



www.agmanager.info
abarnaby@agecon.ksu.edu
(785) 532.1515 (phone)
(785) 532.6925 (fax)

G.A. "Art" Barnaby Jr.

Copyright 2007. All rights reserved. Contact Art to be added to e-mail list

Disclaimer: This web page is designed to aid farmers with their marketing and risk management decisions. The risk of loss in trading futures, options, forward contracts, and hedge-to-arrive can be substantial and no warranty is given or implied by the author or any other party. Each farmer must consider whether such marketing strategies are appropriate for his or her situation. This web page does not represent the views of Kansas State University.

Would you pay more in premiums than the maximum indemnity payment?¹

A person will need to read this twice for it to make any sense. **How can one pay more in premiums than the maximum indemnity?** Hopefully this analysis will provide a better understand how declining aph's have hit farmers in Kansas.

This analysis is based on the data sent to me by a Kansas wheat farmer that had suffered some recent drought losses on this particular unit. The rated aph is 16 bushels and the approved aph is 25 bushels for this unit.

Table 1 shows the effect on the declining aph combined with a rate increase. Under an APH contract, this grower can increase his coverage by \$6.13 per planted wheat acre by selecting 85% coverage versus 80% coverage, but it will cost him \$13.33 in additional premiums. This is an effective rate of \$217.63 per \$100 of coverage for coverage above the 80% level. A thousand acre wheat farmer by moving from 80% coverage to 85% coverage would increase his coverage by \$613 for the farm but pay an additional \$1,333 in premiums! Clearly with the marginal rate over 100% farmers should only consider the lower coverages if they have a declining aph with yield plugs caused by recent weather. This premium structure is a clear disincentive for purchasing higher coverage levels.

Even at the 65% coverage level, it is not a great deal because of the higher rates this farmer's effective coverage is 52%, once the premium is deducted. Also notice the effective coverage

¹Prepared by G. A. (Art) Barnaby, Jr., Professor, Department of Agricultural Economics, K-State Research and Extension, Kansas State University, Manhattan, KS 66506, September 30, 2007, Phone 785-532-1515, e-mail – barnaby@ksu.edu.

declines if he increases his coverage level because of the premium. The maximum effective coverage is at 75% and then declines starting with 80% coverage.

So it must be fraud, waste and abuse. The farm's yields for this unit and the county yields for continuous cropped wheat are reported in table 2. This farmer did not farm the land before 2002 and he planted this unit to milo in 2005. In any case his zero crop wheat yields were also in years when the county yield was approaching zero. The simple average county yield for 1980-2006 is 27.1 bushels for continuous crop wheat. So if this is fraud, waste and abuse then all farmers in this county must be doing the same thing. If it does not rain then there is no wheat produced and in Kansas that can be near zero yield at the county level; the top wheat producing state in most years.

Comparing this farmer's 65% APH coverage offer versus 85% APH coverage, he would receive an extra \$24.50 in coverage but pay an extra \$31.20 in premiums. How would the reader like to write the extra coverage as a supplemental contract?

No one would pay more than 100% premium rate for additional coverage; would they? Yes they might because if they have a unit that looks like this one but the rest of their aph's are in better shape and they buy 75% or 80% coverage. If they purchase 75% coverage they must also purchase the same coverage on this unit. This farm's average aph on the other units is 38.1 bushels, probably plus or minus 10 bushels.

The RA without the harvest price option has a lower premium rate than the APH but the premium cost per acre is higher (table 3). The reason is the price election on RA is \$5.88 versus \$4.90 for APH and the higher price election generates more dollars of coverage. So why would the premium rate be lower for revenue insurance? This is possible if there is a negative price yield correlation. When yields are low then prices tend to increase. If prices increase then it requires a larger yield loss under RA to trigger payments than is required under APH.

Farmers who add the Harvest Revenue Option to their RA contract will always be paid more than they would receive under an APH contract. If prices increase RA-HPO will trigger payments at the same yield loss as APH. Last year for each guaranteed bushel lost RA-HPO paid \$6.02 while APH paid \$3.90 for the same yield loss.

