Forage Risk Management Using Pasture, Rangeland, and Forage Insurance

Perennial forage is a primary source of grazing and hay for livestock producers in Mississippi and the United States. Forage production is highly dependent on climate variables, especially rainfall. Because precipitation is unpredictable, producers face continual risk regarding forage yield and availability from season to season. To address this risk, producers can use strategies such as forage diversification, improved soil fertility, and strategic grazing management. In addition to these strategies, this publication provides information on a relatively new insurance product that aims to help forage producers manage forage-production risk arising from lower-than-expected precipitation.

The Pasture, Rangeland, and Forage (PRF) Insurance Program provides subsidized insurance protection for perennial forages produced for grazing or harvested for hay in the U.S. The program is administered by the U.S. Department of Agriculture's Risk Management Agency (RMA). It is a single-peril insurance product, meaning indemnity payments are triggered only by low precipitation during a specified period of time relative to a chosen coverage level. The program is designed to give producers the ability to offset replacement feed costs when low precipitation causes reduced forage production. While this program has value to livestock producers who depend on forage production, it is important to note that PRF insurance is not directly linked to actual forage yields or livestock performance.

PRF Insurance Terminology

Indemnity: The amount of money a producer collects if the rainfall index falls below the coverage level.

Producer premium: The amount of money a producer must pay for a PRF insurance policy.

Subsidy: The portion of the total premium that the Federal Crop Insurance Corporation will pay.

Availability

Availability of PRF in southeastern states has expanded over time. PRF insurance began as a pilot program in select states and in 2016 became available for purchase in Mississippi. During the first year, only one of the 82 counties in Mississippi had any participants in PRF. Participation in 2017 grew to approximately 80,000 acres in Mississippi, which represents less than 4 percent of the 2.2 million acres of forage production in in the state. **Figure 1** shows PRF participation by county in 2016.

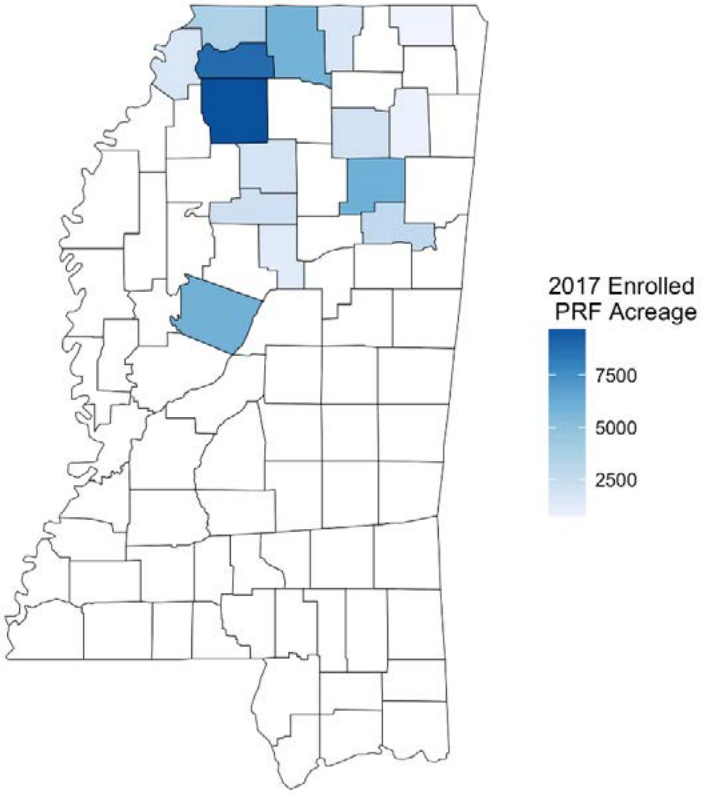

Figure 1. Mississippi 2017 Pasture, Rangeland, and Forage Insurance Program participation by county. Source: USDA RMA

Program Design

PRF is a rainfall index insurance program, which means it uses an index of precipitation for a local area rather than actual precipitation for any single producer's location. These local areas are defined as 0.25 latitude by 0.25 longitude grids, which is approximately 16.5 miles by 14.5 miles in Mississippi. These lines do not follow county lines or town boundaries. **Figure 2** shows an example of the grids that overlay central Mississippi.

