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Group Risk Income Protection Plan and Group Risk Plans added in New Kansas Counties for 2005¹
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The Risk Management Agency (RMA), an agency of USDA, has announced a new insurance product titled, Group Risk Income Protection plan (GRIP) for Kansas and other Great Plains States. This is a revenue based insurance product that is built on the Group Risk Plan (GRP). The GRP plan has been available in Kansas for several years but was expanded in to new Kansas and other Great Plains counties for spring 2005 signup. There are now 17 Kansas corn counties that have GRP and GRIP available for 2005. Most of the counties, in Kansas, have GRP and GRIP coverages available for grain sorghum. GRIP and GRP are available for soybeans in about a fourth of the eastern Kansas counties (figures 1, 2, and 3).

The simplest description of GRP is that it is a "put option" on expected county yield. The GRIP contract is a "put option" on expected county revenue. Like a price option the grower carries the basis risk, which is the difference between the percent county yield loss and the percent farm level yield loss.

GRP and GRIP provide reasonable protection for drought, freeze, and excess moisture. However, GRP and GRIP do not provide reasonable protection for hail, flood, prevented planting, replant, quality loss adjustment, or any other spot losses.

Kansas growers who have suffered several consecutive crop losses have discovered their Actual Production History (APH) has been reduced. Without the 60 percent of the T-yield cup, the actual APH yield would have declined even more. However, growers are charged premiums

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based on their “actual” or rated APH, while the guarantee is based on the higher APH that contains the cups. As a result many growers have discovered their coverage is so low they have very little protection left in their APH based contract. Growers’ guarantees have declined and their premium rates have increased. If coverage is so low there is “little” protection provided by the APH based products then a better alternative maybe either the GRP or the GRIP contract that are based on at least 30 years of county yield history. GRIP/GRP may offer better coverage at a lower premium then is available under APH based products because the APH has been beaten down caused by multiple year crop disasters.

Growers who elect to purchase GRIP/GRP must manage the basis risk that is retained by growers and is not covered by the contract. Growers can suffer a total crop loss and receive no payment under GRIP/GRP simply because the county yield did not decline sufficiently to trigger indemnity payments. GRIP/GRP will provide the most risk protection when the farm level yields are highly correlated with the county level yields. In other wards, growers who have low yields in years when the county also suffers a low yield will be able to transfer risk better through these contracts then will growers whose yields do not follow county yields.

The greatest risk under GRIP/GRP is probably hail risk. In order to have hail in Kansas (Great Plains) it requires thunderstorms, so while an individual farm’s crop acreage is being hailed out and yield is approaching zero, the rest of the county is likely receiving rain that is increasing county yields. The result is no farm level yield combined with a higher county yield causing no payments for either GRP or GRIP.

Producers can do things to manage the basis risk in GRIP/GRP. Growers who purchase GRIP/GRP may supplement their coverage with private hail insurance. Growers who chose not to buy private hail insurance will carry the basis risk created by hail damage under the GRIP/GRP contract.

Producers may also reduce their basis risk by purchasing a lower deductible under GRIP/GRP and will likely wish to do so simply because county yields will vary less under most conditions then farm yields. Producers may also purchase more dollars of protection and offset an expected lower variability in county yields. For example, assuming that the percent county yield loss is a smaller percentage than farm level yield loss, growers may reduce this basis risk by simply multiplying the smaller county percentage loss times a larger dollar protection amount. This protection multiplier will generate a similar indemnity payment as available under an APH based product. In most locations, it appears that GRIP will be preferred over GRP but GRIP does carry a higher premium cost.

GRIP/GRP has little or no moral hazard in the product. This is because growers who reduce their inputs or change management practices, in order to increase their chances of insurance payments will not be able to collect under the GRIP/GRP program unless all growers in the county follow a similar management practice.

The GRIP/GRP programs do not penalize growers who have historical yields that are greater than the county average yields. For example, if the county has a 40 bushel average yield and the grower has a 50 bushel average yield and in a loss year the grower raised 25 bushels but the county yield is 20 bushels then both the county and grower have suffered a 50 percent loss. Because GRP measures the loss in percentage terms in this example it would not make any difference if the grower had an individual APH guarantee or the GRP option type coverage based

on expected county yields.² Therefore, there is no penalty for growers that have above average county yields nor for growers who have below average county yields. GRIP/GRP provide risk protection only if farm level yields and county yields are correlated.

In most cases, one would not expect for the percent county loss to be the same percentage as the percent farm level yield loss. Under most conditions the farm level percent yield loss will be greater than the percentage county yield loss.

