Crop Revenue Coverage and Group Risk Plan—Additional Risk Management Tools for Wheat Growers*

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The Federal Agricultural Improvement and Reform (FAIR) Act, better known as "Freedom to Farm," provides for market transition payments that are independent of market prices. The new program eliminates the acreage reduction requirement and provides complete flexibility in planting of all crops except fruits and vegetables. The Crop Insurance Reform Act of 1994 prohibits ad hoc crop disaster programs unless the funds are taken from other agriculture programs.

Producers' risk exposure has increased with the elimination of deficiency payments which helped offset low prices and with the virtual elimination of disaster programs which helped offset low yields. The market transition payments that are available to FAIR participants are also at risk if congress pursues another round of budget cuts. This article examines two new multiperil crop insurance offerings, Crop Revenue Coverage (CRC) and the Group Risk Plan (GRP), that may help wheat producers manage risk. First, we will compare basic crop-hail and Actual Production History (APH) coverages and the protection they offer. Then, we will outline the additional protection offered by CRC, which is available to Nebraska wheat growers on a pilot basis for 1997. Finally we will discuss GRP, which will also be offered to Nebraska wheat growers for the first time for 1997 crop wheat.

Crop-Hail and APH Coverages

Crop insurance coverages in the past have been designed to indemnify producers when yield losses occur. However, neither the standard crop-hail policies nor the multi-peril coverages available with APH replace actual bushels lost if market prices increase above coverage levels. For example, if a farm has an expected wheat yield of 40 bushels per acre and the expected price is $4 per bushel, the expected revenue will be $160 per acre. If a crop-hail policy was taken out for $160 per acre coverage with no deductible, an indemnity payment of $160 would be paid if there was a 100 percent hail loss. With an APH policy with 75 percent coverage and an APH yield of 40 bushels per acre providing a 75 percent of 40 bushel or 30 bushel guarantee, the indemnity for a complete crop failure with a $4/bu indemnity price would be 30 bu/acre x $4/bu = $120 per acre. If, however, the market price at harvest time is $5 and the 40 bushel expected yield realized, revenue would be $200 per acre. Also, if any portion of the expected 40 bushel yield is forward priced at $4 and production falls short of the bushels forward priced, the replacement bushels will have to be purchased at the market price ($5 in our example) and the net return reduced accordingly.

The revenue for various situations for crop-hail and APH is shown in *Figure 1*:

Part A: *A complete crop loss due to hail*. An indemnity of $160 is received with crop-hail and $120 for APH based on $160 hail protection and 75 percent coverage, a 40-bushel APH, and a $4 price election for APH.

Part B: *The expected yield of 40 bushel is realized and the harvest price increases to $5 per bushel*. Crop sales are $200 per acre, exceeding the revenue if a crop loss occurs as illustrated in *Figure 1-A*.

Part C: *The actual yield is 20 bushel due to drought and the harvest price increases to $5 per bushel.* The APH insurance indemnity is $40 per acre (30 bushel guarantee - 20 bushel harvested x the price election of $4). The indemnity plus the revenue from the sale of the crop of $100 (20 bu @ $5) totals $140 per acre. No indemnity is paid with crop-hail coverage only.

Figure 1. Revenue with Crop-Hail and MPCI-APH policies for different yield and price situations.

Legend: ■ Sale of Crops   ▨ Insurance Indemnity

Revenue $/acre (y-axis: 0, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240)

Insurance Policy	Hail Only	APH Only	Hail Only	APH Only	Hail Only	APH Only	Hail Only	APH Only	Hail Only	APH Only

	A 100% Hail Loss	B Price Rise	C Drought Loss and Price Rise	D Increased Coverage with Price Rise	E Price Drop
Crop Loss					
Hail, %	100	0	0	50	0
Other, %	0	0	50	0	25
Crop					
Yield, bu/ac	0	40	20	20	30
Harvest Price, $/bu	$4.00	$5.00	$5.00	$5.00	$3.00
Crop Sales, $/ac	$0	$200	$100	$100	$90
Insurance Coverage					
Hail Protection, $/ac	$160	$160	$160	$200	$160
MPCI-APH					
Guarantee, bu/ac	30	30	30	30	30
Price, $/bu	$4.00	$4.00	$4.00	$4.00	$4.00
Indemnity Payments					
Hail (no deductible), $/ac	$160	$0	$0	$100	$0
MPCI-APH, $/ac	$120	$0	$40	$40	$0
Total Revenue					
w/Hail, $/ac	$160	$200	$100	$200	$90
w/MPCI-APH, $/ac	$120	$200	$140	$140	$90

Summary of Figure 1.

