRIP-HR has a per acre indemnity payment of $13.76 compared to a $21.27 premium for GRIP-NoHR.

Figure 5. Output from the 2005 *Group Crop Insurance Plan Calculator.*

2005 GROUP CROP INSURANCE PLAN CALCULATOR [a]
(February 2005 edition, Large)

farmdoc

Input

County:	McLean
Crop:	Corn
Protection level:	100 % of maximum
Expected price[b]:	$2.30 (2004 price was $2.93)
Volatility[c]:	0.21 (2004 volatility was .21)
Expected yield:	159.1
GRP max protection level:	$561
GRIP max protection level:	$549

Description | Input Help | Yields | Scenarios

Estimated Producer Premiums Per Acre

	Coverage Level				
	70%	75%	80%	85%	90%
GRP	2.42	3.43	4.83	6.90	10.60
GRIP-NoHR	1.38	2.63	4.97	8.24	13.76
GRIP-HR	3.68	5.53	8.87	13.44	21.27

Help

GRP Trigger Yields [d]

Coverage Level	County Yield
90%	143
85%	135
80%	127

Per Acre Average Payments Over 32 Years (Adjusted to Today's Conditions) [b]

	Coverage Level				
	70%	75%	80%	85%	90%
GRP	7.56	10.56	13.19	17.97	24.00
GRIP-NoHR	4.28	6.28	9.79	15.40	24.05
GRIP-HR	8.55	12.56	17.50	24.89	34.92

Payments | Help

GRIP-NoHR Trigger Rev [e]

Coverage Level	County Revenue
90%	$329
85%	$311
80%	$293

Net Positions (Average Payment - Producer Premium) Per Acre [c]

	Coverage Level				
	70%	75%	80%	85%	90%
GRP	5.14	7.13	8.36	11.07	13.40
GRIP-NoHR	2.90	3.65	4.82	7.16	10.29
GRIP-HR	4.87	7.03	8.63	11.45	13.65

Help

GRIP-HR Trigger Yields [f]

Coverage Level	County Yield
90%	143
85%	135
80%	127

GRIP-HR Trigger Rev [f]

Coverage Level	County Revenue
90%	$329
85%	$311
80%	$293

Developed by: Gary Schnitkey, Bruce Sherrick, and Scott Irwin. Department of Agricultural and Consumer Economics, University of Illinois.

[a] GRP stands for Group Risk Plan, GRIP-NoHR for Group Risk Income Plan without harvest revenue option and GRIP-HR for Group Risk Income Plan with harvest revenue option.

[b] This price equals settlement prices on Chicago Board or Trade Contracts during the last five days of February. Trading levels at the end of January 2005 suggest expected prices around $2.30 for corn and $5.30 for soybeans.

[c] Volatilities for 2005 may be lower than 2004 volatilities. Lower volatilities will lower premiums. The volatility will not be known until the beginning of March.

[d] Average payments are based on historical data adjusted to today's conditions. Previous performance does not necessarily indicate future performance.

[c] Unlike farm-level products, group products do not have replant provisions. Group products tend to reduce crop revenue risk less than farm-level products.

[d] GRP will make payments when county yield is below the following trigger yields.

[e] GRIP-NoHR will make payments when county revenue is below the following trigger revenues.

[f] GRIP-HR will make payments when either county yields or county revenues fall below the following triggers.

The *Calculator* shows a panel listing "Per Acre Average Payments Over the Last 32 Years." These are average payments calculated using data from 1972 through 2003. This historical data are adjusted and stated in terms of today's yields and today prices. The adjusted payments can be viewed by clicking on the "Payment" button. Because the data are adjusted to today's terms, the estimated payments do not equal historical payments. These averages provide a feel for the likely payments over time from the insurance products if history repeats itself. Obviously, history does not have to repeat itself. Note that GRIP-HR has high expected producer payments. At the 90% coverage level, the expected payment for GRIP-HR is $39.95.

"Net positions" reported by the *Calculator* equal average payments minus the producer premiums. Positive values indicate that the indemnity payments, averaged over time, likely will exceed premiums paid. In the McLean County example, all group products have positive values. GRIP-HR has significantly higher values than GRIP-NoHR and GRP.

Risk Reductions Associated with Group Products

Complete risk analysis have not been completed for GRIP-HR. More complete evaluations have been conducted for GRP and GRIP-NoHR and are available from the *IFarm Crop Insurance Evaluator* available in the crop insurance section of *farmdoc*. These results show that GRP and GRIP-NoHR have significant less risk reductions than do individual farm products (APH, CRC, IP, and RA). GRIP-HR likely will have similar results to GRP and GRIP-NoHR. In addition, the group products do not have replant provisions that are available under the individual farm products.

The *Crop Insurance and Marketing Model* quantifies the risks and returns of alternative crop insurance and marketing strategies. This model allows analysis of the risk reductions associated with all available group products including GRIP-HR. The model is available for download in the *FAST* section of *farmdoc*.

Choice Between the Products

Group products tend to have positive net positions, meaning that over time they likely will return more in indemnity payments that are paid in premiums. Moreover, group products tend to have higher net positions than do individual products. In fact, most individual products have negative net positions. However, group products tend to have lower risk reductions than are associated with individual farm products. Choice between group and farm-level products provides farmers with a classic risk-return tradeoff. Group products offer higher returns and higher risks than farm-level products. As a result, group products are recommended for farmers who have the financial strength to withstand one year of poor crop revenues.

GRIP-HR has significantly higher net positions than GRP and GRIP-NoHR. A general rule of thumb is that GRP pays in low yielding years and GRIP-NoHR pays in years of lower prices. GRIP-HR combines the best features of both GRP and GRIP-NoHR. This comes at a cost of a significantly higher premium.

If a group product is to be purchased, GRIP-HR deserves serious consideration. As with all group products, purchases at the 90% coverage level seem warranted. If premium cost is a concern, select a protection level that matches the desired premium, realizing that indemnity payments are reduced with lower protection levels.

Summary

This document describes group insurance products. There are three group products available for use in Illinois:

1. Group Risk Plan – yield insurance,
2. Group Risk Income Plan without the harvest price option – revenue insurance whose guarantee will not increase if the harvest price is above the expected price, and
3. Group Risk Income Plan with the harvest price option – revenue insurance whose guarantee will increase when the harvest price is above the expected price.

Net positions of the group products tend to positive. However risk reductions are less from group products than from farm-level products. Group products should be used by farms in financial strong positions who can withstand one year of poor incomes. GRIP-HR is an attractive alternative among the group products.

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