The CRC contract has the "HPO" built in to the contract but has a price limit of \$2. If the price were to increase from \$5.88 to \$8 next summer RA-HPO would pay \$8 for each lost bushel while CRC would be capped at \$7.88. Also CRC has a downside limit of \$2 on price. In the past one did not worry about the downside price limit because if prices fell by \$2, farmers were covered with the marketing loan. However in today's market if price were to fall to \$3, the CRC has a cup at \$3.88 while RA is unlimited and would continue to pay the price loss.

Comparing RA-HPO with CRC on this unit is an easy decision (Tables 4 and 5). The CRC premiums are higher than RA-HPO at all levels. At the 85% level, CRC cost \$10.19 more per acre than RA-HPO that has no price limit. Clearly this does not make sense but one would clearly select RA-HPO over CRC. Also one would not buy not buy RA-HPO above 75%

coverage because the additional premium cost will exceed the additional maximum payment. It looks like the best option for this grower is RA-HPO or RA at the 70% coverage level.

Subsidy Effect. The subsidy can cause unusual outcomes. For example if this grower increases his coverage from 65% to 85%, then his subsidy rate is 38% of the premium for the additional coverage, but the subsidy rate on the bottom 65% coverage is also 38% (the 38% subsidy applies to the premium for all of the coverage from 0 to 85%). He loses the advantage of the higher 59% premium subsidy on the 65% contract because the 38% subsidy rate applies to the entire premium for the 85% coverage, not just the additional coverage.

Therefore, it is easier to compare premiums before subsidies are added. For example the unsubsidized premium per acre for APH at the 65% coverage level is \$39.29. If the grower increases coverage to 70% the increase in coverage is \$7.66 per acre. If we assume the grower has claim rate of 100% and severity of loss of 35% or greater then the additional indemnity payment will be \$7.66 every year and the premium to cover the claim will be \$7.66 in order to maintain a 1.0 loss ratio. Assuming the 65% APH contract is rated correctly (historically, RMA started with 65% APH coverage as their base point for setting rates, and they may still use this method) then the maximum unsubsidized premium is \$45.37 per acre for 70% coverage. This premium rate assumes the grower will collect all of the coverage above the 65% level every year and the rate on the additional coverage is 100%. However, RMA charges \$46.90 or an overcharge of \$1.53 per acre and that assumes a total loss of the added coverage above the 65% level every year!

Assuming a claim rate of 100% and a severity loss of 100% on all coverage above the 65% level under an 85% CRC contract would have a maximum premium of \$95.25 per acre. This is after adding the additional liability of \$42.50 to account for price increase up to \$2. In order to meet the condition of a 100% claim rate and severity of loss for coverage above the 65% level, it not only requires the yield loss but prices will need to increase by the full \$2. A \$2 price increase at harvest has never happened, so it very unlikely that one would collect all of the liability above the 65% level every year. Even assuming a 100% claim rate and severity of loss the CRC 85% coverage level is overrated by \$13.34 per acre.

If RMA wants to argue the higher level contracts are rated correctly then the 65% contract is extremely underrated.

Farm Bill debate over “excessive” underwriting gains. This not only affects Kansas wheat farmers but is a part of the Farm Bill debate over “excessive” underwriting gains by insurance companies. RMA defines underwriting gains as premiums exceeding indemnity payments. In the long run (20 years or more) the premiums are required by law to equal indemnity payments, while in the short run anything can happen.

Seldom does one end up with such a clear example of excessive rates but for those extreme crop insurance critics who claim crop insurance can be delivered through the public sector cheaper than the private sector, is there any reason to believe the rating will improve under public sector delivery? Increasing the quota share to the government has no effect on rates and therefore farmers will receive no benefit from a quota share. If the rates were adjusted where there are

“excessive” underwriting gains, then farmers would benefit. Just retaining a quota share by RMA does not fix any underlying rating problems. Some would argue this is very bad public policy because it reduces any incentive by RMA to address the rates if they retain a quota share.

It is likely there will be cuts in the Administrative and Operating fees (A&O) paid to the crop insurance companies. The crop insurance critics have argued crop insurance could be provide better and cheaper through USDA than through private crop insurance agents. Cheaper probably depends on who is doing the accounting, but better service? Often times farmers have less than two weeks to make their crop insurance decision because that is when the price election and volatility factors are released for revenue insurance. That means all farmers would need to be process through a county office in less than two weeks (government offices are not open on the weekends and after 5 p.m. but crop insurance agent are open).