Example GRP Calculations. In order to understand GRIP one must first understand GRP. An example, of the calculations for the GRP program are presented in table 1. In this example, the trend adjusted expected county yield was 127.8 bushels. Over the past 30 years, corn yields have been trending up at a rate of about 1 ½ to 2 bushels per year caused by better technology. When one adjusts for trend yield it would not be uncommon for the expected county yield to be higher than the 10 year average yield. Also, if there have been recent crop disasters then the expected county yield based on 30 or more years of yield history could be substantially higher than the average yield based on 10 years or less.

GRP defines the payment trigger yield as being equal to the trend adjusted expected county yield times the percent coverage. In the example, one would multiple the expected county yield of 127.8 bushels times 90 percent generating a trigger yield of 115 bushels (table 1). The liability in a GRP contract equals the GRP price election³ times the expected yield. In the example calculations it was assumed that the GRP price election was \$2.30. This year's 2005 GRP price election for corn was \$2.35.

In our example one multiplies the \$2.30 GRP price election times the expected county yield of 127.8 bushels generating a liability amount of \$293.94. The producer may increase the coverage by selecting up to 150 percent of the liability amount defined above generating the maximum dollars of protection offered under GRP. If one multiplies the expected county liability of \$293.94 times 150 percent the result is \$441 of maximum available protection under GRP. In addition, RMA sets a minimum that equals 60 percent of the maximum or \$265 in this example.

Calculating a GRP payment requires one to subtract the current county yield from the trigger yield and then divide by the trigger yield times the dollars of protection. For example, if the county has a 25.3 percent loss below the expected county yield of 127.8 bushels and a grower in that county suffers a 51% yield loss below the example grower's APH, then the results are as follows for GRP and MPCl-APH.⁴ Under GRP the producer would be paid based on a trigger yield of 115 bushels minus the current county yield of 95.5 bushels divided by the 115 bushel

²GRIP uses the same county yield measurement as GRP. GRIP uses futures prices similar to Revenue Assurance to convert GRP to a revenue insurance product but the yield measurements are based on county yields not farm level yields.

³GRP price election is set by RMA and is not the same price election used for the APH product, which is the renamed MPCl product.

⁴The Multiple Peril Crop Insurance (MPCl) was renamed APH, but Actual Production History (APH) is also the term for the proven yield that is used by the Revenue Assurance, Crop Revenue Coverage and Income Protection products. To avoid confusion over the terms, MPCl-APH in this paper refers to the insurance product and APH refers to the proven individual farm level yield.

trigger yield equaling 17 percent times the selected dollars of protection of \$265.00 generating an indemnity payment of \$45.05 (table 2).

If this grower selected 75 percent MPCl-APH coverage then the following calculations would be completed to generate the indemnity payment. One would multiple 125 bushel APH times 75 percent minus the current farm level production of 61.2 bushels (this represents a 51 percent loss below the 125 bushel APH) that would equal 32.6 indemnity bushels. One multiplies the 32.6 indemnity bushels times the \$2.30 price assumed price election equaling \$74.98 (table 2).

It would appear that this is not a great deal from the grower's perspective because the grower's loss at the farm level is \$74.98 but GRP only paid \$45.05. So the question is can growers do anything to manage this basis risk where the farm loss is greater than the loss measured by the county index? While one cannot eliminate all of the basis risk, growers can certainly minimize the basis risk. The two ways to reduce the basis risk is to reduce the deductible on the contracts and to select a higher protection multiplier. In this example, GRP is at the lowest deductible 10 percent or 90 percent coverage. This 90 percent GRP contract is being compared to a 75 percent MPCl-APH contract. The reason these coverage levels were selected is because both of these contracts would receive a 55 percent premium subsidy suggesting that RMA considers these two coverages to provide similar protection.

In most cases the farm level yield variability will be greater than the county yield variability. Therefore, even if the farm level yields are correlated with the county yield there is a basis risk that is created if the expected county yield loss is less than the expected farm level yield loss. Growers can reduce their exposure to this basis risk by increasing their protection multiplier by up to 150 percent, combined with the lower deductible.

In this example, with a 115 bushel trigger yield minus 95.8 bushel current county yield divided by the 115 bushel trigger yield equals 17 percent or the same previous GRP payment rate calculation. The growers may select a protection multiplier up to 150 percent times the expected county liability of \$294 generating \$441 of protection in this example (table 3). The \$441 of protection is multiplied times the 17 percent GRP payment rate generating an indemnity payment of \$74.97 (table 3). Notice that by increasing the dollars of protection using the 150 percent multiplier the indemnity payment is the same for MPCl-APH as it is for GRIP. As stated earlier, growers may select any amount of coverage between the minimum and the maximum dollars of protection as set by RMA. By selecting the higher dollar protection amount the grower was able to offset some, in this case, all of the basis risk even though the percent county loss was smaller than the percent farm level loss, i.e. 25.3 percent versus 51 percent. Multiplying the smaller percent county loss times a larger dollar amount of protection generated an indemnity payment that was the same under both contracts.

