



The U.S. Department  
of Agriculture's Pasture,  
Rangeland, and Forage  
Insurance Program

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April 2019

## About the Author

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**This publication was commissioned by AGree to inform and stimulate dialogue; it does not represent official AGree positions. The views expressed in this paper are those of the authors.**

## Foreword | Pasture, Rangeland, Forage

Pasture and rangeland accounts for well over 700 million acres of land across the United States. These working lands are an essential component of our food system, though they are increasingly at risk due to drought and natural disasters. Providing comprehensive insurance policies to livestock producers farming rangeland and pasture can protect against major production risks. These insurance policies are critical to maintaining an effective crop insurance safety net that benefits all producers.

This paper is written by Brandon C. Willis, former Administrator of the U.S. Department of Agriculture's (USDA) Risk Management Agency (RMA), which administers the Federal Crop Insurance Program. It summarizes the history of multi-peril crop insurance policies and the RMA's Pasture, Rangeland, Forage (PRF) insurance product. It also explains how the program operates and provides the context for the economic need for pasture, rangeland, and forage insurance. The paper discusses how pasture, rangeland, and forage insurance can encourage greater conservation adoption on working lands by supporting perennial plant cover and encouraging adoption of Good Farming Practices. Importantly, the paper provides recommendations about how to improve the PRF program. As the program matures, its long-term success will require continued enhancement and maintenance. These improvements have enormous potential for producers, taxpayers, and the environment.

While the concepts discussed in this paper will enrich AGree's discussions, they do not represent official AGree positions. We hope you find this paper to be a useful resource.

A handwritten signature in blue ink that reads "Deb Atwood". The signature is fluid and cursive, with the first letter of each word being capitalized and prominent.

Executive Director, AGree

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## Introduction

The U.S. farm safety net has evolved over the past several decades, with participation in the Federal Crop Insurance Program (FCIP), administered by the U.S. Department of Agriculture (USDA), growing steadily. A number of factors have contributed to this growth, including better coverage for producers, more reliable and timely assistance than ad hoc disaster programs, and potential cost savings (since farmers pay a portion of the cost through premiums). While the program has made significant advancements, coverage is not universal. Even today, certain crops and livestock do not have the same quality of insurance options as others.

Historically, the participation of fruit, vegetable, and livestock producers in the FCIP has lagged behind that of row crop producers. As a result, the USDA has

made concerted efforts to improve the safety net for these underrepresented groups.

Income from animal agriculture accounted for approximately 47 percent of all commodity receipts in 2017 (USDA, ERS 2018). However, as recently as 2005 the USDA's insurance programs offered no policies for livestock producers.

This paper will summarize the history of multi-peril crop insurance (MPCI) policies, examine the USDA's Pasture, Rangeland, and Forage (PRF) insurance program and explain how it operates, provide context for the economic need for the PRF program, and highlight potential options for improving the program.

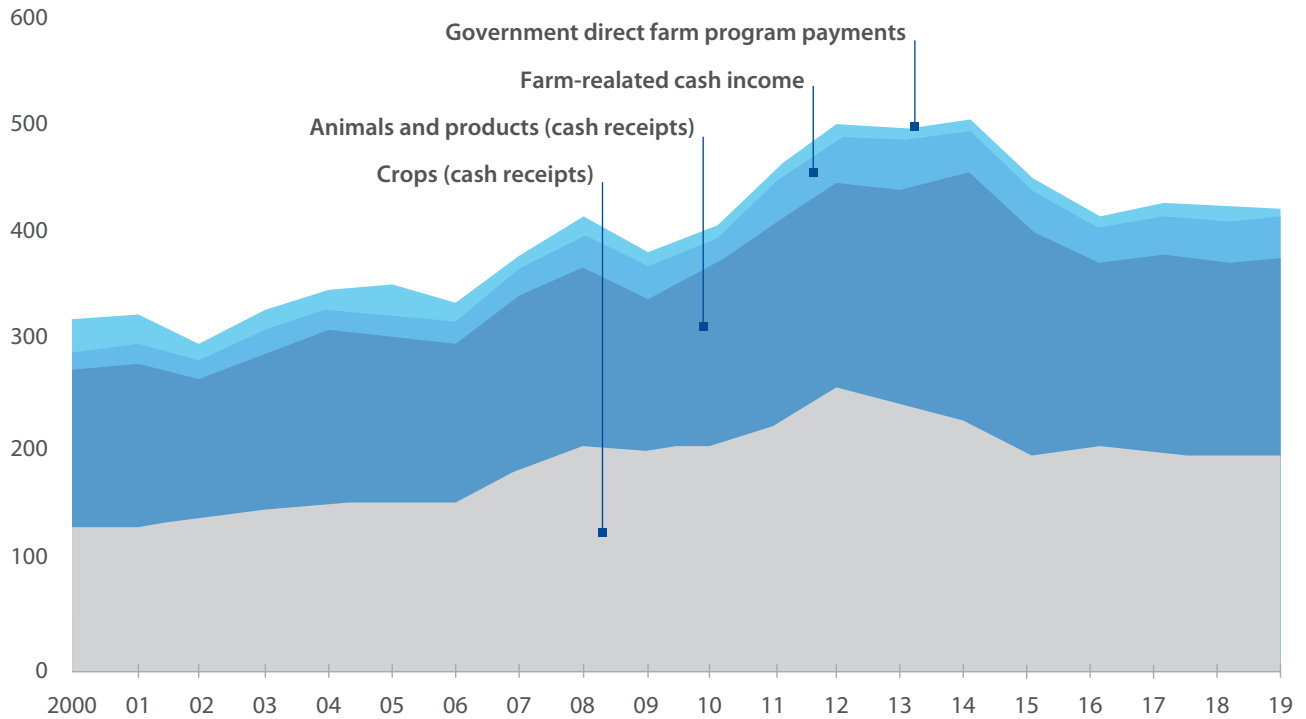
**Figure 1 | Federal Crop Insurance Growth Shown with the Effects of Price Changes Removed (Liability Normalized for 2005-2015 )**