What did the real farmer do? He decided not to plant wheat on this unit and will plant it to grain sorghum next spring. He purchased 70% RA on his wheat. Apparently RMA could not get him to bite on paying the extra \$2.69 premium per acre for CRC so that he would have a \$2 price cup and cap on any payments! Any one who thinks farmers don't understand insurance have not spent much time with them. He paid less and received a contract that has no limits on price moves. Must be abuse.....

Summary. It is not unusually for an additional dollar of coverage above the 80% level to cost 25 cents or more. Collecting the additional dollar of coverage does not require one to have a zero yield; it only requires a yield loss greater than 20% to collect the extra coverage. In the case of RA without the Harvest Price Option it requires a 20% decline in revenue, which can either be caused by lower prices or lower yields.

The 20% decline in revenue also applies to CRC and RA-HPO from the minimum revenue coverage. If prices increase then the coverage for CRC and RA-HPO also increase. Under the condition of higher harvest prices it will require a 20% yield loss and requires a market price increase by the full \$2 limit in CRC in order to capture all of the additional coverage. RMA does not report the full liability in CRC, which is the guaranteed bushels times the base price **plus the \$2 limit**.

RA-HPO does not have a price limit so one would need to use an estimated maximum liability (\$2 in this analysis). It is clearly not correct to omit the liability generated from HPO as RMA does when it reports CRC and RA-HPO coverage. As last year demonstrated the additional liability is clearly at risk because both CRC and RA-HPO paid losses at the higher harvest price. If one does not include the full liability that includes the additional price liability, then the analyst will over state the rate per \$100 for additional coverage under CRC and RA-HPO. If one does not adjust for the additional liability for the upside price risk, i.e. does not adjust the liability reported by RMA for the additional price liability; then it is possible to generate a rate of more than 100% on the additional coverage, so it is necessary to include the price liability to correctly evaluate the additional coverage.

Because the higher coverage provides indemnity payments on smaller losses it will generate higher unsubsidized premiums. The added premium may be justified at 100% if the additional

price liability is not included. Also one then needs to evaluate the decision after subsidies are applied because at the higher coverage levels farmers receive a lower subsidy rate on the additional coverage but they also lose the higher subsidy rate on the bottom end coverage (70% coverage or less).

This example demonstrates why the declining aph causes such a large financial hit on farmers. This farmer had a short yield history (even 10 years is not a large number of observations) and unfortunately he had crop failures in the same years that county yields were also very low. The yield plugs keep the approved aph “near” the long run average yield for the county but the increase in rates starts to make the coverage “unaffordable”. So when farmers say declining aph’s are a problem, the real problem is significantly higher rates when yield plugs are used.

Table 1. APH (MPCI) on Western Kansas Wheat Farm with a 25 bushel aph and a 16 bushel Rated Yield

Level of Coverage	APH	Cover- age per Acre	Risk Protection with 5% Higher Coverage				Higher Coverage Compared with 65% Coverage				
			Average Farmer Paid Rate per \$100 coverage	Cover- age Including Price Liability per Acre \$0.00	In-crease Coverage by 5%	Total Farmer Paid Premium per Acre	Added Farmer Paid Premium for a 5% In-crease in Cover- age	Effective Level of Coverage Min Max ¹	Rate per \$100 Coverage for Additional Coverage	Added Cover- age above 65% Cover- age	Added Premium for Cover- age above 65% Cover- age
65%	25.0	\$79.63	\$20.21	\$79.63		\$16.09		52% - 52%			
70%	25.0	\$85.75	\$22.43	\$85.75	\$6.13	\$19.23	\$3.14	54% - 54%	\$51.27	\$6.13	\$3.14
75%	25.0	\$91.88	\$27.30	\$91.88	\$6.13	\$25.08	\$5.85	55% - 55%	\$95.51	\$12.25	\$8.99
80%	25.0	\$98.00	\$34.65	\$98.00	\$6.13	\$33.96	\$8.88	52% - 52%	\$144.98	\$18.38	\$17.87
85%	25.0	\$104.13	\$45.42	\$104.13	\$6.13	\$47.29	\$13.33	46% - 46%	\$217.63	\$24.50	\$31.20

