



Agricultural Marketing Policy Center
Linfield Hall
P.O. Box 172920
Montana State University
Bozeman, MT 59717-2920
Tel: (406) 994-3511
Fax: (406) 994-4838
Email: ampc@montana.edu
Web site: www.ampc.montana.edu



This publication was developed with financial support from the Risk Management Agency USDA and the University of Wyoming.



Managing Forage and Rangeland Production Risks on Wyoming Ranches: NAP, LFP, and PRF-VI

James B. Johnson

Emeritus Professor
Montana State University

Vincent H. Smith

Professor
Montana State University
Director
Agricultural Marketing Policy Center

John P. Hewlett

Senior Extension Educator
University of Wyoming

Agricultural Marketing Policy Paper No. 49
July 2015

Introduction

Wyoming ranch managers are increasingly seeking production risk management tools for harvested forage production and grass production on rangeland. Forage production and rangeland production risks can be addressed to some degree by using the Noninsured Crop Disaster Assistance Program (NAP) provided by the Farm Service Agency (FSA) of the United States Department of Agriculture (USDA). Under certain drought conditions rangeland forage losses are also covered by the FSA-administered Livestock Forage Disaster Program (LFP). Also certain crop insurance products subsidized by the Federal Crop Insurance Corporation (FCIC), with oversight provided by the USDA's Risk Management Agency (RMA), can be used to address forage losses on hayland and grazing land.

The Noninsured Crop Disaster Assistance Program (NAP), as reauthorized in the 2014 Agricultural Act, is the first risk management tool examined here. NAP coverage is generally only available to ranch managers where catastrophic (CAT) levels of RMA crop insurance coverage for the subject crop are unavailable crops.

Prior to the required changes made by the 2014 Farm Bill, in some cases, NAP could be made available to certain eligible crops that had other forms of insurance (additional coverage under sections 508(c) or 508(h)) available under the Federal Crop Insurance Act. The 2014 Farm Bill amends NAP crop eligibility. As amended, NAP is not available for crops for which CAT under section 508(b) or additional coverage under sections 508(c) or 508(h) of the Federal Crop Insurance Act are available. Therefore, if either CAT or additional coverage (excluding pilot policies or plans of insurance) is available for a crop, NAP is not available..

NAP provides financial assistance to producers of noninsurable crops to protect against natural disasters that result in lower yields or crop losses or prevented planting of a crop. **Natural disasters** include damaging weather, adverse natural occurrences, and related conditions to damaging weather or an adverse natural occurrence. **Damaging weather** includes events such as drought, excessive moisture, and or a hurricane. **Adverse natural** occurrences include events such as an earthquake or a flood. **Related conditions** are events

such as excessive heat or an insect infestation associated with damaging weather or an adverse natural occurrence.

The Levels of Financial Assistance

Historically NAP has covered the amount of loss in excess of 50 percent of the ranch manager's expected production. The amount of payment has been 55 percent of average market price for the subject crop. **Expected production** is the product of a rancher's approved yield and the rancher's reported acreage. The **payment rate** is 55 percent of the average market price for the subject crop, as specified by the state FSA committee.

A major change to the NAP program established under provisions of the 2014 Agricultural Act for the crop production years 2015 through 2018 is **buy-up coverage**. NAP assistance under this coverage agreement is available for certain covered crops (all eligible NAP covered crops **other than for crops and grasses intended for grazing**). Buy-up coverage levels for eligible crops are shown (Table 1).

Table 1: NAP Buy-Up Coverage Levels

Yield Level (%)	Price Level (%)
50	100
55	100
60	100
65	100

Therefore, the buy-up coverage levels that are available range from 50 to 65 percent of production, in 5 percent increments with any loss valued at 100 percent of the FSA-specified average market price.

Eligible Crops

Any commercial agricultural crop or commodity (except livestock and livestock byproducts) grown for food or fiber for which CAT level crop insurance coverage is not available to the producer is eligible for NAP coverage. Crops grown for food, crops planted and grown for livestock consumption, and crops grown for fiber (except trees) are eligible for NAP coverage. Other eligible crops include crops grown under a controlled

environment, honey, sweet sorghum and biomass sorghum, industrial crops, value loss crops and seed crops where the propagation stock is produced for sale as seed stock for the production of eligible NAP crops.

Forage eligible for NAP coverage is vegetation consisting of annual, biennial, and perennial grasses, legumes, small grains, etc. produced in a commercial operation for animal consumption or for seed for propagation of forage for animal consumption.

Eligible Producers

An eligible producer is a landowner, tenant, or sharecropper who shares in the risk of producing a crop that qualifies as noninsurable who is entitled to an ownership share of the crop. The 2014 Agricultural Act specifies that an individual or entity's average adjusted gross income (AGI) from all sources cannot exceed \$900,000 in order to be eligible for NAP payments.

Program Eligibility Requirements

Producers must meet several USDA program requirements to be eligible for NAP assistance. Before a disaster occurs producers must: (1) certify that they comply with all highly erodible land and wetland conservation requirements; (2) report crop losses within 15 days of the earlier of the date the disaster occurs, the final planting date if planting the crop is prevented, the date the damage becomes apparent, or the normal harvest date; (3) producers must request payment under NAP coverage within 60 days of the last day of coverage for the crop year for any NAP covered crop; and (4) as with other FSA-administered programs, producers must accurately report the acreage and shares for all crops potentially eligible for NAP, certify crop production history, and report current crop year production on or before required deadlines.

Application for NAP Coverage

Eligible producers must apply for NAP coverage on noninsurable crops. All applications for coverage must be filed and all applicable service fees must be paid at the local FSA office by the pertinent application closing dates. The FSA state committee establishes the application closing dates for all crops starting in 2016 Wyoming is moving to one closing date. April 1 will be

the closing date for all crops. The closing date for honey will remain December 1.

Service fees are applicable for all NAP coverage levels. An eligible producer must pay a service fee of the lesser of \$250 per crop or \$750 per producer per administrative county, not to exceed \$1,875 for a producer with ranching interests in multiple counties.