The maximum dollars of protection of \$441, in this example, is probably a little misleading because it is very unlikely that producers would be able to collect all \$441 of coverage. That would require a county yield loss of 100 percent. It is very unlikely that county yields will drop below 50 percent of the expected county yield. Probably a more realistic percent decline in county yields is in the 25-35 percent range when crop yields are poor.

Example GRIP Calculations. Growers in Kansas who produce crops in the counties eligible for GRP are also eligible for the Group Revenue Income Protection (GRIP) contract on those same crops. The GRIP prices are also different from the prices used to settle revenue insurance. The GRIP contract's price elections are based on the last 5 trading days in February for new crop futures (Chicago Board of Trade (CBOT) December corn futures contract set the GRIP corn price

election). By contrast, the Revenue Assurance (RA) and Crop Revenue Coverage (CRC) corn price election set at signup time is based on the February average price of CBOT December corn. Because RMA is measuring these price elections in different time periods, this year's corn price for these two contracts is slightly different, \$2.32 for RA/CRC versus \$2.38 for GRIP. However, there was a substantial difference in the soybean price elections. The RA/CRC soybean price election was \$5.53 versus \$5.99 for GRIP.

In order to remove the effect of the price elections on the analysis, the same price election of \$2.30 was used for all contracts. It has also been suggested RMA use the same price election for GRIP, RA, and CRC to reduce administrative, training, software development, etc. costs and would simplify the crop insurance program. The most likely selected price would be the February average closing prices of the new crop futures contract, and this price calculation was applied to all revenue products in the analysis.

GRIP uses the same definition for harvest price as RA or the November average closing price of the December corn futures contract. GRIP's harvest price for grain sorghum is based on the October average closing prices of December corn futures and then adjusted by USDA's grain sorghum-corn price ratio forecast.

GRIP uses the GRP expected county yield for generating the expected county revenue. Like GRP, GRIP is a "put option" on expected county revenue and growers carry the basis risk between county revenue and farm level revenue. It is possible for growers with a GRIP contract to suffer a total crop loss and receive no payment causing a concern by their lender. However, the reverse is also true; growers can also suffer no crop loss and still receive a GRIP or GRP payment.

Under GRIP one first calculates the expected county revenue that is equal to the expected county yield as defined above under GRP times the February price currently defined as the last 5 trading days in February. The expected county revenue, in this example, will equal 127.8 bushel expected county yield times an assumed GRIP price election of \$2.30 equaling \$293.94. The maximum liability or protection equals the expected county revenue times a maximum of 150 percent. Multiplying the expected county revenue of \$293.94 times 150 percent equals \$441 of maximum GRIP protection assuming a \$2.30 futures price election and a 127.8 bushel expected county yield. Growers may purchase from 60 to 100 percent of the maximum dollars of protection (table 4).

GRIP defines the payment trigger revenue as being equal to the trend adjusted expected county yield times the price election based on the last 5 trading days in February times the grower's selected percent coverage. The GRIP indemnity payment will equal the trigger revenue minus current year county revenue divided by trigger revenue times the growers selected dollars of protection.

Again, assuming the county has a 25.3 percent yield loss from the 127.8 bushel expected county yield and the grower suffers a 51 percent farm level yield loss. The GRIP payment, under this scenario, would equal the expected county yield of 127.8 bushels times \$2.30 times 90 percent minus the current county revenue that equals the current year's county yield of 95.5 bushels times the November average price of December corn assumed to be \$2.60 in this example. The product of the previous calculation is divided by the trigger revenue of \$264.55 equaling a 6.1 percent GRIP payment rate (table 5). The GRIP payment rate is multiplied by the grower's selected dollars of protection, assumed to be \$264.55 in this example generating a GRIP indemnity payment of \$16.14. By contrast the MPC-I-APH contract for this same farm under this same

scenario generated an indemnity payment of \$74.98 as described above. Under these conditions, GRIP does not look like a very good deal compared to MPCI-APH. In fact, GRIP paid a smaller indemnity payment than the GRP contract under the same scenario.