1. APH provides protection for all perils, including hail, but has a deductible of at least 25 percent. (There are other differences in the insurance contracts that are not discussed here, including crop-hail loss adjustments made based on the damaged area while multi-peril losses are determined upon the yield for the insured unit.)

2. APH coverage cannot be adjusted as prices change after the sign up deadline (September 30 for Nebraska wheat). If the market price goes up after grain is forward priced, buying replacement bushels will reduce income unless insurance coverage is increased, which is possible with crop-hail but not APH. (Replacement cost supplemental insurance can be purchased in combination with APH that increases the indemnity price for lost bushels at the harvest-time price.)

3. Neither crop-hail nor APH provide protection from low prices unless combined with forward pricing. Also, if the market price is below the insured level *(Figure 1-E)*, there may be a temptation to let the crop fail. This occurs when potential indemnities are greater than expected crop sales. This moral hazard has caused problems with the all-risk program. There is less of a problem with crop-hail since crop neglect is rarely confused with hail damage.

Part D: *Same scenario as Figure 1-C except the loss was due to hail and additional crop-hail coverage was purchased as the price went up.* Considering a hail loss of 50 percent just prior to harvest, the crop-hail indemnity is $100 (50%/100 x $200 protection). The crop-hail indemnity of $100 plus the crop revenue of $100 (20 bu @ $5) is $200, the same revenue with the expected yield *(Figure 1-B)*. The APH indemnity is $40 (10 bu @ $4) plus $100 crop sale for a total revenue of $140. The increased hail coverage makes it possible to realize the same revenue as would have been realized with no hail loss *(Figure 1-B)*. However, this outcome would be possible only if coverage is increased prior to a hail loss.

Part E: *The actual yield is 30 bushel due to drought and the price drops.* There is no insurance indemnity and the crop revenue is $90 (30 bu @ $3). Neither crop-hail nor APH protect income if prices drop and there is no yield loss.

Crop Revenue Coverage

In response to requests for added price protection in the APH program, the private sector developed and Federal Crop Insurance Corporation (FCIC, now a part of the Risk Management Agency, RMA) has approved Crop Revenue Coverage. USDA has announced that Crop Revenue Coverage (CRC) insurance will be offered as a pilot in Nebraska and six other states for the 1997 wheat crop. CRC first guarantees a minimum revenue providing protection from low yield, low price, or a combination of low yield and price. Second, CRC protection increases if the market price, as discovered in the futures market, increases between planting and harvest. The increased coverage is provided automatically and without any increase in premiums.

The CRC "base price" (planting time) for Nebraska wheat is 95 percent of the average August (1996) closing price for the Kansas City Board of Trade (KCBT) July (1997) hard red winter wheat futures contract. The CRC "harvest price" (harvest time) is 95 percent of the average June (1997) closing price KCBT July (1997) contract. The CRC harvest price movement is limited to $2 above or below the base price.

Crop Revenue Coverage versus APH

With an APH contract on wheat harvested in 1996, a grower with a 40 bushel APH yield would have been offered up to a 30 bushel guarantee (75 percent of 40 bushel) with a maximum price election of $3.55 for a protection level of $106.50. If CRC had been available for 1996 wheat, the minimum revenue protection would have been $110.10, resulting from a base price of $3.67 (95 percent of August 1995 average closing prices for the July 1996 KCBT wheat futures contract).

Because wheat prices increased between August 1995 and June 1996, the CRC harvest price was $5.47 per bushel (95 percent of the June 1996 average of the KCBT closing prices for the July 96 contract of $5.76). This would have increased the CRC policy protection from $110.10 to $164.10. The situations presented in *Figure 1* are shown in *Figure 2* with the addition of CRC and using 1996 wheat prices.

Part A: *100 percent hail loss evaluated at the CRC base price.* Here we illustrate what would happen if the harvest price is equal to the 1996 CRC base price of $3.67/bu and an equal amount of crop-hail is purchased. A 100 percent hail loss would result in a crop-hail indemnity equal to the amount of protection. APH and CRC would pay maximum indemnities. The revenue for CRC is higher than for APH because the CRC base price is higher. These price levels could be identical in some years or their relative magnitude reversed.

Part B: *No yield loss.* The revenue is $219 per acre for all alternatives based on the $5.47 harvest price of all harvested bushels. No insurance indemnities would be paid.