Consider a rancher who plants hay barley to be harvested as hay on each of three different 160 acre fields in his administrative county. He also owns four sections of rangeland with native grass. He wants to use NAP coverage on his hay barley and rangeland. He pays \$250 for the hay barley and service fee of \$250 for the rangeland.

Once the rancher has paid applicable services fees for his NAP coverage, he can buy-up NAP coverage for hay barley planted to be harvested for hay. ***This rancher cannot buy-up coverage on the unit of native grass (or any other grass or crop planted for grazing) to be grazed.*** Under NAP, grazing losses on rangeland and pasture are covered only at the CAT level, the catastrophic level of grazing loss.

This rancher selects NAP buy-up coverage for 480 acres of hay barley. He selects the 60 percent buy-up coverage level on the 480 acres of hay barley that has an approved yield of 2.0 tons per acre. The following calculations estimate the premium this rancher would pay for his buy-up coverage.

NAP coverage guarantee = 1.00 producer share x 2.0 tons/acre Approved Yield x 0.60 coverage level = 1.2 tons/acre.

Per Acre NAP Liability = 1.2 tons/acre NAP coverage guarantee x 1.00 price level x \$111/ton = \$133.20/acre coverage

Total NAP Liability = \$133.20/acre coverage x 480 acres = \$63,936

Total Premium = \$63,936 Total NAP Liability x 0.0525 premium rate = \$3,357

An online NAP tool is available to assist producers in estimating NAP premiums. This tool is available at: <http://www.fsa.usda.gov/FSA/webapp?area=home&subject=diap&topic.nap>

Beginning, limited resource, and traditionally underserved ranchers are eligible for a waiver of the \$250 per crop service fee and 50 a percent premium reduction on NAP buy-up protection when they file required certification with FSA.

Determination of NAP Payments for Crop Losses

The basic procedures for the calculation of NAP payments for yield-based crops are outlined. Specific terms used in the calculation procedures are explained before presenting numerical examples.

(Eligible Acres x Producer Share x Approved Yield x Yield Coverage Level) - (Production to Count) = Net Production for Payment

(Net Production for Payment x Applicable Price x Price Percentage x Payment Factor) - (Salvage Value) = Calculated NAP Payment

The eligible acres for a crop are those acres certified by FSA personnel to be in a unit. The producer share is the share of the production the eligible producer has at risk. For instance, an owner operator has a 100 percent share. The approved yield is the average of the actual production history values based on yields from 4 to 10 years of production of the subject crop.

For NAP coverage, a **unit** will be all eligible acreage of the eligible crop in the administrative county on the date the coverage begins for the crop year in which (1) the eligible producer has a one hundred percent (100%) crop share or (2) the eligible land is owned by one person and operated by another person (eligible producer) on a crop share basis. Further division of **units** is not allowed under NAP provisions. Clarification is provided. If an eligible producer owns a field in a subject crop, then he has a 100 percent interest. If an eligible producer cash leases a field with the same subject crop he also has a 100 percent interest. These two fields constitute one unit. If the producer plants

the subject crop in a third field with a 50/50 crop share lease, then he has a second unit.

Under NAP, the FSA allows producers to establish an expected level of production by unit to reflect normal production capabilities. The eligible producer's actual history of producing the crop is used to determine the extent of the loss in the disaster year. FSA calculates an **approved yield** for a crop by averaging a producer's actual production history (APH) for a minimum of four crop years to a maximum of ten crop years. If an eligible producer is a new producer of the crop to be covered by NAP or if a producer does not report production of the crop for which NAP coverage is being sought, four years of acceptable production records may not be available. For such crops the FSA uses a defined set of procedures to incorporate **transition yields (T-Yield)** to determine average yield. For instance, if there are yields reported for three years, the fourth observation for determining the average is 100 percent of the applicable T-yield. A T-yield for a subject crop is an expected yield based on the yield history for the crop in the county.

The yield coverage level is the proportion of the approved yield that the eligible producer selects for determining yield losses eligible for compensation for NAP. If the eligible producer selects CAT coverage, he would be eligible for financial compensation if the yield realized for the current crop year is less than 50 percent of the approved yield, and other applicable conditions are met. Likewise the buy-up yields of 50, 55, 60, and 65 percent have similar interpretations. If an eligible producer bought 65 percent yield coverage and then achieved a realized yield of less than 65 percent of the approved yield, NAP financial compensation would be forthcoming if all other applicable conditions were met.

Production to Count is all harvested, appraised, and assigned production for a unit. In some instances the FSA employs the term **Net Production** and **Production Count** interchangeably. **Production to Count** is the composite of production that was taken or could have been taken from the unit. Appraised production, as determined by FSA personnel or an approved appraiser, is production that was not harvested but which reflected the crop's yield potential at the time of appraisal. Assigned production is the loss of production

Payment. The **applicable price** for the crop is the price approved by the FSA state committee. Guidance is provided by the FSA national office when valuing crops such as grazing on rangeland. The price (coverage) percentage for CAT level coverage is set at 55 percent of the applicable price. For buy-up levels of yield coverage the price election is 100 percent of the applicable price. To reflect a decrease in production costs incurred, payment rates are reduced by **payment factors** for crops that are not harvested. Payment factors are specified by FSA. **Net Production for Payment** can also be reduced due to the damaged crop having a **salvage value**. **Salvage value** is the dollar amount an eligible producer receives when the crop is sold in a market at a price less than the FSA specified price. The loss in quality resulting in a crop becoming salvage must be because of a natural disaster. These valuation calculations are conducted to arrive at the **Calculated NAP Payment**.

Consider NAP payments for hay barley enrolled at different coverage levels.

One rancher uses NAP at the CAT level. A neighboring rancher chooses buy-up NAP coverage at the 60 percent of the approved yield level. A wide spread hail storm goes through their area and greatly reduces the amount of hay barley that can be harvested from their fields. These producers usually get around 2 tons of hay per acre but will likely on harvest about 0.6 tons per acre this crop year.

The rancher covering the uninsurable hay barley crop with NAP at the CAT level would receive a NAP payment of \$4,884.

