Agricultural Marketing Policy Center

Objective Analysis for Informed Decision Making

GRP Rangeland Insurance For Wyoming

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Agricultural Marketing Policy Paper No. 8

October 2006 (Revised)

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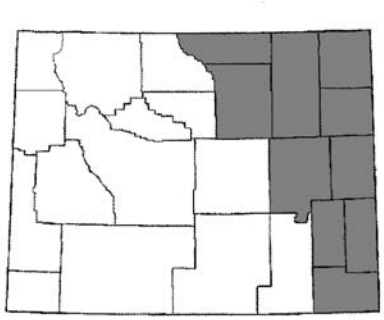
Introduction:

A new Group Risk Plan (GRP) Rangeland Insurance product is being offered by USDA's Risk Management Agency (RMA) in 10 Wyoming counties. For counties in which this insurance product is not offered, USDA's Farm Service Agency continues to offer the Noninsured Crop Disaster Assistance Program (See Briefing No. 14). The new GRP Rangeland Insurance product is intended to increase ranch managers' options for managing risk related to the loss of grazing from any of several causes.

GRP Rangeland Pilot Program:

The new GRP Rangeland Insurance product was first offered in Wyoming for the 2005 production year and continues to be offered in certain counties in 2007 (shaded counties in Figure 1).

Figure 1: GRP Rangeland Insurance Availability in Wyoming, 2006



The GRP Rangeland Insurance product provides risk protection against rangeland production losses resulting from multiple causes. An individual rancher's rangeland condition is not used for assessing losses and determining indemnities in this Group Risk Plan. Rather, an individual rancher's indemnity is determined on the basis of county-wide non-irrigated hay production which is highly correlated with rangeland conditions.

GRP Rangeland Insurance does not require rangeland to be planted to grasses, but it does require that a rancher insure all rangeland within a county in which a rancher has an interest. Only rangeland intended for harvest by grazing is eligible for this coverage. If a lease specifies the number of acres to be grazed, a rancher must insure those acres along with any owned rangeland acres. If a lease specifies the number of animal unit months (AUMs) to be grazed without specifying grazing acreage, then acres to be insured are determined by dividing the specified AUMs by a county's rangeland productivity factor (Table 1). Rangeland productivity factors are reported in RMA actuarial documents.

Basics of the GRP Rangeland Insurance Product:

GRP Rangeland Insurance uses historical and current annual production of all non-irrigated hay production in a county to determine range production losses. For each county, trigger "yields" are based on a historical net production of non-irrigated hay. Net non-irrigated hay production (also called Payment Yield) is calculated by subtracting hay harvested from CRP land and hay harvested from small grains from all non-irrigated hay production. Net non-irrigated hay production is used as a proxy for rangeland production because it is much easier to measure non-irrigated hay production than it is to determine range production directly. Moreover, the production of non-irrigated hay is highly correlated with range conditions.

GRP Rangeland Insurance is defined by the following concepts:

County Base Production: County Base Production represents the historical average annual net non-irrigated hay production in a county. The estimate is based on approximately 40 years of production data as reported by the Risk Management Agency (Table 1).

Coverage Levels: Producers may elect 70, 75, 80, 85, or 90 percent of a county's base production as their coverage level. In addition, Catastrophic Risk Protection (CAT) is available for GRP Rangeland Insurance. The CAT Coverage Level is set at the 65 percent level.

Table 1: Wyoming County Base Production, Rangeland Productivity Factors, and County Base Revenue Per Acre

County	County Base Production (tons)	Rangeland Productivity Factor (AUMs/acre)	County Base Revenue Per Acre (dollars/acre)
Campbell	44,320	0.29	$4.29
Converse	4,478	0.24	3.55
Crook	78,721	0.33	4.88
Goshen	8,442	0.28	4.14
Johnson	3,484	0.31	4.59
Laramie	12,548	0.29	4.29
Niobrara	14,256	0.27	4.00
Platte	7,494	0.27	4.00
Sheridan	22,321	0.38	5.62
Weston	24,561	0.30	4.44

Trigger "Yield": An individual ranch's Trigger "Yield" is calculated by multiplying County Base Production by a producer's selected Coverage Level.

Net Hay Production: Net Hay Production in the insured year is measured by net non-irrigated hay production in a county for that year. Net non-irrigated hay production (also called Payment Yield) is calculated by subtracting hay harvested from CRP land and small grains from all non-irrigated hay production.