Total Premium; Includes Farmer Paid & USDA Premium Subsidy

Level of Coverage	Non-Subsidy Premium Rate per \$100 coverage	Non-Subsidy Premium per Acre	Added Non-Subsidy Premium for Each 5% Increase	Non-Subsidy Rate for additional \$100 coverage	Added Premium for Coverage above 65% Level	Non-Subsidy Rate per \$100 Additional Cover- age	Maximum Non-Subsidy Premium per Acre ²	Non-Subsidy Premium Excess of Maximum Premium ²
65%	\$49.29	\$39.24						
70%	\$54.70	\$46.90	\$7.66	\$125.04	\$7.66	125.037	\$45.37	\$1.53
75%	\$60.66	\$55.73	\$8.83	\$144.18	\$16.49	134.608	\$51.49	\$4.24
80%	\$66.64	\$65.31	\$9.57	\$156.32	\$26.06	141.844	\$57.62	\$7.69
85%	\$73.25	\$76.27	\$10.97	\$179.04	\$37.03	151.144	\$63.74	\$12.53

¹Under APH there is no increase in coverage when harvest prices increase therefore the net coverage is gross indemnity payment less premium paid.

²The maximum premium was based on the assumption the 65% rate was correct and that all coverage above 65% had a 100% claim rate and a 100% severity of claim. This means the farmer would collect 100% of the coverage above 65% every year in addition to the claims paid on the 65% contract. The unsubsidized premiums for coverage greater than 65% in many cases exceeded the added claims.

Table 2. County Yields for Continuous Cropped Wheat and Farm's Yields

Year	County	Farm Yield	aph with Plugs
2002	16.3	31.0	31.0
2003	36.0	32.0	32.0
2004	1.3	0.0	18.6
2005	25.7	Milo	Milo
2006	8.5	0.0	18.6
Rated APH / APH		16	25

Table 3. RA on Western Kansas Wheat Farm with a 25 bushel aph and a 16 bushel Rated Yield

Risk Protection with 5% Higher Coverage										Higher Coverage Compared with 65% Coverage		
Level of Coverage	APH	Coverage per Acre	Average Farmer Paid Rate per \$100 coverage	Coverage Including Price Liability per Acre \$0.00	Increase Coverage by 5%	Total Farmer Paid Premium per Acre	Added Farmer Paid Premium for a 5% Increase in Coverage	Effective Level of Coverage		Rate per \$100 Coverage for Additional Coverage	Added Coverage above 65%	Added Premium for Coverage above 65%
								Min	Max ¹			
65%	25.0	\$95.55	\$18.60	\$95.55		\$17.77		53% - 53%				
70%	25.0	\$102.90	\$20.19	\$102.90	\$7.35	\$20.78	\$3.01	56% - 56%	\$40.95	\$7.35	\$3.01	
75%	25.0	\$110.25	\$24.06	\$110.25	\$7.35	\$26.53	\$5.75	57% - 57%	\$78.23	\$14.70	\$8.76	
80%	25.0	\$117.60	\$30.15	\$117.60	\$7.35	\$35.46	\$8.93	56% - 56%	\$121.50	\$22.05	\$17.69	
85%	25.0	\$124.95	\$38.97	\$124.95	\$7.35	\$48.69	\$13.23	52% - 52%	\$180.00	\$29.40	\$30.92	

Total Premium; Includes Farmer Paid & USDA Premium Subsidy

Level of Coverage	Non-Subsidy Premium Rate per \$100 coverage	Non-Subsidy Premium per Acre	Added Non-Subsidy Premium for Each 5% Increase	Non-Subsidy Rate for each additional \$100 coverage	Added Premium for Coverage above 65% Level	Non-Subsidy Rate per \$100 Additional Coverage	Maximum Non-Subsidy Premium per Acre ²	Non-Subsidy Premium Excess of Maximum Premium ²
65%	\$45.36	\$43.34						
70%	\$49.25	\$50.68	\$7.34	\$99.88	\$7.34	99.8839	\$50.69	(\$0.01)
75%	\$53.47	\$58.96	\$8.27	\$112.55	\$15.61	106.218	\$58.04	\$0.91
80%	\$57.99	\$68.19	\$9.24	\$125.67	\$24.85	112.702	\$65.39	\$2.80
85%	\$62.85	\$78.53	\$10.34	\$140.68	\$35.19	119.697	\$72.74	\$5.79

¹Under RA there is no increase in coverage when harvest prices increase therefore the net coverage is gross indemnity payment less premium paid.

