

# Pasture, Rangeland, Forage (PRF) Rainfall Index Insurance in Missouri

Forage and livestock producers in Missouri can buy insurance to mitigate forage production risk. Pasture, rangeland, forage (PRF) insurance was developed by the U.S. Department of Agriculture (USDA) Risk Management Agency (RMA) and has been available in Missouri since 2009. For Missouri, PRF insurance is based on a rainfall index and provides coverage when the precipitation in an area declines from its long-term, historical norm. The deadline for purchasing this insurance is typically in mid-November the year before the calendar year being covered.

## How PRF insurance works

The rainfall index is based on data from the National Oceanic and Atmospheric Administration Climate Prediction Center that is specific to grid locations. Each grid area is 0.25 degrees in latitude by 0.25 degrees in longitude. The grids do not follow state, county or other geopolitical boundaries. The rainfall index is not based on individual farm or individual weather station precipitation data but rather is based on, or interpolated from, data from multiple weather stations. The historical index value, also called the *expected grid index*, is set to a 100 percent level; and an indemnity is paid when precipitation falls below an elected coverage level, the *trigger grid index*.

## Producer choices

Different options are available to provide coverage for a farm. Premiums will vary by the selections made by the producer. Each option should be considered when purchasing PRF insurance.

### Intended use

When using PRF insurance, a producer must select coverage for either grazing or haying purposes (Figure 1). Although acreage under one policy may only be selected to be insured for one intended use, producers can have separate policies even on the same farm, such as 50 acres in one field for grazing and another field of 50 acres for



Figure 1. Drought risk for grazing beef or dairy cattle may be partially mitigated with PRF insurance

haying. Each intended use has its own base county value. The RMA assigns each grid area a base dollar value per acre for grazing and a base dollar value per acre for haying, which reflect typical production values for that area. In Missouri in 2013, the county base level for grazing varied across the state from \$39.21 to \$43.17 per acre, and the county base level for haying was \$142.15 per acre.

### Coverage level

Coverage levels range from 70 to 90 percent. The coverage level establishes the rainfall deviation from the index when insurance pays an indemnity. The government subsidizes different coverage levels at different rates. The government will pay 51 percent of the total premium at the 90 percent coverage level, 55 percent for 80 and 85 percent coverage, and 59 percent for the 70 and 75 percent coverage levels.

### Productivity factor

The productivity factor allows producers to customize their PRF insurance policy based on their specific situation. Producers will select a productivity factor between 60 and 150 percent and will adjust the county base level per acre accordingly. This factor allows producers to adjust their forage value based on the specific productivity of their land. For example, if a farmer feels that a heavily fertilized hay crop needs more protection than the original county base level, then that farmer would select a productivity factor greater than 100 percent to increase the level of coverage.

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## Index intervals

Producers choose coverage in two-month intervals (Figure 2). Factors to be considered when determining which intervals to cover include the type of forage or crop, the intended use, and the time period when precipitation is needed under normal conditions for the insured crop. Producers must allocate the percent of value across the chosen intervals to equal 100 percent. A minimum of two separate and nonoverlapping intervals must be selected, and a minimum of 10 percent and maximum of 60 percent of the coverage may be attributed to any one interval.

### PRF insurance index intervals

January and February  
February and March  
March and April  
April and May  
May and June  
June and July  
July and August  
August and September  
September and October  
October and November  
November and December

**Figure 2. When purchasing PRF insurance, producers must choose coverage in at least two of these two-month intervals that do not overlap.**

## Grid location

A farm's grid identification is based on a point of reference selected by the producer. The point of reference must be within the boundaries of the acreage to be insured. RMA's website provides a grid locator tool, <http://agforceusa.com/rma/ri/prf/maps>, for identifying your land, establishing a point of reference and determining the grid identification (Figure 3). Multiple points of reference may be needed if acreage is noncontiguous or overlays into multiple grids, or if the intended use — haying or grazing — is different for part of the acreage. A producer

may choose multiple points of reference within the insured acreage that are in different grids and have different base values and historical precipitation amounts.