County Base Revenue Per Acre: County Base Revenue Per Acre is calculated by multiplying the private grazing fee per AUM as reported by the Wyoming Agricultural Statistics Service by a county's rangeland productivity factor. The statewide rate applicable to the 2007 grazing year is $14.80 per AUM.

Maximum Protection Per Acre: Maximum Protection Per Acre is calculated by multiplying County Base Revenue Per Acre by a producer's selected Coverage Level. Note that this Coverage Level is the same as that used to calculate "Trigger Yield."

Price Election Percentage: Producers may select a Price Election Percentage between 60 and 100 percent**.** Producers generally select the 100 percent Price Election Percentage level. The Price Election Percentage is set at 45 percent for CAT coverage.

Dollar Amount of Protection Per Acre: The Dollar Amount of Protection Per Acre is calculated by multiplying Maximum Protection Per Acre by a producer's selected Price Election Percentage.

How GRP Rangeland Insurance Works: An Example

Consider a rancher with 10 sections of rangeland (6,400 acres) in a county where County Base Production equals 20,000 tons (Table 2). The applicable state-level AUM grazing fee is $14.80 per acre, and the county range productivity factor is 0.38 AUM per acre. Thus, the County Base Revenue Per Acre is $5.62 ($14.80 per acre x 0.38). If the rancher selects a Coverage Level of 90

Table 2: An Example of GRP Rangeland Insurance

Contract Data	Value	Calculation
County Base Production	20,000 tons of all non-irrigated hay	**RMA:** This value was established for and accepted by RMA.
Coverage Level	90 percent	**Producer:** The producer may choose 70, 75, 80, 85 or 90 percent of the county base production.
Trigger "Yield"	18,000 tons of all non-irrigated hay	20,000 tons x 90 percent
Actual Net Hay Production	8,000 tons of all non-irrigated hay	**NASS**
County Base Revenue Per Acre	$5.62/acre	**RMA:** ($14.80/acre) x (0.38 AUMs/acre).
Maximum Protection Per Acre	$5.06/acre	$5.62/acre x 0.90
Price Election Percentage	100 percent	**Producer:** 60 to 100 percent
Dollar Amount of Protection Per Acre	$5.06/acre	$5.06/acre x 1.00
Per Acre Indemnity	$2.81 per acre	[(18,000 tons- 8,000 tons)/ (18,000 tons)] x [$5.06/acre]
Total Indemnity	$17,984	6,400 acres x ($2.81/acre)

percent, the ranch's Trigger "Yield" will be 18,000 tons (20,000 tons x 0.90 Coverage Level). This rancher will receive an insurance indemnity if Net Hay Production in the county is less than 18,000 tons in the insured year. Furthermore, the rancher's Maximum Protection Per Acre will be $5.06 ($5.62 County Base Revenue per acre x 0.90 Coverage Level). A per acre insurance indemnity also depends upon a producer's selected Price Election Percentage. If a producer selects 100%, then the Dollar Amount of Protection Per Acre is also $5.06 ($5.06 Maximum Price Protection per acre x 1.00 Price Election).

A per acre indemnity is calculated using the following formula:

[(Trigger "Yield" - Net Hay Production) / Trigger "Yield"] x [Dollar Amount of Protection Per Acre]

If, for example, Net Hay Production is only 8,000 tons in the insured year, then the ranch would receive a gross insurance indemnity of $2.81/acre or $17,984 ([(18,000 tons - 8,000 tons)/18,000 tons] x $5.06).

GRP Rangeland Insurance Premium Calculation:

Per acre premium rates and subsidies are linked to Coverage Levels. Per acre premiums are calculated as:

Total Premium: [(Dollar Amount of Protection Per Acre) x (Premium Rate for the selected Coverage Level)].

Premium Subsidy: [(Total Premium) x (Subsidy Rate for the selected Coverage Level)].

Producer Premium: [(Total Premium) - (Premium Subsidy)].

Producer Premium: [(Total Premium) - (Premium Subsidy)].

The Producer Premium represents a rancher's out-of-pocket expenditure for the insurance. The Premium Subsidy is provided by the Federal government. Premium and subsidy rates by Coverage Level are shown in Table 3.

Table 3: Premium and Subsidy Rates by Coverage Level, for GRP Rangeland Insurance, 2006

Coverage Level (%)	Unsubsidized Premium Rate (%)	Subsidy Rate (%)	Administrative Fee ($)
70%	7.4	64	$30
75%	8.5	64	$30
80%	9.6	59	$30
85%	10.9	59	$30
90%	12.4	55	$30

CAT coverage is only available at a 65 percent Coverage Level and a 45 percent.