Variable	Value of Variable	Calculation
Crop	uninsurable hay barley	-----
Eligible Acres	200 acres	200 acres
Producer Share	100 percent, 1.00	X 1.00
Approved Yield	2.0 tons/acre	X 2.0tons/acre
Yield Coverage	50 percent, 0.50	X 0.50
		= 200 tons
Production to Count	0.6 tons/acre x 200 acres	- 120 tons
Net Production for Payment		= 80 tons
Applicable Price	\$111.00/ton	X \$111.00/ton
Price Percentage	55 percent, 0.55	X 0.55
Payment Factor	harvested, 1.00	X 1.00
Salvage Value	no adjustment	- 0.00
Calculated NAP Payment		= \$4,884

The neighboring rancher across the road produces the same uninsurable hay barley crop but decides that he will buy-up his NAP yield coverage to 60 percent.

The two ranches each lost 280 tons of hay barley due to the hail storm that went through their production area. The first neighbor paid the FSA a \$250 service fee to have NAP coverage on 200 acres of hay barley at the CAT level and received \$4,884 in financial assistance. The other neighbor paid the FSA a service fee of \$250 to cover his 200 acres of hay barley and also paid a premium to FSA of \$1,119 for the buy-up to 60 percent yield coverage. This rancher received total financial assistance of \$13,220. As both ranchers paid the service fee, the second rancher received an additional \$8,836 (\$13,320 - \$4,884) of financial assistance for the \$1,119 premium he paid. In this example, the net gain realized by the second rancher from buying up his NAP coverage to 60 percent was \$7,717, (\$8,836 - \$1,119).

Other ranchers may choose to use NAP to address production risks associated with small grain hay or grass hay intended for mechanical harvest as hay. Ranchers can use the two illustrations for hay barley to develop an initial estimate of their financial payment if they suffer a loss in hay production for crops covered by NAP. They may also use the format outlined in the illustrations to guide them with respect to the advisability of using buy-up NAP coverage.

Ranchers will also have an interest in using NAP to cover losses arising from diminished grazing on their rangeland due some natural disaster.

Normal grazing available and grazing losses are measured in **Animal Unit Days**. There is only CAT level NAP coverage for grazing losses so production losses in excess of 50 percent of normal production are paid at 55 percent of the applicable price. Grazing losses are valued by the **Animal Unit Day Value** set annually by FSA at the national level.

For purposes of NAP, an **animal unit (AU)** is a standard expression of livestock based on a daily net energy maintenance requirement equal to 13.6 Megacalories. Alternatively this is the provision of 16 pounds of TDN per day. The standard conversion table used by FSA lists a beef cow or bull as equivalent to 1 **animal unit**. (Refer to Appendix Table 1, Animal Unit Conversions, for other livestock). An **animal unit day (AUD)** is an expression of the expected or actual stocking rate for pasture or forage. The **animal unit day value (AUD value)** is the dollar value of the daily energy requirement equivalent to 15.7 pounds of corn determined on the basis of the 5-year national average price per pound of corn.

Variable	Value of Variable	Calculation
Crop	uninsurable hay barley	-----
Eligible Acres	200 acres	200acres
Producer Share	100 percent, 1.00	X 1.00
Approved Yield	2.0 tons/acre	X 2.0tons/acre
Yield Coverage	0 percent, 0.60	X 0.60
		= 240 tons
Production to Count	0.6 tons/acre x 200 acres	- 120 tons
Net Production for Payment		= 120 tons
Applicable Price	\$111.00/ton	X \$111.00/ton
Price Percentage	100 percent, 1.00	X 1.00
Payment Factor	harvested, 1.00	X 1.00
Salvage Value	no adjustment	- 0.00
Calculated NAP Payment		= \$13,320

The procedure for calculating the NAP payments for rangeland is as follows:

Total Animal Unit Days = [(Eligible Acres of Rangeland)/ (Normal Carrying Capacity, measured in acres per animal unit)] x [Days in Grazing Period]

Animal Unit Days Eligible for Payment = [(Appraised Percent of AUD Loss) - (50 Percent of AUD)] x [Total Animal Unit Days]

Calculated NAP Payment = [Animal Unit Days Eligible for Payment] x [(Animal Unit Day value x (55 percent))]

Eligible acres of rangeland or pasture are the acres certified as such by FSA personnel. **Normal carrying capacity** is specified by grazing type and species as to the number of acres that would be required to support an animal unit for the grazing season. **Grazing season length** is defined by the state FSA committee by designating the beginning and ending dates for the grazing season.

For forage losses on rangeland and pasture, FSA personnel or FSA-approved appraisers determine the level of grazing loss due to a natural disaster. For payment purposes the losses are expressed in percent of AUDs lost for each unit. For 2015 the **AUD value** is specified as \$1.4130 per AUD.

Suppose that the two ranchers who considered NAP for their hay barley production also have rangeland with native grass. Their rangeland forage can be covered by NAP because there is no crop insurance at the CAT level available for rangeland in Wyoming. Forage production intended for grazing can only be covered at the CAT level under NAP.

Uses of NAP in Wyoming

Under the current mix of crop insurance offerings available to address grazing and harvested forage losses in Wyoming, the likely uses of NAP by ranchers are for small grains planted for hay, grass and grass mixtures harvested for hay, and forage on rangeland and pasture that is grazed.

Variable	Value of Variable	Calculation
Crop	native grass	-----
Eligible Acres	2,560 acres	2,560 acres
Normal Carrying Capacity	20 acres/AUM	/ 20acres
Animal Units		= 128 AU
Grazing Period	195 days	X 195 days
Animal Unit Days		= 24,960 AUD
[Percent Loss in AUD] - [50 Percent of AUD]	70 percent - 50percent = 20 percent, 0.20	X 0.20
Animal Unit Days for Payment		= 4,992 AUD
Animal Unit Day Rate	\$1.4130	X \$1.4130
Price Percentage	55 percent, 0.55	X 0.55
Calculated NAP Payment		= \$3,880

In each Wyoming FSA county office tables are available electronically that provide all pertinent information for each small grain that may be produced and mechanically harvested as hay, for grasses to be produced and mechanically harvested as hay, and for native and improved pasture (and rangeland) grasses produced to be grazed. The information in Tables 2, 3 and 4 illustrates some of the key data needed for NAP application and participation. Information included in these tables is abbreviated compared to the electronic tables available in the FSA county offices.