## Indemnity payments

An indemnity is paid when the interpolated precipitation is less than the trigger grid index, which is the specified percentage of the rainfall index. The trigger grid index is determined by the level of coverage selected (70 to 90 percent). For example, if a farmer selected 90 percent coverage, then the final grid index must be below 90 for that two-month interval to trigger an indemnity payment. Actual indemnity payments are based on the difference between the trigger index and the actual index, divided by the trigger index, and multiplied by the policy protection for the index interval (Figure 4).

Because this insurance does not measure, capture or use any actual crop production, a producer could experience a

### PRF insurance indemnity payment example

#### Assumptions

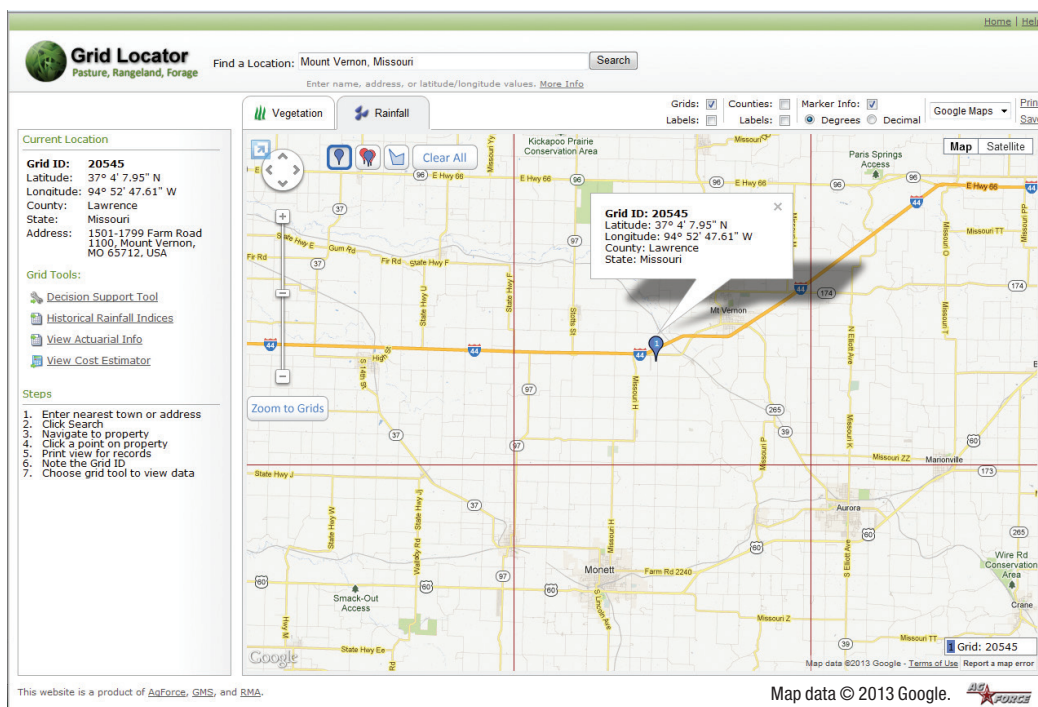
- \$5,000 policy protection for May–June interval
- 90 percent level of coverage (90 trigger grid index)
- Actual rainfall index value of 50

#### Calculation

$$\frac{(\text{trigger index} - \text{rainfall index})}{\text{trigger index}} \times \text{policy protection} = \text{indemnity payment}$$