Price Election Percentage. CAT coverage requires a $100 administrative fee per contract – but no additional premium.

Premium rates are lower for lower Coverage Levels and subsidy rates are lower for higher Coverage Levels. In addition to per acre premium rates, a $30 administrative fee is charged for each GRP Rangeland Insurance contract. In the above example, the premium rate for the 90 percent Coverage Level selected by the rancher is 12.4 percent, and the premium subsidy for that Coverage Level is 55 percent. Per acre and ranch-level premiums for this example are shown in Table 4. This producer would have paid $1,841 (a $1,811 insurance premium plus a $30 administrative fee) to insure 6,400 acres of rangeland. In this example, the ranch would have received a gross indemnity of $17,984 (Table 2). The rancher's net indemnity (the gross indemnity less the premium and administrative fee) would have been $16,143.

Producers also have the choice of purchasing catastrophic risk protection (CAT) coverage. Rather than a per acre premium, CAT coverage a $100 administrative fee for each GRP Rangeland Insurance contract. The CAT Coverage Level is set at 65 percent and the Price Election Percentage is set at 45 percent.

Decision Criteria for Purchasing GRP Rangeland Insurance

Ranchers must decide whether or not to purchase GRP Rangeland Insurance. The preceding example illustrates a situation in which the decision to purchase insurance resulted in a positive net indemnity for a specific year. However, rangeland losses do not occur every year, and when they do occur, they vary in severity.

Table 4: Total and Producer Premiums for a GRP Rangeland Insurance Example

Contract Data	Value	Calculation
Total Premium per Acre	$0.628	**RMA:** ($5.06/acre) x (0.124 premium rate)
Total Premium for Ranch	$4,019.20	**RMA :** ($0.628/acre) x 6,400 acres
Premium Subsidy per Acre	$0.345	**RMA:** ($0.628/acre) x (0.55 subsidy rate)
Premium Subsidy for Ranch	$2,208.00	**RMA:** ($0.345/acre) x 6,400 acres
Producer Premium per Acre	$0.283	**RMA:** $0.628 - $0.345
Producer Premium for Ranch	$1,811.20	$4,019.20 - $2,208.00
Administrative Fee	$30/contract	**RMA**

The net indemnity for the example ranch is $16,143 calculated as $17,984 - $1,811 - $30.

Consider a specific Wyoming county -- Sheridan county. Over the 40-year period, 1965 through 2004, the RMA-specified County Base Production of all non-irrigated hay (excluding CRP and small grain hay) is 22,321 tons (Table 1). Appendix Table A.1 presents non-irrigated hay production in Sheridan county for the 1965-2004 period as reported by NASS. These data include both CRP and small grains hay production because separate data were not gathered for most of that period. Non-irrigated hay production averaged 24,419 tons over the 1965-2004 period. The County Base Production for Sheridan county is 91.41 percent of average non-irrigated hay production. The last column in Appendix Table A.1 presents an estimate of Net Hay Production obtained by multiplying total non-irrigated hay production by 91.41 percent. The resulting estimates approximate RMA's County Base Production values. In future years, CRP and small grains hay production data will be collected and subtracted from all non-irrigated hay production to determine Net Hay Production.

Table 5 shows Sheridan county Trigger "Yields" at CAT (65), 70, 75, 80, 85, and 90 percent Coverage Levels. The years in which estimated "Net Hay Production" fell below Trigger "Yields" for each Coverage Level are identified in Table 6.

Table 5: Trigger "Yields" for Sheridan County, WY

Coverage Level (%)	Trigger "Yields" (tons/year)
CAT (65)	14,509
70	15,625
75	16,741
80	17,857
85	18,973
90	20,089

Table 6: Years For Which Estimated Net Hay Production Was Less Than Trigger "Yields" For Each Coverage Level, Sheridan County, WY, 1965-2004

Coverage Level	Number of Years Estimated Net Hay Production Was Less Than Trigger "Yield"	Years In Which Estimated Net Hay Production Was Less Than Trigger "Yield"
CAT (65)	10	1966, 1968, 1969, 1970, 1974, 1985, 1988, 1989, 2002, 2004
70	11	1966, 1968, 1969, 1970, 1974, 1985, 1988, 1989, 2001, 2002, 2004
75	11	1966, 1968, 1969, 1970, 1974, 1985, 1988, 1989, 2001, 2002, 2004
80	13	1966, 1968, 1969, 1970, 1974, 1983, 1985, 1988, 1989, 1990, 2001, 2002, 2004
85	15	1966, 1968, 1969, 1970, 1972, 1974, 1981, 1983, 1985, 1988, 1989, 1990, 2001, 2002, 2004
90	18	1965, 1966, 1968, 1969, 1970, 1972, 1974, 1981, 1983, 1985, 1987, 1988, 1989, 1990, 2001, 2002, 2003, 2004