GRIP is like RA without the harvest price option, when harvest prices increase it has the effect of reducing any indemnity payment and requiring a larger county yield loss to trigger payments. However, GRIP also allows growers to buy a Harvest Revenue Option (GRIP-HRO) that is a similar concept to buying the harvest price option on an RA contract. Instead of a GRIP contract, if we assume our example grower purchased a GRIP-HRO contract then the first step in calculating an indemnity payment is to calculate the harvest revenue option factor that is equal to the greater of the harvest price divided by the spring signup price election or 1.0. In our example, one would divide the harvest price of \$2.60 by the spring signup price election of \$2.30 generating a factor of 1.13 that is greater than the minimum factor of 1.0 (table 6).

If our example grower had purchased GRIP-HRO under this same scenario the county yield would have been 25.3 percent below the expected county yield, while the grower suffered a farm level yield loss that is 51 percent below the grower's APH. The GRIP-HRO indemnity payment would equal the expected county yield of 127.8 bushels times the harvest price of \$2.60 times 90 percent coverage minus the current county yield of 95.5 bushels times the harvest price of \$2.60. That product is divided by the expected county harvest revenue of \$299.05 equaling 17 percent times dollars of protection of \$293.94 times our harvest price adjustment factor of 1.13 equals a GRIP indemnity payment of \$56.46. If this grower had purchased an additional 132.8 percent protection multiplier (maximum 150%); GRIP would have generated an indemnity payment of \$74.98. GRIP indemnity payment now equals the MPCI-APH indemnity payment of \$74.98 as described for this same farm under this same yield scenario.

If this same grower had purchased the maximum additional multiplier of 150 percent rather than 132.8 percent the result would have been an indemnity payment of \$84.70 and would have exceeded the MPCI-APH indemnity payment on the same yield loss scenario. In summary, similar to GRP the GRIP insured growers can minimize their basis risk by purchasing lower deductibles and increasing their coverage by up to 150 percent. The harvest revenue option provides GRIP insured growers an additional tool for managing basis risk. The harvest revenue option will likely be more valuable in areas where county yields are negatively correlated with market prices. This is likely the case on Kansas wheat but doubtful on Kansas corn or grain sorghum.

Analysis of Selected Kansas Counties. In some cases, people have not correctly analyzed GRIP/GRP because they simply subtracted historical county yields from the RMA set trend adjusted 2005 county yield and generated historical payments. They have concluded GRIP/GRP will make large indemnity payments based on historical county yields. This is simply not correct.

The incorrect procedure was applied in the analysis and presented in table 7. One can not compare a 1980 yield that occurred 25 years ago with a 2005 trend adjusted yield. If one does make that calculation the GRP payment rate would be 40.8% in 1980 (table 7). This procedure would greatly over estimate the expected losses because RMA takes the raw NASS county yields and trend adjusts those yields. RMA recognizes corn yields have been trending up at about 1-1 ½ bushels per year and adjust for trend yield before setting the expected 2005 county yield. If the trend adjustment were applied to the 1980 expected county yield it would have been substantially lower than the 198 bushel trend adjusted expected county yield for 2005.

If one were to trend adjust the county yield for 1980, the expected 1980 Gray county yield would have been about 125.4 bushels. Subtracting the 1980 county yield from the trend adjusted 1980 expected county yield would generate a GRP payment rate of 6.5% and not 40.8% based on a 2005 expected county yield (table 8). If one does the analysis using the 2005 expected county yield the resulting industry loss ratio is \$2.16, i.e. for every dollar (about half from USDA and the other half paid by farmers) paid in premiums, growers would collect about \$2.16 or an underwriting loss equal to \$1.16 (table 7). At the 90% coverage level growers would expect to pay a dollar in premiums and collect \$4.81! If the analysis is done correctly and the historical county yields are compared with the historical trend adjusted expected county yields, then expected loss ratio falls to \$0.32 or a 68 cent underwriting gain, not a loss. Because Gray county with no practice specified is dominated by irrigated corn yields therefore any dryland corn producers in Gray would clearly not want to purchase either GRP or GRIP (table 7).

An analysis of grain sorghum was also completed in Marshall County that has no practice specified under GRIP or GRP (table 9). GRIP generated an industry loss ratio of \$0.97 and \$0.87 for GRIP-HPO. The GRP contract generated the highest loss ratio for Marshall county grain sorghum. Sorghum grain growers would have paid in a dollar and collected \$2.16 and the industry would have had a 3 cent underwriting gain.

Some counties have a practice specified and this will create an issue for some growers. For example, Republic county corn has an irrigation only practice specified for GRIP/GRP corn. About half of the corn acres in Republic are dryland. Therefore dryland corn acres would not be eligible for GRIP/GRP. However, GRIP/GRP insured irrigated corn growers will not be able to insure their dryland acres. If growers could insure only one practice most would prefer to insure their dryland acres.