Part C: *Drought loss.* The CRC indemnity payment is higher than the APH payment because of the automatic increase in CRC coverage. The $3.55 APH indemnity price does not change. There is no crop-hail indemnity due.
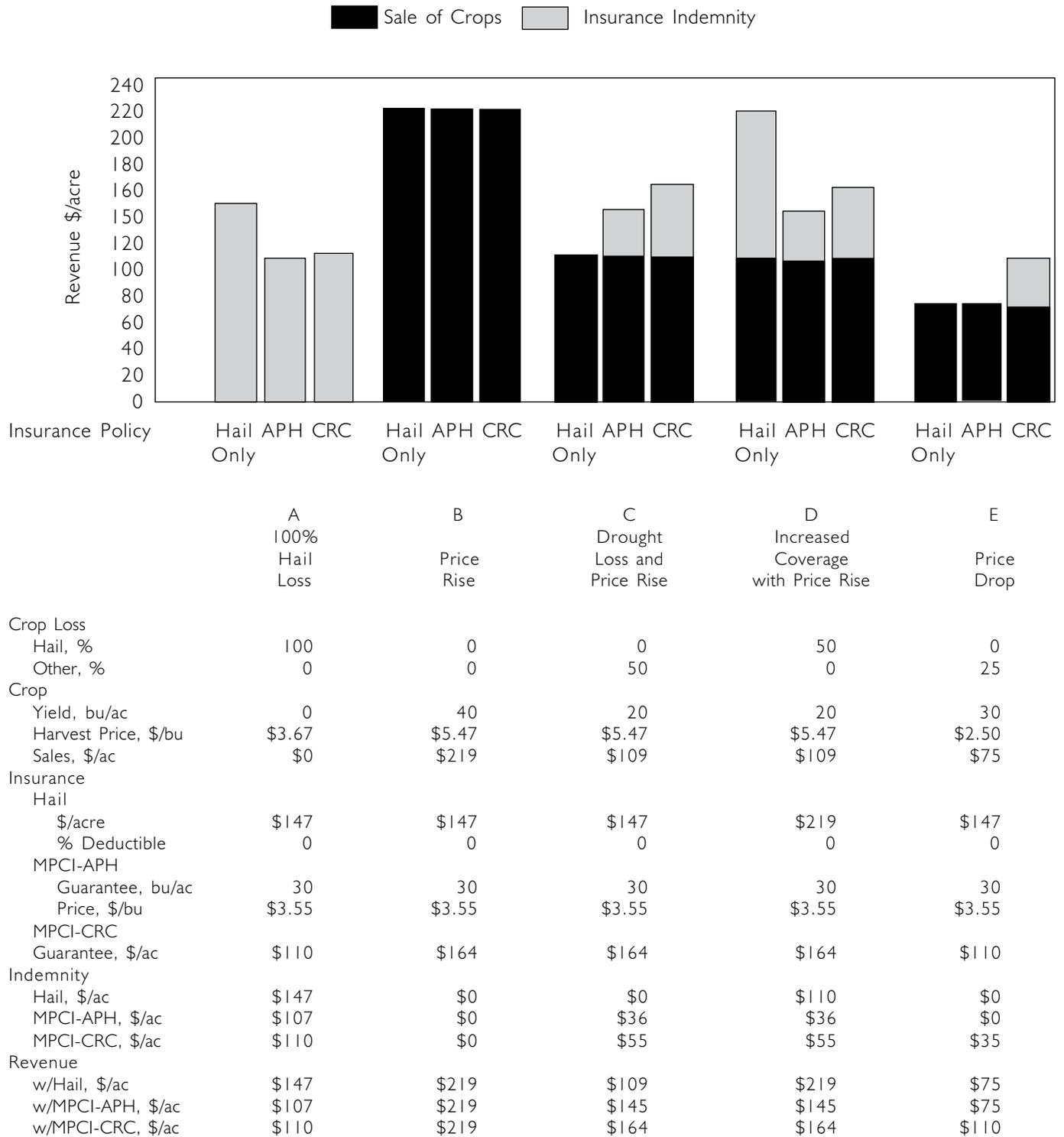
Part D: *Increased crop-hail coverage.* Increasing crop-hail coverage equal to the market price maintains the producer's revenue at the level realized with no hail loss *(Figure 2-B)*. This is possible only if all loss is due to hail and the coverage is increased prior to the hail loss. CRC coverage increases as the harvest prices increase regardless of when the loss occurs.