²The maximum premium was based on the assumption the 65% rate was correct and that all coverage above 65% had a 100% claim rate and a 100% severity of claim. This means the farmer would collect 100% of the coverage above 65% every year in addition to the claims paid on the 65% contract. The unsubsidized premiums for coverage greater than 65% in many cases exceeded the added claims.

Table 4. RA-HPO on Western Kansas Wheat Farm with a 25 bushel aph and a 16 bushel Rated Yield

Level of Coverage	APH	Cover- age per Acre ¹	Risk Protection with 5% Higher Coverage					Higher Coverage Compared with 65% Coverage							
			Aver- age Farmer Paid Rate per \$100 coverage	Cove- rage Including Price Liability per Acre \$2.00	In-crease Cover- age by 5%	Total Farmer Paid Premium per Acre	Added Farmer Paid Premium for a 5% In-crease in Cover- age	Rate per \$100 Coverage for Addi- tional Coverage	Added Cover- age above 65% Cover- age	Added Prem- ium for Cover- age above 65% Cover- age	Effective Level of Coverage Min Max ²				
65%	25.0	\$95.55	\$16.55	\$128.05		\$21.19									
70%	25.0	\$102.90	\$17.90	\$137.90	\$9.85	\$24.69	\$3.50	53% - 57%	\$35.53	\$9.85	\$3.50				
75%	25.0	\$110.25	\$21.24	\$147.75	\$9.85	\$31.38	\$6.69	54% - 59%	\$67.92	\$19.70	\$10.19				
80%	25.0	\$117.60	\$26.52	\$157.60	\$9.85	\$41.79	\$10.41	52% - 59%	\$105.69	\$29.55	\$20.60				
85%	25.0	\$124.95	\$34.12	\$167.45	\$9.85	\$57.14	\$15.35	46% - 56%	\$155.84	\$39.40	\$35.95				

Total Premium; Includes Farmer Paid & USDA Premium Subsidy

Level of Coverage	Non-Subsidy Premium Rate per \$100 coverage	Non-Subsidy Premium per Acre	Added Non-Subsidy Premium for Each 5% Increase coverage	Non-Subsidy Rate for each additional \$100 coverage	Added Premium for Cover- age above 65% Level	Non-Subsidy Rate per \$100 Addition- al Cover- age	Maximum Non-Subsidy Premium per Acre ³	Non-Subsidy Premium Excess of Maximum Premium ³
65%	\$40.36	\$51.68						
70%	\$43.67	\$60.22	\$8.54	\$86.67	\$8.54	86.6658	\$61.53	(\$1.31)
75%	\$47.20	\$69.73	\$9.51	\$96.59	\$18.05	91.6264	\$71.38	(\$1.65)
80%	\$50.99	\$80.37	\$10.63	\$107.94	\$28.68	97.0642	\$81.23	(\$0.87)
85%	\$55.04	\$92.16	\$11.80	\$119.76	\$40.48	102.737	\$91.08	\$1.08

¹RMA does not include price liability in their reported dollars of coverage that is included in CRC and can be added with the Harvest Price Option to RA. Clearly this is not correct as demonstrated last year when both CRC and RA-HPO paid losses at the higher harvest price. The maximum liability (maximum indemnity payment) for CRC wheat is percent coverage level times aph times (base price + \$2). The maximum liability (maximum indemnity payment) is undefined in RA-HPO so one would need to estimate the likely price increase. The historical maximum was \$1.85 for CRC and \$1.50 for RA. The analysis used \$2 for the maximum likely price increase for RA-HPO.