Thomas county also has the irrigated only practice specified. However, Thomas county corn production is dominated by irrigation and growers would not want to insure dryland acres under GRIP/GRP. Only if RMA offers a dryland practice in Thomas county should growers consider the GRIP/GRP contract on dryland corn.

Summary. Growers who are farming in counties who are mostly dryland but they have irrigation and there is no practice specified in the GRP/GRIP contract may find this product superior to APH based products. Because the county yield will be dominated by dryland yields under a drought scenario it is quite possible the county would suffer a yield loss but the irrigated grower would suffer little or no yield loss. One must remember this grower probably does suffer financial losses in the form of increased production costs caused by increased water pumping costs. However, because there is no farm level yield loss growers would not receive an APH based payment while they may receive payments under either GRP or GRIP.

Kansas growers who have been farming for over 20 years and never collected from crop insurance probably should consider GRIP/GRP. However, this describes very few crop producers in Kansas and most of the State is insured.

Growers that have suffered multiple year crop losses that have caused their APH to decline while increasing their APH may find the GRIP/GRP a better offer. If the grower's APH has been beaten down to the point where there is little protection left one has little to lose by switching to GRIP/GRP. If one does switch, then one should also maintain the crop production records because one may want to switch back to APH once their APH improves.

The GRIP/GRP will provide the best protection for drought, freeze, and excessive moisture. The GRIP/GRP contracts may also be preferred if the APH based products are over rated but this is not the case for most Kansas' producers but overrated APH products might be true for some growers in Corn Belt States. It is also possible that if the farm is spread out across the county, the farm level yields will track closely with the county yield. Under these conditions GRP/GRIP products will provide similar protection to an enterprise unit APH based product.

Growers must also remember GRP/GRIP provide very little or no protection for hail, wind damage, flood damage, or other spot losses. GRP/GRIP provides no prevented planting protection or replant protection. Depending on how widespread soybean rust losses are there may not be any real protection under a GRP/GRIP contract for rust. **Finally, growers must remember it is possible to suffer a total crop loss under either GRIP/GRP contracts and receive no indemnity payment.**

Table 1. Example Calculations of GRP Protection Dollars

County yield is trend adjusted to generate expected county yield

Trigger Yield = Expected County yield * % coverage

115 bu. Trigger yield= 127.8 * 90%

Liability = GRP Price Election* Expected Yield
\$293.94 = \$2.30 * 127.8 bu.

Maximum Protection = Exp. Co. Liability * max 150%
\$441 = \$293.94 * 150%

Max = 100% or \$441; Min 60% or \$265

Table 2. Example Calculations of GRP Indemnity Payments

GRP payment = (Trigger yield- current year county yield/ trigger yield) * Liability (selected \$ protection)

County has a 25.3% loss from 127.8 expected bu. and farmer suffers a 51% yield loss

GRP = (115 – 95.5) / 115 = 17% * \$265 = \$45.05

MPCI = 125 * 75% bu. Guarantee – 61.2 bu. production = 32.6 bu. * \$2.30 = \$74.98

Table 3. Example GRP Calculations with 150% Multiplier

The increased protection multiplier up to 150% and lower deductible can be used to manage basis risk

GRP = (115 – 95.8) / 115 = 17% * \$294 * 150% = \$441 = \$74.97

MPCI = 125 * 75% bu. Guarantee – 61.2 bu. production = 32.6 bu. * \$2.30 = \$74.98

Table 4. Example Calculations of GRIP Protection Dollars

Group Risk Income Protection price based on the last 5 trading days in February for December corn

The corn harvest price is the November average of December corn; Grain Sorghum harvest price is the October average of December corn adjusted by the USDA forecasted grain sorghum-corn price ratio; the soybean harvest price is the October average of November soybeans

Grain sorghum prices adjusted by USDA's GS/corn price ratio

GRIP uses the GRP expected county yield for expected county revenue

Expected County Revenue = Expected County yield * Feb Price
ECR= 127.8 * \$2.30= \$293.94

Maximum Liability = Exp. Co. Rev. * max 150%
\$441 = \$293.94 * 150%

Max = 100% or \$441; Min 60% or \$265

Table 5. Example Calculations of GRIP Indemnity Payments

GRIP payment = (Trigger revenue- current year county revenue/ trigger revenue) * selected \$ protection

County has a 25.3% loss from the 127.8 expected county bushel yield and a farmer suffers a 51% farm level yield loss

$GRIP = ((127.8 * \$2.30 * 90\%) - (95.5 * \$2.60)) / \$264.55 = 6.1\% * \$ 264.55 = \16.14

$MPCI = 125 * 75\% \text{ bu. Guarantee} - 61.2 \text{ bu. production} = 32.6 \text{ bu.} \& \$2.30 = \$74.98$