Suppose a rancher had the opportunity to purchase GRP Rangeland Insurance each year during the 1965-2004 period, and selected a 90 percent Coverage Level in every year. The ranch would have paid a premium in each of the 40 years[1]. The ranch would have received an indemnity in 18 of the 40 years (Table 7). In three of these years (1965, 1987, 2003) per acre indemnities were smaller than per acre premiums. The last row of Table 7 shows the per acre total premiums paid and total indemnities received over the entire 40 years. Total per acre indemnities of $28.23 exceed total per acre premiums of $10.61.

The last column of Table 8 reports net indemnity calculations for the 70, 75, 80, 85, and 90 percent Coverage Levels. The largest per acre difference between total indemnities and premiums ($17.62) would have occurred if the rancher had selected a 90 percent Coverage Level. The smallest difference ($10.00) occurs for the 70 percent Coverage Level. Note that these calculations do not include the $30 annual service fee per contract that is required for the purchase of GRP Rangeland Insurance. If this service fee were applied to 1,000 acres in the above example, it would add $0.03 per acre to the insurance premium in each year (or a total of $1.20 per acre over the 40 years).

Suppose this same rancher had selected CAT coverage in each of the 40 years. The CAT Trigger "Yield" in Sheridan county would have been 14,509 tons (Table 5). Estimated "Net Hay Production" was less than the CAT Trigger "Yield" in 10 years during the 1965-2004 period. Because CAT stipulates a 45 percent Price Election Percentage, the ranch would have received a total of $4.98 per acre for those 10 years of loss during the 40 year period. The ranch would have paid a total of $4,000 in administrative fees to purchase the coverage. If 1,000 acres of rangeland were insured in each year, the administrative fee for CAT coverage would have totaled $4.00 per acre over the 40 year period. The net indemnity would have been $0.98 per acre. Note that the per acre indemnity from CAT coverage is less that the smallest difference between indemnities and premiums for buy up levels ($10.00 per acre for the 70 percent coverage level in Table 8).

[1] It is assumed that the premium that existed in each year was equal to the 2005 level.

Important Dates for GRP Rangeland Insurance

The GRP Rangeland Insurance product has several important dates for producers.

Sales Closing Date: September 30, 2006
Acreage Reporting Date: April 15, 2007
Date Indemnity Payments Issued By: May 31, 2008

Summary

GRP Rangeland Insurance provides an opportunity for ranchers to manage downside rangeland production risks in 10 Wyoming counties. In the remaining Wyoming counties, ranchers must rely upon FSA's NAP program for rangeland risk management. GRP Rangeland Insurance bases indemnities on county-wide net non-irrigated hay production as a proxy for rangeland production. Actual range conditions on any single ranch have little influence on the probability of receiving an indemnity. In addition, the probability of receiving an indemnity (that is, experiencing range conditions which are poor enough to trigger an indemnity) varies by county.

Information on such probabilities for each Wyoming county is available by accessing the Western Risk Management Library website at http://agecon.uwyo.edu/riskmgt. The website offers county-specific data to help producers make informed decisions regarding the purchase of GRP Rangeland Insurance. After accessing the website, select "Production" at the left side of the page. Then, scroll down the alphabetical listing until reaching the link entitled "Rangeland Production Risk Management". Click on the link to access specific information on Wyoming counties.

A rancher's decision to purchase or not purchase GRP Rangeland Insurance depends upon the probability of experiencing range losses, a rancher's level of risk aversion, net worth, and cash flow situations.

References:

Johnson, James B. "Noninsured Crop Disaster Assistance Program." Briefing No. 14 (revised). Agricultural Marketing Policy Center, Department of Agricultural Economics and Economics, Montana State University, Bozeman. November, 2005.