The two grasses listed in Fremont County for harvest as forage are native grass, one under an irrigated practice and one that is non-irrigated (Table 2). The estimated yields for purposes of possible NAP financial assistance are 1.77 tons per acre when irrigated and 0.87 tons per acre without irrigation. The NAP price for grass hay in 2015 is \$131 per ton. The **unharvested payment factor** of 0.800 is applied when no grass hay is harvested. This factor is applied when no hay is harvested to reduce the NAP payment to 80 percent of what was calculated to reflect the cost savings to the eligible producer because harvest costs were not incurred.

NAP coverage for biennial and perennial forage crops begins the later of: (a) 30 days after the application closing date; or (b) the date following the normal harvest date of the previous crop year. Coverage ends the earlier of: (a) the normal harvest date; or (b) the date the commodity is abandoned or destroyed. For grazed forage, the coverage period ends the earlier of: (a) end of the designated grazing period established by the FSA state committee; or (2) the date the crop is abandoned or destroyed.

Information available for wheat to be harvested as hay is presented (Table 3). The data entries for wheat and other small grains to be harvested as hay take on the same interpretations in calculations as do entries for grasses harvested as hay.

For annual crops NAP coverage begins the latter of: (a) 30 days after FSA accepts an eligible producer's application and the service fees have been paid; or (b) the date the crop is planted not to exceed the final planting date for the subject crop. Coverage ends at the earliest of: (a) the date the harvest is complete; (b) the normal harvest date for the production area; (c) abandonment of the crop; or (d) the total destruction of the crop.

Table 2: Information Needed for NAP on Grasses Produced for Harvest as Hay in Fremont County

Crop Type	Intended Use	Unharvested Payment Factor	Practice	Unit of Measure	NAP Market Price	County Estimated Yield
NAG*	FG**	0.800	I	TON	\$131	1.77
NAG*	FG**	0.800	N	TON	\$131	0.87

*NAG is the abbreviation for native grass.

**FG is the abbreviation for forage grazed.

Table 3: Information Needed for NAP on Wheat Harvested as Hay in Fremont County

Crop Type	Intended Use	Unharvested Payment Factor	Practice	Unit of Measure	NAP Market Price	County Estimated Yield
HRS	FG	0.830	I	TON	\$131	1.77

*HRS is the abbreviation for hard red spring wheat. Other small grains that are sometimes covered for harvest as hay under NAP are barley and oats, and sometimes rye and triticale.

The two general pasture types considered for NAP coverage in Wyoming are *native pasture* and *improved pasture*. However different species of grass are considered for NAP purposes, especially for improved grasses. There are large differences in the acres required per animal unit of forage depending on the production practice, that is, whether or not the grass was produced under irrigation such as an irrigated pasture or the non-irrigated rangeland used by most Wyoming ranchers (Table 4).

The Use of NAP by a Fremont County Ranch

A long-time rancher in Fremont County has a 360 cow operation which he runs with 18 range bulls and 54 unbred replacement heifers on the range. He also keeps 6 saddle horses on the rangeland in the summer. He has 600 acres of irrigated native grass hay and 15,000 acres on rangeland with native grass.

The water sources for his native grass hay production are in part from a small reservoir and in part from some early season stream diversion. He has improved his water distribution on his privately-owned rangeland as he purchased additional parcels. Because of a general drought prevailing in Fremont County over the past decade he suffered substantial losses in hay and range production in 2006, 2012, and 2014. So it was no surprise if Fremont County suffered a drought that began in mid-July and continued until late September in the 2015 crop year.

With the drought history that the rancher had experienced over the last few years, he took advantage of the new opportunity of the buy-up coverage

available for his irrigated grass hay. He also continued to use NAP coverage on his native grass range, especially as he only incurs the \$250 service fee to carry NAP coverage. He has operated this ranch for nearly 40 years and has filed annual crop acreage and yield reports with the county FSA office for years. So he has an approved yield of 2.0 tons per acre on his irrigated native grass hay covered by one unit. He chooses a buy-up level of 65 percent on the 2.0 tons per acre approved yield.

He harvests a partial crop of grass hay from the 600 acres of irrigated grass hay. This hay was hauled to the stack yard where the bales were counted and a photo of the stack yard was taken. When the FSA-approved appraiser came to assess the loss in grass production on the range, the rancher and appraiser hauled one bale to a certified scale to determine the bale weight. With the bale count and weight, the appraised hay harvest was established at 480 tons.

So this producer spent \$250 for the FSA service fee to cover the rangeland grass with NAP CAT-level coverage and also \$250 service fee for the irrigated native grass hay. But as he has chosen the 65 percent coverage buy-up level of NAP coverage for his grass hay, he pays an additional premium. That premium is computed as follows:

$$\text{NAP coverage guarantee} = 1.00 \text{ producer share} \times 2.0 \text{ tons/acre Approved Yield} \times 0.65 \text{ coverage level} = 1.3 \text{ tons/acre}$$

Table 4: Information Needed for NAP on Grasses intend for Grazing in Fremont County

Crop Type	Intended Use	Planting Period	Practice	Unit of Measure	Acres per Animal Unit	Grazing Days**	AUD Value (\$)
NAG*	GZ*	01	I	AUD	4.4	198	1.4130
NAG*	GZ*	21	I	AUD	12.0	198	1.4130
NAG*	GZ*	01	N	AUD	35.4	198	1.4130
NAG*	GZ*	21	N	AUD	47.1	198	1.4130

*NAG is the abbreviation for native grass and GZ is for the abbreviation for grazing.
 **For all grasses with an intended use of grazing in all Wyoming counties the grazing period begins April 1 and ends October 15, 198 days.