Table 6. Example GRIP Calculations with 150% Multiplier and Harvest Revenue Option (HRO)

Harvest Revenue Option (GRIP-HRO) factor = Greater of Harvest price/Spring Price, 1.0
1.13 = \$2.60/\$2.30

County has a 25.3% loss from the 127.8 expected county bushel yield and a farmer suffers a 51% farm level yield loss

$GRIP-HRO = ((127.8 * \$2.60 * 90\%) - (95.5 * \$2.60)) / \$299.05 = 17\% * (\$293.94 * 132.8\% * 1.13) = \74.98

$MPCI = 125 * 75\% \text{ bu. Guarantee} - 61.2 \text{ bu. production} = 32.6 \text{ bu.} \& \$2.30 = \$74.98$

Table 7. Gray County Corn GRP Indemnity Payments based on Non-Trend Adjusted versus Trend Adjusted Yields

RMA's 2005 Expected County Yield 198.0
 KSU's 2005 Expected County Yield 199.0
 150% Maximum Liability

Year	<u>County</u>		<u>No Trend Adjusted Yield</u>					<u>Trend Adjusted Yield</u>				
	Yield	Planted Yield	RMA set 2005 Expect Yield	90% Cov GRP Pymt Rate	APH ¹ Price	5.30% GRP Pymt	5.30% GRP Prem	Trend Adjusted Expect Yield	90% Cov GRP Pymt Rate	APH ¹ Price	GRP Pymt	5.30% GRP Prem
1980	127	105.4	198.0	40.8%	2.70	327.47	42.50	125.3	6.5%	2.70	33.11	26.90
1981	146	139.1	198.0	22.0%	2.70	176.07	42.50	128.3	0.0%	2.70	0.00	27.53
1982	139	133.9	198.0	24.8%	3.00	221.26	47.22	131.2	0.0%	3.00	0.00	31.29
1983	121	113.0	198.0	36.6%	2.70	293.55	42.50	134.2	6.4%	2.70	35.00	28.80
1984	165	134.7	198.0	24.4%	2.90	210.34	45.65	137.1	0.0%	2.90	0.00	31.61
1985	162	156.2	198.0	12.3%	2.85	104.49	44.86	140.1	0.0%	2.85	0.00	31.73
1986	177	174.8	198.0	1.9%	2.35	13.46	36.99	143.0	0.0%	2.35	0.00	26.72
1987	124	118.6	198.0	33.5%	2.00	198.80	31.48	146.0	9.7%	2.00	42.66	23.21
1988	177	175.5	198.0	1.5%	2.00	9.01	31.48	148.9	0.0%	2.00	0.00	23.68
1989	165	162.3	198.0	8.9%	2.60	68.69	40.93	151.9	0.0%	2.60	0.00	31.39
1990	166	163.0	198.0	8.6%	2.30	58.43	36.20	154.8	0.0%	2.30	0.00	28.31
1991	182	179.3	198.0	0.0%	2.30	0.00	36.20	157.7	0.0%	2.30	0.00	28.84
1992	182	176.7	198.0	0.8%	2.30	5.65	36.20	160.7	0.0%	2.30	0.00	29.38
1993	170	167.2	198.0	6.2%	2.30	42.22	36.20	163.6	0.0%	2.30	0.00	29.92
1994	195	189.0	198.0	0.0%	2.40	0.00	37.78	166.6	0.0%	2.40	0.00	31.79
1995	170	167.7	198.0	5.9%	2.25	39.27	35.42	169.5	0.0%	2.25	0.00	30.33
1996	193	190.3	198.0	0.0%	2.65	0.00	41.71	172.5	0.0%	2.65	0.00	36.34
1997	186	181.5	198.0	0.0%	2.45	0.00	38.57	175.4	0.0%	2.45	0.00	34.17
1998	193	187.9	198.0	0.0%	2.45	0.00	38.57	178.4	0.0%	2.45	0.00	34.75
1999	195	190.7	198.0	0.0%	2.15	0.00	33.84	181.3	0.0%	2.15	0.00	30.99
2000	186	180.6	198.0	0.0%	1.89	0.00	29.75	184.3	0.0%	1.89	0.00	27.69
2001	179	160.5	198.0	9.9%	1.75	51.52	27.55	187.2	4.7%	1.75	23.25	26.05
2002	179	159.4	198.0	10.5%	2.25	70.44	35.42	190.2	6.9%	2.25	44.04	34.02
2003	188	159.9	198.0	10.2%	2.40	73.06	37.78	193.1	8.0%	2.40	55.52	36.85
2004			198.0	2.45	2.20			196.1		2.20		
2005			198.0	2.35	2.35			199.0		2.35		
Total Farmer Paid Premium; Indemnity												
						Payment	1,963.73	408.29			233.58	325.02
						Frequency of Claim						25%
						Farmer Paid Loss Ratio		4.81				0.72
						Total Premium Including Subsidizes		907.31				722.28
						Industry Loss Ratio		2.16				0.32

¹MPCI-APH and GRP use different price elections. The price used to calculate the simulated GRP indemnity payment in the years prior to 1997 were assumed to be the RMA set price election for MPCI-APH.