Part E: *Price drops.* The CRC policy would pay an indemnity of $35 because crop sales fell below the $110 minimum revenue guarantee, thereby providing protection not available with crop-hail or APH.

CRC and Forward Pricing

The problem of production falling short of forward pricing commitments has already been mentioned. To review, return to the example in *Figure 1* and consider grain that is cash forward contracted at $4 per bushel that isn't produced. If the harvest-time price is $5 per bushel, the producer would have to buy grain at $5 to meet contract commitments for a net loss of $1 for each bushel contracted at the $4 price. If the production shortfall was due to hail and the contracted production had been insured at $4 per bushel, either under crop-hail or APH, an indemnity of $4 per bushel would be received for a net of $3 per bushel after meeting contract commitments. If a futures hedge were placed by

Figure 2. Comparison of Hail, MPCI-APH, and hypothetical MPCI-CRC for 1996.

Insurance Policy	A 100% Hail Loss	B Price Rise	C Drought Loss and Price Rise	D Increased Coverage with Price Rise	E Price Drop
Crop Loss					
Hail, %	100	0	0	50	0
Other, %	0	0	50	0	25
Crop					
Yield, bu/ac	0	40	20	20	30
Harvest Price, $/bu	$3.67	$5.47	$5.47	$5.47	$2.50
Sales, $/ac	$0	$219	$109	$109	$75
Insurance					
Hail					
$/acre	$147	$147	$147	$219	$147
% Deductible	0	0	0	0	0
MPCI-APH					
Guarantee, bu/ac	30	30	30	30	30
Price, $/bu	$3.55	$3.55	$3.55	$3.55	$3.55
MPCI-CRC					
Guarantee, $/ac	$110	$164	$164	$164	$110
Indemnity					
Hail, $/ac	$147	$0	$0	$110	$0
MPCI-APH, $/ac	$107	$0	$36	$36	$0
MPCI-CRC, $/ac	$110	$0	$55	$55	$35
Revenue					
w/Hail, $/ac	$147	$219	$109	$219	$75
w/MPCI-APH, $/ac	$107	$219	$145	$145	$75
w/MPCI-CRC, $/ac	$110	$219	$164	$164	$110

Summary of Figure 2.

1. Both CRC and APH have protection levels that are limited by the minimum 25 percent deductible. Therefore, crop-hail insurance still provides greater protection from yield loss due to hail than is available under MPCI.
2. Different procedures are used to determine the indemnity price under APH and CRC. As a result, even if market prices don't change from planting to harvest, indemnities in case of low yields may differ under CRC and APH. For APH, indemnities due to low yields will begin when the yield falls below the coverage level x the APH (the APH yield guarantee). For CRC, indemnities for a low yield will begin when the yield x harvest price is below the revenue guarantee. Therefore, for a CRC harvest price below the CRC base price, CRC indemnities will be paid before reaching the APH yield guarantee.
3. CRC coverage increases when the crop market price increases. Unlike increased hail coverage, CRC increases automatically and at no added cost. Also, CRC increased coverage can take place after the yield loss has occurred while increased hail coverage is effective only when purchased prior to the damage.
4. Under CRC if the producer sells production at the CRC harvest price, the total revenue (crop sales plus any indemnity) from bushels represented by the coverage level x the APH (the APH yield guarantee) will be equal to the revenue that would have been realized if those bushels had been produced. This additional protection allows growers to pursue forward pricing alternatives more aggressively. This is discussed in the next section.
5. CRC coverage provides protection against a price drop, coverage that is not available under crop-hail or APH unless combined with forward pricing.

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selling July futures at $4.50 (a $.50 under basis) which is offset at harvest with a purchase at $5.50, the producer would again experience a $1 per bushel loss on each bushel hedged.

Under CRC, planting time coverage for 1997 harvested crop will be 95 percent of the August 96 average of the July 97 KCBT futures. Based on a $4.50 July futures adjusted for a 5 percent basis, the CRC base price is $4.28 per bushel. (The CRC base price is actually determined using a monthly average of the futures price and hence will not likely correspond with a hedge placed during that month.) Again, for grain cash forward contracted at $4 per bushel and harvest-time prices at $5 per bushel, a loss of $1 per bushel would be realized on the bushels purchased to meet the contract. A $5.50 harvest price would increase CRC to $5.22 per bushel, resulting in a net of $4.22 per bushel after meeting contract commitments. See *Table I* where a futures hedge is also illustrated. The difference between the net of $4.22 and the forward contract price of $4 assumed in our example is due to differences in the basis. In our example, CRC used a $.28 harvest-time basis (5 percent of $5.50) while the local basis assumed was $.50. If the harvest time basis is less than the 5 percent used by CRC, the net price will be less than projected when forward pricing.