Per Acre NAP Liability = 1.3 tons/acre NAP coverage guarantee x 1.00 price level x \$111.00/ton = \$144.30

Total NAP Liability = \$144.30/acre coverage x 600 acres = \$ 86,580

Total Premium = \$86,580 Total NAP Liability x 0.0525 premium rate = \$4,545

The rancher paid \$500 in service fees at the time he signed up for NAP to cover both his grass hay production and his rangeland forage production. FSA will invoice him for the \$4,545 premium payment. In total the rancher will pay \$5,045 for his NAP coverage (\$500 in service fees + \$4,545 in premiums).

A drought was evident by mid-July and persisted throughout much of the remainder of the growing season. The rancher's hay production and his forage production on range were adversely impacted. The rancher wanted an estimate of the NAP financial assistance he would receive.

As he was going to have to buy hay he started by assessing his losses and possible compensation for his partial hay crop.

These initial calculations indicated that the rancher would have received financial assistance from NAP of \$ 39,300 for the loss in hay production due to drought. This assistance would give him a start on purchasing hay to meet his needs for the upcoming feeding season.

The FSA-approved appraiser determined that there was a 60 percent loss in forage production on the rancher's 15,000 acres of rangeland, something that the rancher was aware of because he had contracted some rangeland in an adjoining state for his cow herd. His compensation under NAP, due to the 50 percent yield "deductible" and the valuation of his rangeland forage losses at 55 percent of the applicable price, was estimated to be only \$ 6,524 But he only paid the \$250 service fee for this CAT-level coverage.

Variable	Value of Variable	Calculation
Crop	irrigated native grass hay	-----
Eligible Acres	600 acres	600acres
Producer Share	100 percent, 1.00	X 1.00
Approved Yield	2.0 tons/acre	X 2.0tons/acre
Yield Coverage	65 percent, 0.65	X 0.65
		= 780 tons
Production to Count	0.8 tons/acre x 600 acres	- 480 tons
Net Production for Payment		= 300 tons
Applicable Price	\$131.00/ton	X \$131.00/ton
Price Percentage	100 percent, 1.00	X 1.00
Payment Factor	harvested, 1.00	X 1.00
Salvage Value	no adjustment	- 0.00
Calculated NAP Payment		= \$ 39,300

So in total, the rancher expects to receive just over \$46,000 in NAP financial assistance from an expenditure of \$5,045 for service fees and premium charges.

Multiple Benefits: The usual prevailing statement when there is the potential for receiving multiple benefits from the same loss is---***if a producer is eligible to receive payments under this part and benefits under any other program administered by the Secretary (of Agriculture) for the same crop loss, the producer must choose whether to receive the other program benefits or payments under this part (under NAP), but will not be eligible for both. The limitation on multiple benefits prohibits a producer from being compensated more than once on the same loss.***

This **limitation on multiple benefits** specified above **does not apply** to the following programs:

- (1) ***Livestock Forage Disaster Program (LFP)*** or
- (2) ***Emergency Assistance for Livestock, Honeybees and Farm-Raised Fish Program (ELAP)***.

A few other FSA programs are also exempt from the multiple benefits restriction, but these two standing disaster programs, especially LFP, are extremely important to ranchers in covering losses from certain natural disasters.

The Livestock Forage Disaster Program: LFP provides compensation to eligible livestock producers who have suffered **grazing losses** because of a qualifying **drought** or **fire**. Drought losses eligible for compensation must have occurred because of a qualifying drought during the normal grazing period for the county on land that is native or improved pastureland with permanent vegetative cover or land specifically planted with a crop for grazing livestock¹.

For grazing losses, a general signup period and ending date are **not** applicable for LFP. The county FSA office will announce that producers in the county may make application for LFP in the county because a qualifying drought has occurred. If there is a qualifying drought in any area of a county, then the entire county is eligible for LFP.

The **Livestock Payment Rate** for losses because of qualifying drought is calculated as **60 percent** of the smaller of the following two alternative measures of the cost of lost feed:

- (1) The monthly payment rate (for a particular kind, type, and weight of livestock, presented in Appendix Table 2) is multiplied by the number of head of eligible livestock. This calculation is made for all eligible kinds, types and weights of livestock and the products of these calculations are then summed.

Variable	Value of Variable	Calculation
Crop	native grass	-----
Eligible Acres	15,000 acres	15,000 acres
Normal Carrying Capacity	35.4 acres/AUM	/ 35.4acres
Animal Units		= 424 AU
Grazing Period	198 days	X 198 days
Animal Unit Days		= 83,952 AUD
(Percent Loss in AUD) - (50 Percent of AUD)	60 percent - 50 percent = 10 percent, 0.10	X 0.10
Animal Unit Days for Payment		= 8,395 AUD
Animal Unit Day Rate	\$1.4130	X \$1.4130
Price Percentage	55 percent, 0.55	X 0.55
Calculated NAP Payment		= \$ 6,524

¹ Details of the eligible grazing types, eligible lands, eligible livestock and eligible livestock producers are presented in AMPC Policy Paper No. 43, July 2014. Also the application of LFP to Federal rangeland damaged by fire is discussed in that policy paper.

(2) The number of acres of grazing land or pastureland of a specific type of grazing land is divided by the normal carrying capacity, in acres, per animal unit. The monthly payment rate for an animal unit (beef cow) is divided by 30 to establish the daily feed cost. The potential payment is then: $(0.60) \times [(30 \text{ days} \times \$ \text{ daily feed cost}) \times (\text{animal units})]$.

through September 28, 2015. Under the D2 drought level the rancher was only entitled to one month of compensation for forage losses on the rangeland.