Table 9. Marshall County Grain Sorghum GRP and GRIP Historical Simulated Indemnity Payments based on 30 Years of Trend Adjusted Yields

		RMA's 2005 Expected County Yield					KSU's 2005 Expected County Yield					150% Maximum Liability				
Year	County		Trend Adj. Expect Yield	90% Cov GRP Pymt Rate	APH ¹ Price	GRP Pymt	7.50%			90% Coverage GRIP		8.80%		90% GRIP-HRO		12.51%
	Yield	Planted Yield					GRP Prem	Plant ² Harvest Price	Pymt Rate	GRIP Pymt	GRIP ³ Prem	Pymt Rate	HRO Pymt	GRIP-HRO ³ Prem		
1980	28	25.8	55.7	48.5%	2.25	91.13	14.10	2.95	3.62	36.8%	90.91	21.72	48.5%	146.72	30.88	
1981	78	68.9	56.8	0.0%	2.40	0.00	15.33	3.56	2.63	0.3%	0.97	26.67	0.3%	0.97	37.92	
1982	70	64.1	57.8	0.0%	2.80	0.00	18.22	2.79	2.21	2.1%	5.16	21.27	2.1%	5.16	30.24	
1983	49	46.5	58.9	12.3%	2.60	28.30	17.23	2.73	3.32	0.0%	0.00	21.20	12.3%	36.11	30.14	
1984	55	53.2	60.0	1.5%	2.75	3.63	18.56	2.69	2.59	5.1%	12.40	21.34	5.1%	12.40	30.33	
1985	85	80.7	61.1	0.0%	2.60	0.00	17.86	2.50	2.26	0.0%	0.00	20.17	0.0%	0.00	28.68	
1986	92	89.9	62.1	0.0%	2.20	0.00	15.38	1.98	1.62	0.0%	0.00	16.24	0.0%	0.00	23.09	
1987	71	66.6	63.2	0.0%	1.85	0.00	13.16	1.59	1.74	0.0%	0.00	13.27	0.0%	0.00	18.86	
1988	66	64.2	64.3	0.0%	1.85	0.00	13.38	2.07	2.56	0.0%	0.00	17.54	0.0%	0.00	24.94	
1989	43	40.1	65.4	31.8%	2.40	74.71	17.65	2.57	2.26	39.9%	100.44	22.15	39.9%	100.44	31.48	
1990	82	74.3	66.4	0.0%	1.65	0.00	12.33	2.40	2.16	0.0%	0.00	21.08	0.0%	0.00	29.97	
1991	50	49.1	67.5	19.2%	2.15	41.80	16.33	2.48	2.31	24.7%	62.00	22.11	24.7%	62.00	31.43	
1992	98	91.8	68.6	0.0%	2.15	0.00	16.59	2.56	2.01	0.0%	0.00	23.18	0.0%	0.00	32.95	
1993	54	48.9	69.7	22.0%	2.10	48.27	16.46	2.27	2.60	10.5%	24.76	20.83	22.0%	59.79	29.61	
1994	97	94.0	70.7	0.0%	2.20	0.00	17.50	2.55	2.05	0.0%	0.00	23.77	0.0%	0.00	33.79	
1995	68	66.4	71.8	0.0%	2.10	0.00	16.96	2.45	3.12	0.0%	0.00	23.26	0.0%	0.00	33.06	
1996	89	86.1	72.9	0.0%	2.50	0.00	20.49	3.02	2.55	0.0%	0.00	29.00	0.0%	0.00	41.23	
1997	94	89.3	73.9	0.0%	2.30	0.00	19.13	2.66	2.62	0.0%	0.00	25.99	0.0%	0.00	36.95	
1998	103	98.1	75.0	0.0%	2.30	0.00	19.41	2.66	2.08	0.0%	0.00	26.32	0.0%	0.00	37.42	
1999	87	83.7	76.1	0.0%	2.00	0.00	17.12	2.25	1.86	0.0%	0.00	22.61	0.0%	0.00	32.14	
2000	90	85.2	77.2	0.0%	1.74	0.00	15.10	2.35	2.00	0.0%	0.00	23.90	0.0%	0.00	33.98	
2001	95	92.1	78.2	0.0%	1.52	0.00	13.38	2.33	1.95	0.0%	0.00	24.08	0.0%	0.00	34.23	
2002	48	46.9	79.3	34.3%	2.10	85.60	18.74	2.18	2.31	30.5%	79.23	22.86	34.3%	94.10	32.50	
2003	37	34.1	80.4	52.8%	2.30	146.48	20.80	2.26	2.25	53.0%	144.65	24.00	53.0%	144.65	34.12	
2004			81.5		2.00			2.80	1.91							
2005			82.5		2.30			2.15								
Total Farmer Paid Premium; Indemnity Payment							519.93	180.55			520.53	240.56		662.35	341.97	
Farmer Paid Loss Ratio								2.88				2.16			1.94	
Frequency of Claim								33%				38%			42%	
Total Premium Including Subsidizes								401.22				534.57			759.94	
Industry Loss Ratio								1.30				0.97			0.87	