$$\frac{(90 - 50)}{90} \times \$5,000 = \$2,222$$

**Figure 4. Example indemnity payment calculation.**



**Figure 3. The grid locator enables producers to identify their grid location for their insurance policy.**

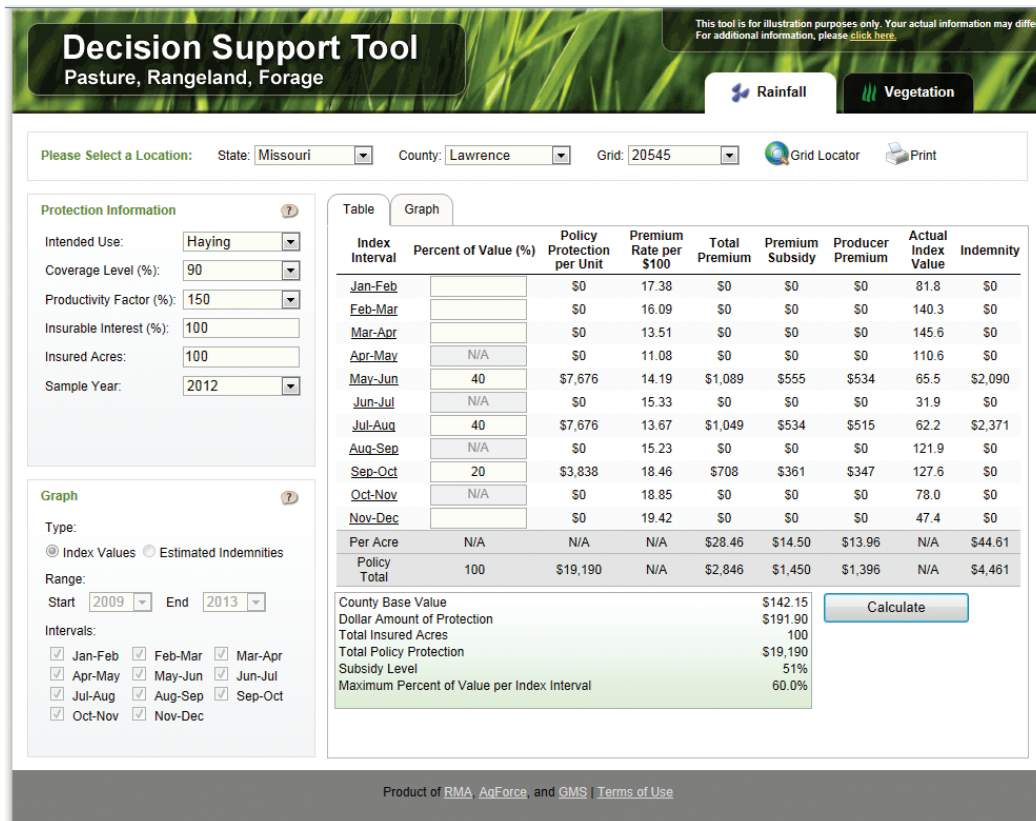


Figure 5. Producers can use the decision support tool website to analyze how PRF insurance would have performed in past years.

loss of production and not receive an indemnity payment, or could receive a payment without suffering an actual loss of production.

## Decision support tool

A decision tool developed by RMA to look at historical PRF policy information is available online at <http://agforceusa.com/rma/ri/prf/dst> (Figure 5). Producers can select a grid location, enter their coverage options and view what the protection level, premiums, subsidies, index value and indemnities would have been for any historical year. Entering options into this tool is a great way to analyze PRF insurance and how it would have performed in past years.

### Haying example

A producer located in Lawrence County, Mo., has a high-quality alfalfa crop and insured it in the year 2012. The farm had a grid location number of 20545. The intended use of the land was haying, and the producer elected the 90 percent coverage level and 150 percent productivity factor for this land. The producer opted to use the May–June, July–Aug. and Sept.–Oct. index intervals at 40 percent, 40 percent and 20 percent, respectively.

Table 1 indicates what the results of this scenario would have been in 2012, which was a major drought year. Only two index intervals resulted in indemnities as Sept.–Oct. was not below the trigger grid index of 90. The producer would have paid premiums of \$13.96 per acre and received indemnity payments of \$44.61 per acre.

### Grazing example

The same producer located in Lawrence County, Mo., grid location number 20545, insured grazing pasture in 2011. The producer elected the 90 percent coverage level and 150 percent productivity factor for this land.

Table 1. PRF insurance, haying example (2012).

Index interval	Percent of value	Producer premium per acre	Actual index value	Indemnity per acre
May–June	40	\$5.34	65.5	\$20.90
July–Aug.	40	\$5.15	62.2	\$23.71
Sept.–Oct.	20	\$3.47	127.6	\$0.00
<b>Total</b>	<b>100</b>	<b>\$13.96</b>	<b>NA</b>	<b>\$44.61</b>

Table 2. PRF insurance, grazing example (2011).