Applying these calculations to the Fremont County ranch, the LFP potential payment is the lesser of the following:

A D2 drought had been declared in Fremont County. The drought that began on July 15 and persisted

(1)

Livestock	2015 LFP Monthly Rate (\$)	Number of Head	Total (\$)
360 Cows	40.79	360	14,684
18 Bulls	40.79	18	734
54 Heifers > 500 pounds	30.59	54	1,652
6 Saddle Horses	30.18	6	181
LFP Potential Monthly Payment	-----	-----	17,251 X 0.60 = 10,351
Number of Months of Payment based on Drought Severity D2)	-----	-----	1
Total Potential LFP Payment	XXXXXXXX	XXXXXXXX	\$10,351 X 1 = \$10,351

or

(2)

Item	Value	Calculation
Acres of Grazing	15,000	-----
Acres per Animal Unit (AU)	35.4	-----
AUs of Grazing	424	15,000 / 35.4
Animal Unit Days/Month (AUD)	12,720	424 X 30
LFP Feed Cost per AU	\$40.79	-----
Daily Feed Cost	\$1.3597	\$40.79/30
Total Feed Cost	\$17,295	\$12,720 x \$1.3597
LFP Monthly Potential Payment	\$10,377	\$17,295 X 0.60
Number of Monthly Payments based on Drought Severity (D2)	1	-----
Total LFP Potential Payment	\$10,377	1 X \$10,377

The Fremont County ranch would obtain financial assistance in the amount of \$10,351 through the Livestock Forage Program for the loss of grazing on the 15,000 acres of rangeland in native grass.

PRF-VI Crop Insurance: Several crop insurance products are available under pilot programs. Producers may obtain NAP coverage and pilot plan insurance coverage. In most instances, any crop insurance indemnity is subject to the multiple benefits exclusion.

However, there is an important exception. A producer may participate in NAP and also participate in the pilot **Pasture, Rangeland, and Forage Vegetation Index (PRF-VI)** insurance program. The producer is then allowed receive both financial assistance from NAP and an insurance indemnity from PRF-VI on the same forage loss.

Starting with the 2016 production year ranchers and other producers will continue to be permitted to obtain NAP coverage and PRF coverage, but must elect to receive either a NAP payment or PRF indemnity for a covered loss, but not both for the same loss.

In Wyoming, many ranchers use a PRF-VI policy to address forage production risks, both for forage that is mechanically harvested and forage that is grazed. The PRF-VI is an insurance policy that allows ranchers to obtain indemnities when widespread reductions in pasture and forage production occur in designated areas called **grids**, each consisting of about a 4.8 mile by 4.8 mile area. The insurance program is primarily intended for the use by ranchers whose forage production tends to follow the average growth patterns of the grid in which at least some of the rancher's contiguous hayland or grazing land is located.

A vegetation index called the **Normalized Difference Vegetation Index (NDVI)** serves as the indicator variable for pasture, range, and forage production. The index is calculated using satellite data on plant greenness available from the U.S. Geological Survey.

Operationally, a rancher selects a "**point of reference**" identified by longitude and latitude that represents the location of the forage acreage the rancher wants to insure. This reference point determines the **GRID ID** for

the grid whose NDVI value forms the basis for the insurance.

The crops to which PRF-VI is applicable are defined as pasture, rangeland or forage. Two crop types are identified: **grazingland** and **hayland**.

The PRF-VI program can be used to insure against reductions in grazingland or forage production. If the NDVI is sufficiently low relative to its average (or normal) value, then a rancher will receive an indemnity.

Historical data on the values of the NDVI are available to ranchers and their insurance agents for each three month period or quarter from 1989 to the current year. These three month periods are called **index intervals**. In any given location or grid, the intervals available to a rancher for grazingland or hayland may be limited by the Risk Management Agency because of vegetation growth patterns. In Wyoming the index intervals offered for hayland and grazingland are identical and currently consist of the following three month intervals:

- April through June
- May through July
- June through August
- July through September
- August through October

A rancher can choose to insure hayland or grazingland and in one or more of the index intervals. At least 10 percent of the eligible acres in any forage type to be insured must be in the interval. Furthermore, the selected intervals cannot overlap; that is, no month can be included in more than one interval in each PRF-VI insurance contract.

Insurance is based on the **county base value** for the crop, which is determined by RMA, and the **coverage level** and **production factor** selected by the rancher. The coverage value is the percentage of the county base value selected by a producer for insurance coverage. A rancher can choose a coverage level of 70, 75, 80, 85, or 90 percent of the county base value for the crop to be covered. The production factor is a value between 60 and 150 percent that a rancher selects to reflect his operation's forage productivity. Ranchers may select coverage levels and production factors so that the product of these two variables multiplied by the county

base value approximates the production value of the acreage they are insuring.

The **dollar amount of protection per acre** is equal to the **county base value per acre** for the crop type times the **coverage level** times the **production factor**. The dollar amount of protection per acre for each crop type is the same for all insured acres. The **policy protection per unit** equals the **dollar value of protection per acre** multiplied by the **acres insured** in a unit.

The PRF-VI policy uses the NDVI Index at the grid level to determine indemnity payments. The expected grid index is determined by the Federal Crop Insurance Corporation (FDIC) based on the mean (average) accumulated NDVI values by index interval calculated using the NDVI gridded data, normalized and expressed as a percentage. The **expected value for a grid** is always given a value of 100, representing 100 percent of the expected value of the forage. The **final index value** is determined by FDIC based on current NDVI values of each grid ID and index value during a crop year. A final index value of greater than 100 indicates the NDVI value for the grid is above average. A final index value of less than 100 indicates that the NDVI value is a below average value.

Insurance indemnities are paid to ranchers when the NDVI **final grid index** falls below the **trigger grid index**

established by the rancher. The **trigger grid index = expected grid index x coverage level**. A unit’s indemnity is defined as: **Indemnity per unit = Policy protection per unit x payment calculation factor**.

The **payment calculation factor = (trigger grid index – final grid index) / [(trigger grid index) – (expected grid index x total loss factor²)]**. Unless otherwise specified the total loss factor is 0.30.

The use of PRF-VI is illustrated by covering both the 600 acres of hayland and the 15,000 acres of grazing land on the example ranch in Fremont County. The hayland is in the valley and the grazingland is several miles away in the foothills. Two separate grids are involved. All of the hayland will covered in one grid and all of the grazing land in another.

Consider first the possible indemnification for a loss due to drought in hay production covered under PRF-VI.