Each individual policy is based on the specific grid in which pastureland is located. Rainfall index values are calculated by a weighted average of the four closest National Oceanic and Atmospheric Administration (NOAA) weather stations. Historical index values are also calculated for each grid and are used as the baseline level for the program design. These index values are calculated for eleven 2-month periods referred to as index intervals. The intervals are January/February, February/March, March/April, April/May, May/June, June/July, July/September, September/October, October/November, and November/December. Because the program uses grids and an average of precipitation from nearby stations, rainfall at any single location could be different from the rainfall index calculation for an index interval.

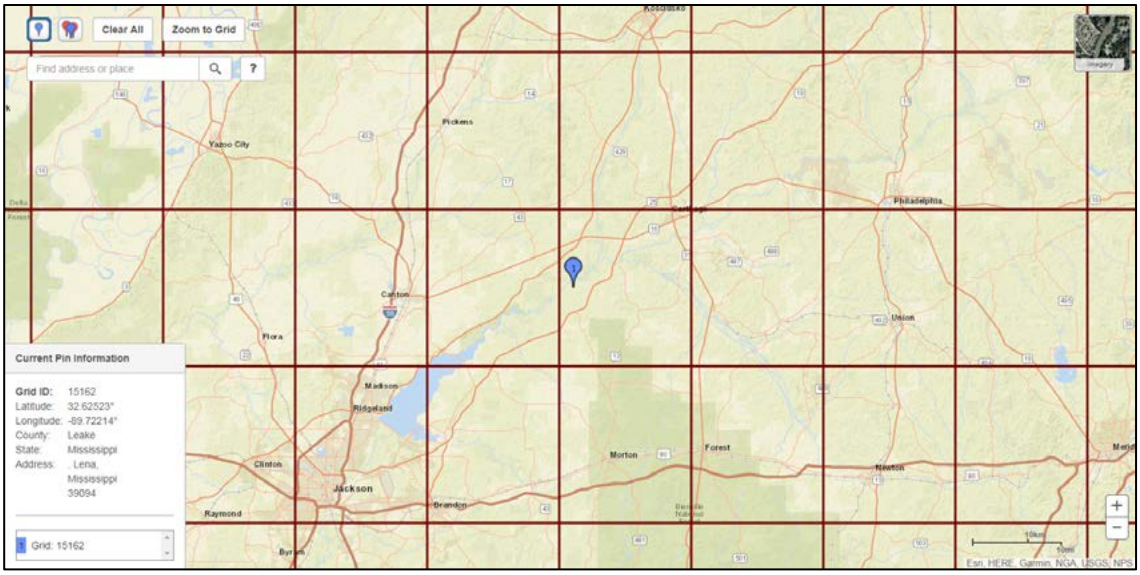

Figure 2. Grid example for central Mississippi. Source: USDA RMA PRF Decision Tool

Indemnity payments for a grid are determined by the current year's rainfall index compared to the historical average index value for a chosen 2-month period and coverage level. For example, if a producer chooses a 75 percent coverage level, an indemnity payment would be triggered if the rainfall level is less than 75 percent of the historical average (i.e., a rainfall index value of less than 75) for his or her grid and index interval.

Producer Decisions

The specifics for each PRF policy depend on decisions made by each individual producer. Decisions that affect coverage level impact the premium cost and the amount of forage value insured.

