

## Pasture, Rangeland, and Forage Insurance: A Risk Management Tool for Hay and Livestock Producers

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Learn the basic features of Pasture, Rangeland, and Forage insurance coverage, along with issues to consider when deciding whether to use it as a risk management tool.

Nebraska farmers and ranchers who depend on grazing and hay production now have an insurance product available that can provide compensation when drought conditions affect their forage production. This insurance product is called Pasture, Rangeland, and Forage, or PRF, coverage.

Like traditional crop insurance, PRF is backed by USDA's Risk Management Agency (RMA) and is sold by private crop insurance agents. PRF works by paying an indemnity if a rainfall index for the insured's area falls below some guaranteed level.

### Coverage Based on Rainfall Index

PRF coverage is different from traditional crop insurance in one very important aspect: its coverage is based on a rainfall index for a local area rather than an individual operator's production. Precipitation is used as an indicator of expected forage production. Research in this region has shown that forage growth is correlated with precipitation during key spring and summer months.

PRF is single-peril coverage. That is, indemnities are paid only when precipitation conditions warrant. Other causes of loss, such as fire, heat, hail, frost or freeze, as well as insect or disease damage are not covered. PRF coverage is only triggered when the rainfall index for the producer's area falls below a trigger level selected by the producer.

The rainfall index value calculated for an area reflects that period's observed precipitation in relation to a long-term historical average. The index is calculated by expressing the current year's precipitation as a percentage of average

precipitation. For example, if this year's rainfall total for a particular time period was 88 percent of the average, the rainfall index would have a value of 88.

### Rainfall Index Measured Over Designated Grid Area

The rainfall index is based on the rainfall experienced over an entire grid area, rather than the rainfall on an individual farm or ranch or at a specific weather station. In Nebraska, these grids measure about 13 miles from east to west, and about 17 miles from north to south.

Rainfall index values are calculated by the federal government's National Oceanic and Atmospheric Administration (NOAA). NOAA utilizes daily rainfall measurements from the four closest reporting weather stations to a particular grid area to determine a composite rainfall value for that grid.

At sign-up, an insured plot of land is matched to a unique grid on RMA's grid map, which is found on RMA's website or can be provided through a local crop insurance agent. If a producer insures a contiguous plot of land that straddles a grid line, the land may be insured as a single unit in either one of the grids, or it may be insured as separate units divided appropriately among the multiple grids involved. Separate parcels of land located in different grids are insured as separate units.

### What Land Is Eligible?

Both perennial grazing land and hayland may be insured, but land planted to annual forage is not insurable under a PRF policy. Grassed waterways in and around row crop fields that are cut for hay may be designated as hayland and are eligible for PRF coverage. Land enrolled in the Conservation Reserve Program (CRP) or Wetlands Reserve Program is not eligible. Producers must indicate when they sign up for insurance whether they will use the land for grazing or

haying that year. Producers are allowed to insure some but do not have to insure all of their grazing or hayland. Farm Service Agency records can be used to determine the acreage in grassed waterways and other land parcels.

### Dollar Coverage Levels

PRF coverage works by establishing a dollar value of coverage per acre, then calculating premiums and any losses in relation to this value. For each grid area, RMA has established a base dollar value of production for both haying and grazing. The producer also may select a productivity factor which adjusts the base dollar value up or down, from 60 percent to 150 percent of the original base value. A producer may select a higher (or lower) productivity factor to reflect a different productivity level relative to the average for the area, or simply to have a different level of coverage.

Producers also select the guarantee level, which is the percentage of average rainfall at which insurance payments are triggered. Producers may select guarantee levels ranging from 70 percent to 90 percent, in 5 percent increments. The 90 percent guarantee level, for example, means that indemnity payments are triggered whenever rainfall is below 90 percent of the grid average.

The policy's liability (also called "policy protection") is the maximum dollar coverage of the policy, or the amount that would be paid in the event of a complete loss. On a per-acre basis, liability is calculated as the base dollar value of production times the productivity factor times the guarantee level. For example, grazing land with a base dollar value of \$20 per acre and a productivity factor of 150 percent would have a dollar value of production of \$30 per acre ( $= \$20 \times 150\%$ ). If 90 percent coverage is selected, then the total liability is \$27 ( $= \$30 \times 90\%$ ) per acre.

### Coverage Periods and Allocating Protection

Producers also must select time periods, called index intervals, which will be covered by the PRF policy. Index intervals are two months long, and producers must insure at least two intervals during the calendar year. These intervals cannot overlap (e.g., if May-June is insured, then June-July cannot be insured) and need not immediately follow one another. Rainfall is measured over these two-month intervals to calculate the rainfall index values.

After selecting which index intervals to insure, producers must then allocate the total dollar liability across these intervals. Suppose the producer with \$27 of liability per acre allocates 40 percent to the May-June interval and 60 percent to the July-August interval. The liability per acre for the May-June period is thus \$10.80 ( $= \$27 \times .4$ ), and the liability for July-August is \$16.20 ( $= \$27 \times .6$ ).

Some restrictions apply to these allocation percentages. If an index interval is selected, at least 10 percent of the liability must be assigned to that time period. The maximum allocation for any index interval is 60 percent of the total liability.