So with a final grid value of 40 percent, the rancher would be indemnified for the loss of hay production in the amount of \$168,092.

Although the Fremont County rancher's rangeland was in another grid, it also had a final grid value Of 40 percent, so an indemnity under PRF-VI was forthcoming.

Item	Value	Value Specification or Calculation
County Base Value	\$373.58	Specified in the insurance coverage
Coverage Level	0.90	Selected by rancher, 70,75,80,85 or 90 %
Production Factor	1.00	Selected by rancher, 60 to 150%
Dollar Protection per Acre	\$336.22	(\$373.58 X 0.90 X 1.00)
Acres in Unit	600	Acres in unit to be insured
Dollar Protection per Unit	\$201,732	(\$336.22 x 600)
Expected Grid Index Value	100, or 100%	Specified in insurance, always 100 or 100%
Final Grid Index Value	40, or 40%	Determined by calculation after close of insured interval
Trigger Grid Index Value	90	(expected grid value x coverage level); 100 x 0.90.
Payment Calculation Factor	0.833	(trigger grid index value - final grid index value)/[(trigger grid index value) - (expected grid index value X 0.30)]; (90- 40)/ [(90)- (100 X 0.30)]= 0.833
Indemnification per Unit	\$168,092	\$201,792 x 0.833

² The total loss factor is a factor used in the payment calculation to establish the level of loss at which the total indemnity amount for the unit is payable. This is the level at which the vegetation generally has zero production. The factor will be set at 0.30 unless otherwise specified in the specific provisions of the policy. With a factor of 0.30, the policy will pay out the total indemnity when the grid index is less than or equal to 30 percent of the expected grid index. The total indemnity will never be more than 100 percent of the policy protection for the unit. **In other words, any total loss factor calculation greater than 1.00 will be truncated at 1.00.**

Item	Value	Value Specification or Calculation
County Base Value	\$8.70	Specified in the insurance coverage
Coverage Level	0.90	Selected by rancher, 70,75,80,85 or 90%
Production Factor	1.00	Selected by rancher, 60 to 150%
Dollar Protection per Acre	\$7.83	(\$8.70 X 0.90 X 1.00)
Acres in Unit	15,000	Acres in unit to be insured
Dollar Protection per Unit	\$117,450	
Expected Grid Index Value	100, or 100%	Specified in insurance coverage, always 100 or 100%
Final Grid Index Value	40, or 40%	Determined by calculation after close of insured interval
Trigger Grid Index Value	90	(expected grid value x coverage level); 100 x 0.90.
Payment Calculation Factor	0.833	(trigger grid index value - final grid index value)/[(trigger grid index value) - (expected grid index value X 0.30)]; (90- 40)/ [(90)- (100 X 0.30)]= 0.833
Indemnification per Unit	\$97,836	\$117,450 x 0.833

Coverage Level	0.70	0.75	0.80	0.85	0.90
Production Factor	1.00	1.00	1.00	1.00	1.00
Premium Rate	0.0103	0.0178	0.0306	0.0498	0.0760
County Base Value	\$373.58	\$373.58	\$373.58	\$373.58	\$373.58
Total Premium/Acre	\$2.69	\$4.99	\$9.15	\$15.81	\$25.55
Premium Subsidy Rate	0.59	0.59	0.55	0.55	0.51
Producer Premium/Acre	\$1.10	\$2.04	\$4.12	\$7.12	\$12.52
Insured Acres	600	600	600	600	600
Total Producer Premium	\$662.60	\$1,226.87	\$2,469.21	\$4,269.68	\$7,512.54
Subsidy/Acre	\$1.59	\$2.95	\$5.03	\$8.69	\$13.04
Total Subsidy	\$953.50	\$1,765.50	\$3,017.93	\$5,218.50	\$7,819.18
Total Premium	\$1,616.10	\$2,992.37	\$5,487.14	\$9,488.18	\$15,331.72

Premium calculations for PRF-VI are similar to those of other group risk insurance products. Illustrated above are the premium calculations at various coverage levels for the hayland on the Fremont County ranch, as calculated by the online RMA premium cost estimator. The hayland is located in Grid #59854.

Illustrated below are the premium calculations at various coverage levels for the grazingland on the Fremont County ranch, as calculated by the online RMA premium cost estimator. The grazingland is located in Grid #59280.

The **producer premium per unit = Total premium per unit – producer subsidy per unit**, where the **total premium per unit = dollar protection per acre x insured acres in unit x total premium rate per acre**

Coverage Level	0.70	0.75	0.80	0.85	0.90
Production Factor	1.00	1.00	1.00	1.00	1.00
Premium Rate	0.0073	0.0131	0.0221	0.0359	0.0566
County Base Value	\$8.72	\$8.72	\$8.72	\$8.72	\$8.72
Total Premium/Acre	\$0.045	\$0.086	\$0.154	\$0.266	\$0.444
Premium Subsidy Rate	0.59	0.59	0.55	0.55	0.51
Producer Premium/Acre	\$0.019	\$0.035	\$0.069	\$0.120	\$0.217
Insured Acres	15,000	15,000	15,000	15,000	15,000
Total Producer Premium	\$274.00	\$527.00	\$1,041.00	\$1,795.00	\$3,266.00
Subsidy/Acre	\$0.026	\$0.051	\$0.085	\$0.146	\$0.227
Total Subsidy	\$394.00	\$758.00	\$1,273.00	\$2,195.00	\$3,399.00
Total Premium	\$668.00	\$1,285.00	\$2,314.00	\$3,990.00	\$6,665.00

Of most interest to ranchers are the producer premium calculations that are presented in bold type in the previous calculations. Ranch managers will note that the actuarially sound premiums are the total premiums.

The Use of Production Risk Management Programs by the Fremont County Rancher: The Fremont County rancher made efficient use of NAP, LFP and PRF-VI. He applied NAP to his grass hay at a buy-up level and continued to use NAP on his rangeland at the CAT level. As a D2 drought was declared in Fremont County he received financial assistance for grazing losses under LFP. He has made continued use of PRF-VI for both his grass hay and grazingland and received indemnities under his insurance coverage for each (Table 5).