1. **Number of insured acres:** The producer must choose the number of acres to insure. Producers do not have to insure all of their forage acreage.
2. **Intended use:** Producers must choose between haying or grazing as the intended use for the acreage. Grazing acres have a lower premium cost but also lower potential indemnity payments compared to haying acres.
3. **Irrigation and organic practices:** If a producer chooses haying as the intended use, he/she must also choose irrigated or nonirrigated and indicate whether or not the forage acreage follows organic practices.
4. **Coverage level:** The coverage level is the rainfall index level at which an indemnity payment would be triggered. Possible coverage levels are 70, 75, 80, 85, and 90 percent. Higher coverage levels have higher premium costs. There are different premium subsidy levels depending on the coverage level. Subsidy levels range from 51 to 59 percent, with the lowest coverage level (70 percent) receiving the highest subsidy level (59 percent).
5. **Productivity factor:** Producers can adjust the covered value of their forage by adjusting the productivity factor between 60 to 150 percent. RMA has provided a county base value of production for each county that reflects a typical base dollar value per acre for grazing and a base dollar value per acre for haying for that area. The productivity factor adjusts the coverage level relative to that base value to best represent a producer's coverage preference. Together, the **coverage level** and **productivity factor** decisions determine the dollar amount of protection. For example, if the county base value is $100 per acre, a **coverage level** of 90 percent and **productivity factor** of 125 percent would result in a **dollar protection amount** of $112.50 per acre.
6. **Two-month index intervals and percentages of value:** Producers must choose 2-month intervals for which they want to insure against low rainfall. For example, if a participant chooses 90 percent coverage and January/February and March/April intervals, an indemnity would be paid if the rainfall index in either January/February or March/April fell below 90 percent of its historical average. At least two intervals must be chosen. Participants cannot choose

overlapping intervals (i.e., March/April and April/May). The participant must also place a percentage of value into each chosen interval. The percentage of value would likely depend on the month intervals that are most consequential for forage production. **Figure 3** displays the percentage of Mississippi enrolled acreage in each 2-month interval in 2017. The most popular intervals were January/February, March/April, August/September, and November/December.

The insurance premiums vary depending on the per-acre value, month intervals, and coverage levels chosen. As seen in **Figure 4**, the October/November interval had the highest average premium per acre across both grazing and haying acreage in 2017, while the February/March interval had the lowest per-acre premium. There are trade-offs with choosing the per-acre value and coverage levels. The higher the coverage level, the higher cost of the insurance but the higher chance of a collected indemnity. Similarly, the higher the per-acre insured amount, the higher the cost of the insurance but also the higher the potential indemnity amount.

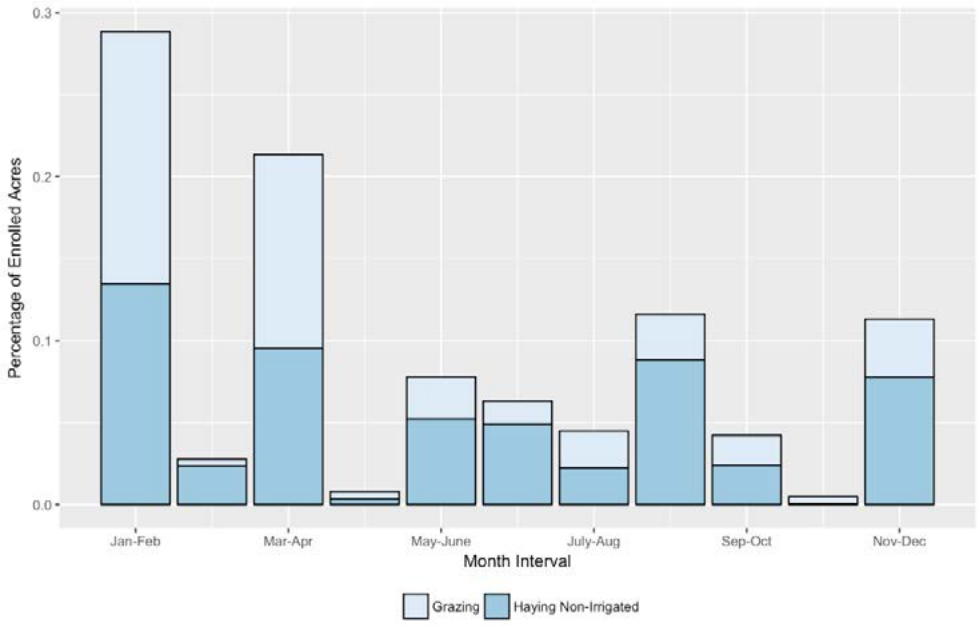

Figure 3. Percentage of PRF-enrolled Mississippi pastureland acreage in 2017 by 2-month interval.
Source: USDA RMA 2017 Summary of Business Reports and Data