Table 7: Per Acre Premiums and Indemnities for the 90 Percent Coverage Level, Sheridan County, WY 1965-2004

Year	Per Acre Producer Premiums (dollars)	Trigger "Yield" (tons)	Estimated Net Hay Production (tons)	Per Acre Indemnities (dollars)
1965	$0.265	20,089	19,744	$0.08
1966	0.265	20,089	10,603	2.24
1967	0.265	20,089	21,938	0.00
1968	0.265	20,089	12,706	1.75
1969	0.265	20,089	11,335	2.07
1970	0.265	20,089	12,614	1.77
1971	0.265	20,089	27,331	0.00
1972	0.265	20,089	18,830	0.30
1973	0.265	20,089	24,954	0.00
1974	0.265	20,089	13,117	1.65
1975	0.265	20,089	28,382	0.00
1976	0.265	20,089	33,181	0.00
1977	0.265	20,089	26,435	0.00
1978	0.265	20,089	33,072	0.00
1979	0.265	20,089	21,390	0.00
1980	0.265	20,089	26,508	0.00
1981	0.265	20,089	17,879	0.52
1982	0.265	20,089	29,251	0.00
1983	0.265	20,089	17,093	0.71
1984	0.265	20,089	23,583	0.00
1985	0.265	20,089	7,678	2.94
1986	0.265	20,089	20,750	0.00
1987	0.265	20,089	19,287	0.18
1988	0.265	20,089	6,490	3.22
1989	0.265	20,089	12,066	1.90
1990	0.265	20,089	17,276	0.67
1991	0.265	20,089	23,583	0.00
1992	0.265	20,089	28,794	0.00
1993	0.265	20,089	32,724	0.00
1994	0.265	20,089	22,578	0.00
1995	0.265	20,089	43,693	0.00
1996	0.265	20,089	24,315	0.00
1997	0.265	20,089	50,732	0.00
1998	0.265	20,089	28,337	0.00
1999	0.265	20,089	51,646	0.00
2000	0.265	20,089	27,442	0.00
2001	0.265	20,089	14,625	1.29
2002	0.265	20,089	7,587	2.96
2003	0.265	20,089	19,196	0.21
2004	0.265	20,089	4,113	3.78
40-Year Totals	$10.61	not applicable	not applicable	$28.23

Table 8: Per Acre Indemnities and Premiums of GRP Rangeland Insurance Over a 40-Year Period for Selected Coverage Levels

Coverage Level (%)*	Total Per Acre Indemnity Over 40 Years (dollars/acre)	Total Per Acre Premiums Over 40 Years** (dollars/acre)	Total Indemnities Less Total Premiums (dollars/acre)
70	$13.94	$3.94	$10.00
75	16.85	4.85	12.00
80	20.07	6.65	13.42
85	23.79	8.02	15.77
90	28.23	10.61	17.62

* Catastrophic risk protection (CAT) has a fixed 65 percent Coverage Level and a 45 percent Price Election Percentage.
**There is $30 administrative fee per contract per year. On an annual basis, someone who insured 1,000 acres of rangeland would incur an annual fee of $0.03 per acre on average, or $1.20 over the 40-year period.

Appendix Table A.1: Non-irrigated Hay Production and Estimated Net Hay Production, Sheridan County, Wyoming, 1965-2004

Year	All Non-irrigated Hay Production (tons)*	Estimated Net Hay Production (tons)**
1965	21,600	19,744
1966	11,600	10,603
1967	24,000	21,938
1968	13,900	12,706
1969	12,400	11,335
1970	13,800	12,614
1971	29,900	27,331
1972	20,600	18,830
1973	27,300	24,954
1974	14,350	13,117
1975	31,050	28,382
1976	36,300	33,181
1977	28,920	26,435
1978	36,180	33,072
1979	23,400	21,390
1980	29,000	26,508
1981	19,560	17,789
1982	32,000	29,251
1983	18,700	17,093
1984	25,800	23,583
1985	8,400	7,678
1986	22,700	20,750
1987	21,100	19,287
1988	7,100	6,490
1989	13,200	12,066
1990	18,900	17,276
1991	25,800	25,583
1992	31,500	28,794
1993	35,800	32,724
1994	24,700	22,578
1995	47,800	43,693
1996	26,600	24,315
1997	55,500	50,732
1998	31,000	28,337
1999	56,500	51,646
2000	30,000	27,442
2001	16,000	14,625
2002	21,000	7,587
2003	4,500	19,196
2004	24,419	4,113
Average	24,419	22,321***

*These data include hay produced from CRP acres and small grains.

** These data are calculated by multiplying all non-irrigated hay production by 91.41 percent. Although this is not the exact procedure used to develop County Base Production for GRP Insurance, it serves as a reasonable proxy for past years.

***This is the County Base Production for Sheridan County (Table 1).