Index interval	Percent of value	Producer premium per acre	Actual index value	Indemnity per acre
May–June	40	\$1.54	81.0	\$2.22
July–Aug.	40	\$1.48	69.4	\$5.07
Sept.–Oct.	20	\$1.00	78.2	\$1.45
<b>Total</b>	<b>100</b>	<b>\$4.02</b>	<b>NA</b>	<b>\$8.74</b>

The producer opted to use the May–June, July–Aug. and Sept.–Oct. index intervals at 40 percent, 40 percent and 20 percent, respectively. Table 2 indicates what the results of this scenario would have been in 2011. The producer would have paid premiums of \$4.02 per acre and received indemnity payments of \$8.74 per acre.

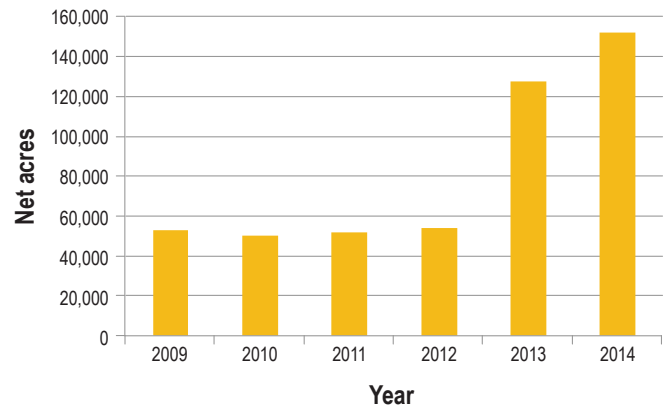
## History of PRF insurance in Missouri

Missouri is a significant forage-production state. In Missouri, about 6.9 million acres are in permanent pasture (USDA Census of Agriculture, 2007) and 3.7 million acres of hay are harvested annually (USDA National Agricultural Statistics Service, 2012). Historical use of PRF insurance in Missouri can be found in Figure 6. Typically, acreage has been close to 50,000 acres in Missouri, but its usage has grown in recent years.

To show how well PRF insurance has paid Missouri farmers in the past, Figure 7 identifies the Missouri farmer premium loss ratio for the years 2009 to 2013. A farmer premium loss ratio can be defined as the indemnities that were paid out to farmers divided by the actual premiums paid by farmers. Note that during the major drought year of 2012, PRF insurance resulted in a farmer premium loss ratio of 3.81. In other words, a farmer premium of \$1.00 resulted in \$3.81 in indemnities when averaged across the state.

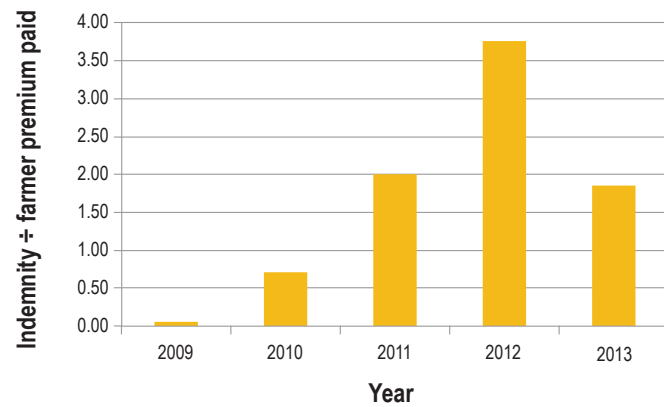
## For more information

For more information about this insurance plan, contact a crop insurance agent. Crop insurance agents are the best sources of information about these policies and can help you understand how the policies could be customized for your farm. The USDA RMA provides a directory of agents that can be searched by state and county online at <http://www3.rma.usda.gov/apps/agents>. The USDA RMA also has PRF policy and insurance standards handbooks available online at <http://www.rma.usda.gov/policies/pasturerangeforage>.



Data source: U.S. Department of Agriculture Risk Management Agency.

**Figure 6. Missouri acreage covered by PRF insurance, 2009–2014 (as of Feb. 17, 2014).**



Data source: U.S. Department of Agriculture Risk Management Agency.

**Figure 7. Farmer premium loss ratio for Missouri PRF insurance, 2009–2013 (as of Feb. 17, 2014).**

### ALSO FROM MU EXTENSION PUBLICATIONS

- G360 *Business Environmental Risk Management: An Introduction*
- G459 *Livestock Risk Protection (LRP) Insurance in Missouri*
- MP749 *Crop Insurance in Missouri*

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