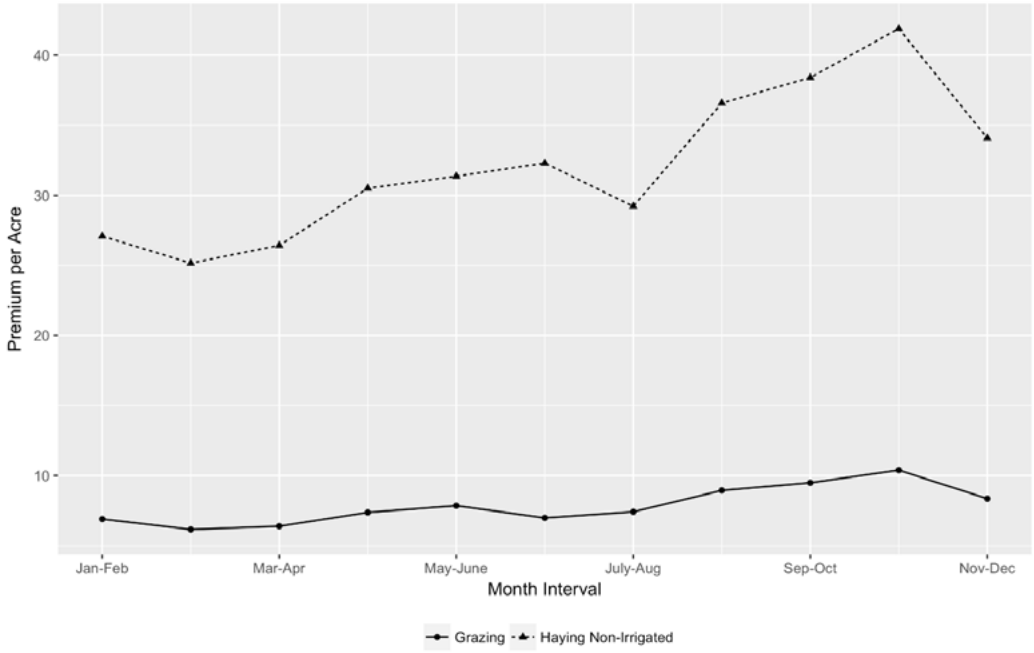

Figure 4. Per-acre premium for Mississippi pastureland enrolled in PRF in 2017 by choice of 2-month interval.
Source: 2017 USDA RMA Summary of Business Reports and Data

Decision Tool and Sign-up Information

USDA RMA provides more information as well as an interactive decision tool at *https://www.rma.usda.gov/policies/pasturerangeforage/*. This tool can be used to search for grids, explore policy options and costs, and plot historical rainfall indices and policy outcomes. PRF insurance can be purchased from any authorized crop insurance agent. The enrollment deadline for each year is November 15 of the prior year.

Conclusion

PRF insurance is a subsidized insurance product that has potential advantages for forage producers in Mississippi. It is not a sufficient risk management strategy on its own—its use should be coupled with other risk-management practices such as forage diversification, improved soil fertility, and grazing management. However, PRF potentially has a role in producers' risk-management strategy as it offers a chosen level of protection against the loss of precipitation. Further, the premiums are subsidized, which reduces the producer's cost of this insurance coverage.

United States Department of Agriculture
National Institute of Food and Agriculture

This material is based upon work supported by USDA/NIFA under Award Number 2015-49200-24228.

Publication 3288 (POD-11-18)

By **Josh Maples**, PhD, Assistant Professor, Agricultural Economics; Brittney Goodrich, PhD, Extension Specialist and Assistant Professor, Agricultural Economics and Rural Sociology, Auburn University; **Rocky Lemus**, PhD, Associate Extension/Research Professor, Plant and Soil Sciences; and **Brett Rushing**, PhD, Associate Extension/Research Professor, Coastal Plain Experiment Station.