²If the harvest price is higher than the base price, then the dollars of coverage increase. However, the premium paid does not change so the net coverage also increases (gross indemnity payment less premium paid).

³The maximum premium was based on the assumption the 65% rate was correct and that all coverage above 65% had a 100% claim rate and a 100% severity of claim. This means the farmer would collect 100% of the coverage above 65% every year including the additional coverage caused by a \$2 price increase in addition to the claims paid on the 65% contract. The unsubsidized premiums for coverage greater than 65% in many cases exceeded the added claims.

Table 5. CRC on Western Kansas Wheat Farm with a 25 bushel aph and a 16 bushel Rated Yield

Level of Coverage	APH	Cover- age per Acre ¹	Risk Protection with 5% Higher Coverage					Higher Coverage Compared with 65% Coverage							
			Aver- age Farmer Paid Rate per \$100 coverage	Cove- rage Including Price Liability per Acre \$2.00	In-crease Cover- age by 5%	Total Farmer Paid Premium per Acre	Added Farmer Paid Premium for a 5% In-crease in Cover- age	Rate per \$100 Coverage for Addi- tional Coverage	Added Cover- age above 65% Cover- age	Added Prem- ium for Cover- age above 65% Cover- age	Effective Level of Coverage Min Max ²				
65%	25.0	\$95.55	\$17.88	\$128.05		\$22.90									
70%	25.0	\$102.90	\$19.85	\$137.90	\$9.85	\$27.38	\$4.48	51% - 56%	\$45.48	\$9.85	\$4.48				
75%	25.0	\$110.25	\$24.18	\$147.75	\$9.85	\$35.72	\$8.34	51% - 57%	\$84.67	\$19.70	\$12.82				
80%	25.0	\$117.60	\$30.69	\$157.60	\$9.85	\$48.37	\$12.65	47% - 55%	\$128.43	\$29.55	\$25.47				
85%	25.0	\$124.95	\$40.21	\$167.45	\$9.85	\$67.33	\$18.96	39% - 51%	\$192.49	\$39.40	\$44.43				

Total Premium; Includes Farmer Paid & USDA Premium Subsidy

Level of Coverage	Non-Subsidy Premium Rate per \$100 coverage	Non-Subsidy Premium per Acre	Added Non-Subsidy Premium for Each 5% Increase	Non-Subsidy Rate for each additional \$100 coverage	Added Premium for Cover- age above 65% Level	Non-Subsidy Rate per \$100 Addition- al Cover- age	Maximum Non-Subsidy Premium per Acre ²	Non-Subsidy Premium Excess of Maximum Premium ²
70%	\$48.43	\$66.78	\$10.93	\$110.93	\$10.93	110.932	\$65.70	\$1.08
75%	\$53.72	\$79.38	\$12.60	\$127.89	\$23.52	119.412	\$75.55	\$3.82
80%	\$59.02	\$93.02	\$13.64	\$138.49	\$37.17	125.772	\$85.40	\$7.62
85%	\$64.85	\$108.60	\$15.58	\$158.15	\$52.74	133.866	\$95.25	\$13.34

¹RMA does not include price liability in their reported dollars of coverage that is included in CRC and can be added with the Harvest Price Option to RA. Clearly this is not correct as demonstrated last year when both CRC and RA-HPO paid losses at the higher harvest price. The maximum liability (maximum indemnity payment) for CRC wheat is percent coverage level times aph times (base price + \$2). The maximum liability (maximum indemnity payment) is undefined in RA-HPO so one would need to estimate the likely price increase. The historical maximum was \$1.85 for CRC and \$1.50 for RA. The analysis used \$2 for the maximum likely price increase for RA-HPO.

²If the harvest price is higher than the base price, then the dollars of coverage increase. However, the premium paid does not change so the net coverage also increases (gross indemnity payment less premium paid).

³The maximum premium was based on the assumption the 65% rate was correct and that all coverage above 65% had a 100% claim rate and a 100% severity of claim. This means the farmer would collect 100% of the coverage above 65% every year including the additional coverage caused by a \$2 price increase in addition to the claims paid on the 65% contract. The unsubsidized premiums for coverage greater than 65% in many cases exceeded the added claims.