Table 5: Financial Assistance and Crop Insurance Indemnities for the Fremont County Ranch

Program	Grass Hay (\$)	Grazing (\$)	Total by Program (\$)
NAP	39,300	6,524	45,834
LFP	0	10,351	10,351
PRF-VI	168,092	97,836	265,928
Total Rancher Compensation	207,392	114,711	322,103

The costs the rancher incurred in managing the productions risks associated with grass hay production

and grazing on rangeland were minimal compared to the benefits realized (Table 6).

Table 6: Service Fees and Crop Insurance Premiums Incurred in Managing Production Risk on the Fremont County Ranch

Program	Grass Hay (\$)	Grazing (\$)	Total by Program (\$)
NAP	250.00 + 4,545.00	250.00	5,045.00
LFP	0	.0	..0
PRF-VI	30.00 + 7,512.54	30.00 + 3,266.00	10,838.54
Total Rancher Cost	12,337.54	3,546.00	15,883.54

Summary

Wyoming ranchers are continuously faced with production risks related to their harvested feed bases and their grass production on rangeland. There are several federally-provided programs available to address these risks through programs offered by the United States Department of Agriculture.

NAP covers production risks associated with grass production on rangeland and pasture. It has a 50 percent deductible and provides compensation at 55 percent of the payment rate for losses in grazing. Often the NAP compensation is not large, but the cost is minimal for rangeland, only a \$250.00 fee paid to FSA. Certain types of hay production, especially grass hay and small grains planted for hay, can also be covered under NAP. There are now buy-up levels of NAP that can be obtained through the payment of a premium to address losses of hay production.

In years when severe droughts are declared in a county LFP provides compensation for forage production losses due to drought on rangeland. The level of financial assistance forthcoming through FSA depends upon a number of factors including the severity of the drought.

Ranchers do not pay a fee to receive benefits. They sign up for financial assistance subsequent to a severe drought being declared.

The Risk Management Agency offers the pilot PRF-VI insurance product in Wyoming that can be obtained to address production losses from hay production and grass production on rangeland. The rancher's premium for this insurance is heavily subsidized by the USDA.

Unlike the producers of many other crops, ranchers who suffer production losses in hay production and losses in grass production on rangeland can receive payments from NAP, LFP, and PRF-VI on the same forage loss without any payments offsets.

Appendix

Appendix Table 1: Annual Unit Conversions

Animal Type	Animal Unit Equivalent
Dairy Cow	2.00
All Bulls 2 years or more	2.00
Cattle, buffalo or beefalo 1 year old or more	1.00
Adult cow with nursing calf	1.00
Horses or mules 1 year old or more	1.00
Cattle, horses, mules, buffalo, or beefalo 6 months to 1 year old	.50
Deer	.25
Sheep or Goats	.25
Lambs or kids	.14
Reindeer	.22
Alpaca	.82
Llama	.36
Emu	.51

* Animal Unit (AU) is a standard expression of livestock based on a daily net energy maintenance requirement equal to 13.6 Mcal.

Appendix Table 2: Monthly Payment Rates Under LFP

Kind	Type	Weight Range	Payment Rate Per Head				
			2011	2012	2013	2014	2015
Beef	Adult	Bulls, Cows	\$34.57	\$51.81	\$57.27	\$52.56	\$40.79
	Non-adult	500 pounds or more	\$25.93	\$38.86	\$42.96	\$39.42	\$30.59
Dairy	Adult	Bulls, Cows	\$89.89	\$134.71	\$148.90	\$136.66	\$106.05
	Non-adult	500 pounds or more	\$25.93	\$38.86	\$42.96	\$39.42	\$30.59
Buffalo/Beefalo	Adult	Bulls, Cows	\$34.57	\$51.81	\$57.27	\$52.56	\$40.79
	Non-adult	500 pounds or more	\$25.93	\$38.86	\$42.96	\$39.42	\$30.59
Sheep	All		\$8.64	\$12.96	\$14.32	\$13.14	\$10.20
Goats	All		\$8.64	\$12.96	\$14.32	\$13.14	\$10.20
Deer	All		\$8.64	\$12.96	\$14.32	\$13.14	\$10.20
Equine	All		\$25.58	\$38.34	\$42.38	\$38.90	\$30.18
Swine		Less than 45 pounds	\$1.03	\$1.55	\$1.72	\$1.56	\$1.21
		45 to 124 pounds	\$2.41	\$3.63	\$4.01	\$3.67	\$2.85
		125 to 234 pounds	\$4.15	\$6.22	\$6.87	\$6.31	\$4.90
	Sow	235 pounds or more	\$14.18	\$21.24	\$23.48	\$21.56	\$16.73
	Boar	235 pounds or more	\$8.31	\$12.43	\$13.74	\$12.63	\$9.80
Elk		Less than 400 pounds	\$7.61	\$11.40	\$12.60	\$11.58	\$8.98
		400 to 799 pounds	\$14.18	\$21.24	\$23.48	\$21.56	\$16.73
		800 pounds or more	\$18.67	\$27.98	\$30.93	\$28.39	\$22.03
Poultry		Less than 3 pounds	\$0.22	\$0.33	\$0.36	\$0.33	\$0.26
		3 to 7.9 pounds	\$0.44	\$0.65	\$0.72	\$0.66	\$0.51
		8 pounds or more	\$0.99	\$1.48	\$1.64	\$1.50	\$1.17
Reindeer		All	\$7.61	\$11.40	\$12.60	\$11.58	\$8.98
Alpacas		All	\$28.48	\$42.68	\$47.18	\$43.30	\$33.60
Emus		All	\$17.69	\$26.52	\$29.31	\$26.90	\$20.87
Llamas		All	\$12.62	\$18.91	\$20.90	\$19.18	\$14.89



Copyright 2015 All rights reserved.

The U.S. Department of Agriculture (USDA), Montana State University and the Montana State University Extension prohibit discrimination in all of their programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital and family status. Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Jeff Bader, Director of Extension, Montana State University, Bozeman, MT 59717.