¹MPCI-APH and GRP use different price elections. The price used to calculate the simulated GRP indemnity payment in the years prior to 1997 were assumed to be the RMA set price election for MPCI-APH.

²The current GRIP planting price is based on the last 5 trading days in February for new crop December CBOT corn futures contract. It has been reported that RMA plans to convert the current GRIP planting price to use the same planting price as CRC and RA. The milo price was assumed to equal 95% of the corn price. Currently this milo/corn price relationship is reset each year by RMA.

³The assumed price volatility factor of 0.21 was used to calculate GRIP and GRIP-HRO premiums. Like price elections the volatility is reset each year.

Figure 1. GRIP/GRP Kansas Corn Counties, courteous of NCIS

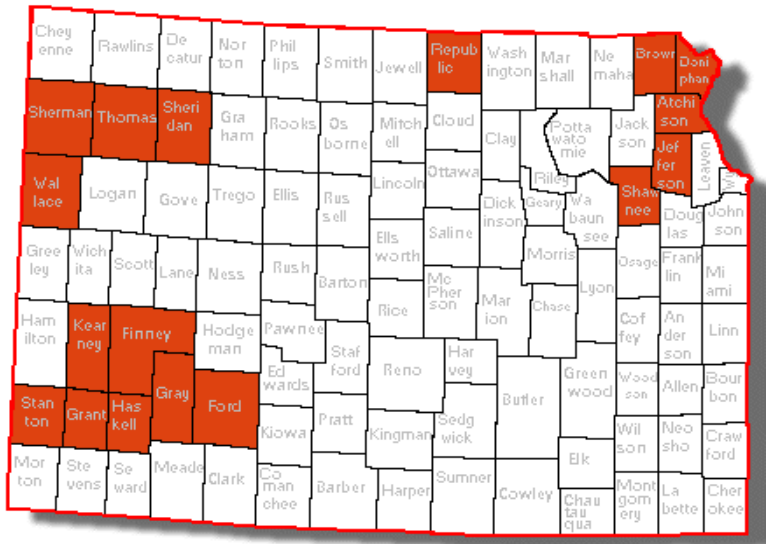


Figure 2. GRIP/GRP Kansas Grain Sorghum Counties, courteous of NCIS

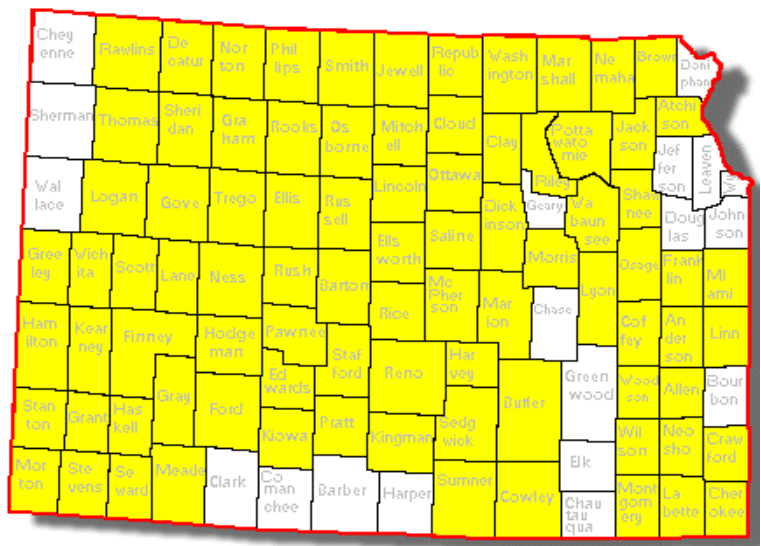


Figure 3. GRIP/GRP Kansas Soybean Counties, courtesy of NCIS