As always, if the producer would have known prices were going to rise it would have been better not to forward price. The same result holds when combining CRC coverage and forward pricing. Based on the example in *Table I*, if the producer had not forward priced and the price had risen, the bushels produced would have realized $5 instead of the $4 contract price and the failed production would have realized the $5.22 indemnity instead of the $4.22 net with forward pricing. However, the objective of forward pricing is to protect the producer against lower prices. If futures prices drop from planting to harvest, forward pricing assures a price

and CRC results in the producer benefiting from forward pricing even if the grain isn't produced.

Again, based on the example in *Table I*, if the producer forward priced and the prices fall, the bushels produced would have realized the $4 contract price instead of the $3 market price and the failed production would have realized $5.28 instead of only the $4.28 indemnity. There is no penalty for doing a good marketing job under CRC and, in fact, CRC provides the security to take advantage of marketing opportunities that producers may otherwise pass up because of production shortfalls that aren't covered by hail or APH.

GRP

The group risk plan, GRP, is another addition to the risk management tools available to Nebraska wheat growers. GRP provides multi-peril coverage that is based on NASS (Nebraska Agricultural Statistics Service) county yields. The attractive features of GRP are relatively low premiums, increased coverage levels, and a minimum record requirement. Since GRP indemnities are paid based on NASS county yields, producers can purchase maximum GRP coverage without proving farm yields. Also, crop adjusting of individual units for crop loss is eliminated. The moral hazard problem is virtually eliminated with GRP since indemnity payments are not directly affected by the insured's yield. These features result in reduced costs to the insurer that can be passed on to the insured. The fact that indemnities are paid based upon NASS county yields and not the insured's yield is also its greatest disadvantage since the producer could realize a low yield while county yields are above the GRP trigger yield. However, where the insured's yield follows NASS county yields for all except perhaps hail, wind, and flood, GRP supplemented with crop-hail, for example, can be an effective and relatively inexpensive risk management alternative.

Table 1. Forward pricing with CRC.

	Futures Hedge	Sales Contract
Planting Time		
Forward Pricing	Sell July futures at $4.50	Contract July delivery at $4
CRC base price level 95% of July futures = $4.28		
Harvest Prices Rise		
Contracted/hedged bushels not produced	Buy July futures at $5.50	Buy grain at $5
Forward price net	-$1.00	-$1.00
Harvest CRC price level 95% of July futures = $5.22		
Indemnity (larger of base or harvest CRC price levels)	$5.22	$5.22
Net Price	$4.22	$4.22
Harvest Prices Fall		
Contracted/hedged bushels not produced	Buy July futures at $3.50	Buy grain at $3
Forward Price Net	+ $1.00	+ $1.00
Harvest CRC price level 95% of July futures = $3.32		
Indemnity (larger of base or harvest CRC price levels)	$4.28	$4.28
Net price	$5.28	$5.28

The maximum protection under GRP is the expected county yield x the FCIC expected market price x 1.5. Indemnity payments are based upon the percentage shortfall of the county yield compared to the trigger yield. The trigger yield is the coverage level x the expected county yield. The maximum coverage level available under GRP is 90 percent.

GRP Example for Wheat
Trigger Yield = (Coverage level/100) x Expected county yield
    Example expected county yield = 40 bu/acre
    Example coverage level = 90%
    Trigger yield = 90% of 40 bu = 36 bu/acre

Maximum protection per acre = Expected county yield x FCIC price x 1.5
    1997 crop wheat GRP Price = $3.85
    Maximum protection = 40 bu x $3.85 x 1.5 = $231/acre (which is twice the maximum protection available with APH coverage at $3.85 per bushel)

Policy protection = Any amount between 60 and 100% of maximum protection
    Example protection level = 100%
    Policy protection = 100% of $231 = $231/acre.

Payment factor = (Trigger yield - actual county yield) / Trigger yield if actual county yield below trigger yield
    Example actual county yield = 30 bu/acre
    Payment factor = (36-30)/36 = .1667

Indemnity payment = Policy protection x payment factor = $231 x .1667 = $38.51/acre

Note that the GRP indemnity payment does not depend on the producer's own yield. Thus, GRP insurance will provide protection from low producer yield only if the county yield is below the expected county yield at the same time the producer's yield is low.