### Premiums and Subsidies

Producer premiums are calculated as the premium rate times the liability of the policy times the producer's share of the premium. Premiums are calculated separately for each index interval, since each interval has its own liability allocation and a separate rate reflecting the variability of rainfall in that time period. Premiums are subsidized by the government as follows:

Rainfall Index Guarantee Level	Premium Share Paid by Government
90%	51%
80% and 85%	55%
70% and 75%	59%

### Losses and Indemnities

An indemnity is paid only when the rainfall index for the grid area falls below the selected guaranteed level during an insured interval. The size of the indemnity reflects the difference between the actual rainfall index and the guaranteed level selected. A percentage loss value, called the Payment Calculation Factor (PCF), is calculated as the difference between the guaranteed index level and the actual index value, with this difference expressed as a percentage of the guaranteed index value. The PCF is then multiplied by the liability to determine the indemnity.

To illustrate, recall our example where a producer has 90 percent coverage for the July-August interval and a liability for that period of \$16.20 per acre. Suppose the actual rainfall index value for the period turns out to be 65. The PCF is  $(90-65)/90$ , or 0.277, and the indemnity per acre is this factor times the liability per acre:  $\$16.20 \times .277 = \$4.49$ .

RMA posts the calculated rainfall index values online a few weeks after each interval concludes, at which time any loss can be calculated and the corresponding indemnity paid.

### Effectiveness of PRF Coverage

Producers should consider several issues to determine whether PRF coverage is a useful risk management tool for their operation. The effectiveness of PRF coverage will depend on factors such as how closely the rainfall index value mirrors one's own forage production, how premium costs compare to expected payouts, and how well PRF coverage compensates losses when they occur.

One challenge associated with PRF coverage has already been mentioned, namely that the rainfall index value for the grid may poorly reflect the individual producer's own rainfall or forage production. The location of the relevant weather stations relative to one's own land also may be an issue. This may be more important in areas where official reporting stations may be somewhat sparse and distant from one's operation.

Timing of rain events is also an issue. Each index interval lasts two months, and one large rainfall occurring near

the end of the interval may push the index value above the guarantee level even though forage production losses may have occurred. Similarly, large precipitation events with significant runoff could also create a gap between the rainfall index value and the actual forage production realized. Available soil moisture, plant vigor, and air temperatures are all key components of forage growth, and the rainfall index only addresses one of these.

### Selecting Index Intervals

Another coverage issue is selecting which time periods to insure and how to allocate one's total dollar coverage across these intervals. As mentioned earlier, at least two index intervals must be used. From a risk management perspective, the producer should consider selecting those time periods in which precipitation has the greatest impact on forage production. For cool season forage production, precipitation during the months of March through June is critical. For warm season forage production, the most important period for precipitation is typically April through July.

Those months which are critical for forage production in Nebraska also tend to be some of the least expensive to insure. Historically, these months tend to be the wettest months of the calendar year, as well as the times that rainfall is least variable (in relative terms) in Nebraska. The premium rates for PRF coverage reflect this. So insuring the time periods when rainfall matters most for haying and grazing output also tends to be the least expensive.

### Comparing Coverage Levels

Recall that PRF coverage has guarantee levels ranging from 70 to 90 percent of average rainfall values. Historical weather data on the RMA website indicate that for many locations in Nebraska, coverage at the 90 percent guarantee level may receive payments as often as 45 to 50 percent of the time. The same data suggest that coverage at the 70 percent guarantee level would pay roughly half this often. Of course, 90 percent coverage will be more expensive than 70 percent coverage.

The productivity factor and guarantee level selected by the producer will determine the total dollar level of coverage, or liability. One approach to choosing a dollar level of coverage is to use the expected value of production coming from the insured land. For example, hayland that produced three tons of grass hay per acre at \$120/ton would have expected output valued at \$360 per acre. If the base value of production was \$200/acre, a producer could select the 150 percent productivity factor to scale the production value up to \$300/acre. Selecting the 90 percent guarantee level on this amount would result in a total liability or maximum dollar coverage of \$270/acre.

For grazing land, a dollar value of production may be more difficult to determine. One approach is to use pasture rental rates, which could be thought of as the value of the forage harvested by livestock. Another perspective is the cost of purchasing replacement forage. This may be a more useful viewpoint for livestock producers who will need to purchase forage if their own production fails.

The premium subsidy makes PRF insurance more attractive. As the guarantee level goes down, the amount which is subsidized by USDA goes up. Producers need to carefully look at the cost of different levels of coverage and evaluate which options best fit in their operation's risk management plan.

### Online Decision Aids

RMA has a number of Web pages that provide details on the coverage outlined above. A producer can review basic information and a wide variety of links from the following site: <http://www.rma.usda.gov/policies/pasturerangeforage/>. In addition to the policy information on the RMA web-site, more decision tools are available on a website operated by a private company which cooperates with RMA on PRF coverage. The first of these pages helps a producer match their land's location to a particular grid value on a map. The URL for this site is: <https://prodwebnlb.rma.usda.gov/apps/prf>. From this page, a producer can click on links to related decision tools that calculate total dollar coverage and premiums for each coverage level. Rainfall index values also can be obtained by index interval for each year going back to 1948 to determine how frequently the index fell below the respective coverage levels offered under PRF insurance. View these decision tools at: <https://prodwebnlb.rma.usda.gov/apps/prf>.

### Sales Closing Date in the Fall

The deadline in Nebraska to purchase PRF coverage is in the fall preceding the year of coverage. For PRF coverage, this deadline has been around Nov. 15. Contact a crop insurance agent for more information on the deadline this year.

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**Index: Beef  
Business Management**

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