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Normalized Liability for Individual Crops</b>	Actual Liability	\$44.3	\$49.9	\$67.3	\$89.9	\$79.5	\$78.1	\$114.2	\$117.1	\$123.8	\$109.9	\$100.3
	Normalized Liability	\$45.2	\$48.7	\$50.3	\$52.1	\$54.0	\$55.2	\$58.4	\$62.7	\$66.2	\$68.2	\$68.7
	Wheat	\$3.8	\$4.0	\$4.2	\$5.3	\$4.1	\$4.1	\$5.0	\$4.3	\$4.7	\$4.6	\$4.6
	Rice	\$0.4	\$0.4	\$0.4	\$0.4	\$0.5	\$0.6	\$0.5	\$0.5	\$0.6	\$0.9	\$0.9
	Cotton	\$2.5	\$2.9	\$2.0	\$1.8	\$1.9	\$2.3	\$3.3	\$2.9	\$2.6	\$2.9	\$2.5
	Corn	\$14.8	\$16.5	\$19.4	\$17.5	\$18.9	\$19.6	\$21.2	\$23.3	\$24.8	\$23.6	\$23.9
	Sorghum	\$0.4	\$0.4	\$0.5	\$0.5	\$0.4	\$0.4	\$0.4	\$0.4	\$0.5	\$0.5	\$0.6
	Soybeans	\$9.2	\$10.1	\$8.2	\$9.7	\$10.6	\$10.9	\$10.7	\$11.5	\$12.1	\$13.6	\$13.9
	Barley	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.3
	Other	\$13.8	\$14.3	\$15.4	\$16.8	\$17.4	\$17.0	\$17.1	\$19.6	\$20.7	\$21.9	\$21.9

\*Amounts for all crops are in \$ billions.

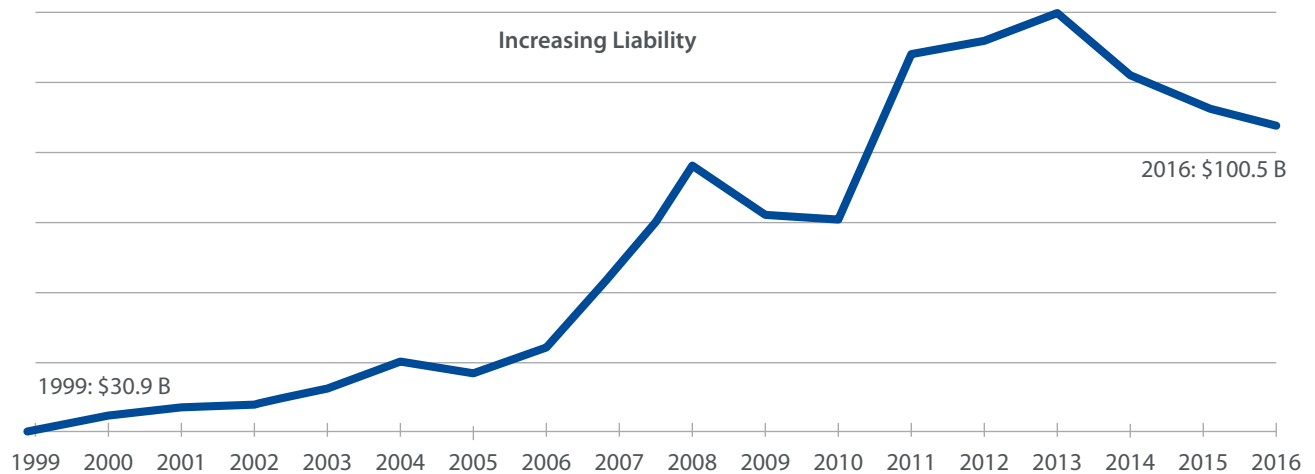
\*\*Normalized Liability reflects the liability if commodity prices were at their 2002-2006 average values. Thus, 'real' growth in the program is due to increases in producer choices of higher coverage levels and amounts of acres or products insured.

**Figure 2 | Gross Cash Farm Income Components, Inflation Adjusted, 2000-19F**



Note: F= forecast. Values are adjusted for inflation using the chain-type GDP deflator, 2019=100  
 Source: USDA, Economic Research Service, Farm Income and Wealth Statistics.  
 Data as of March 6, 2019

**Figure 3 | Federal Crop Insurance Program Growth**



## Multi-Peril Crop Insurance

Although federal crop insurance dates back to 1938, today’s program was shaped during the 1980s by legislation that privatized the delivery of the program and through subsequent legislation enacted in the early 2000s that made it more affordable.

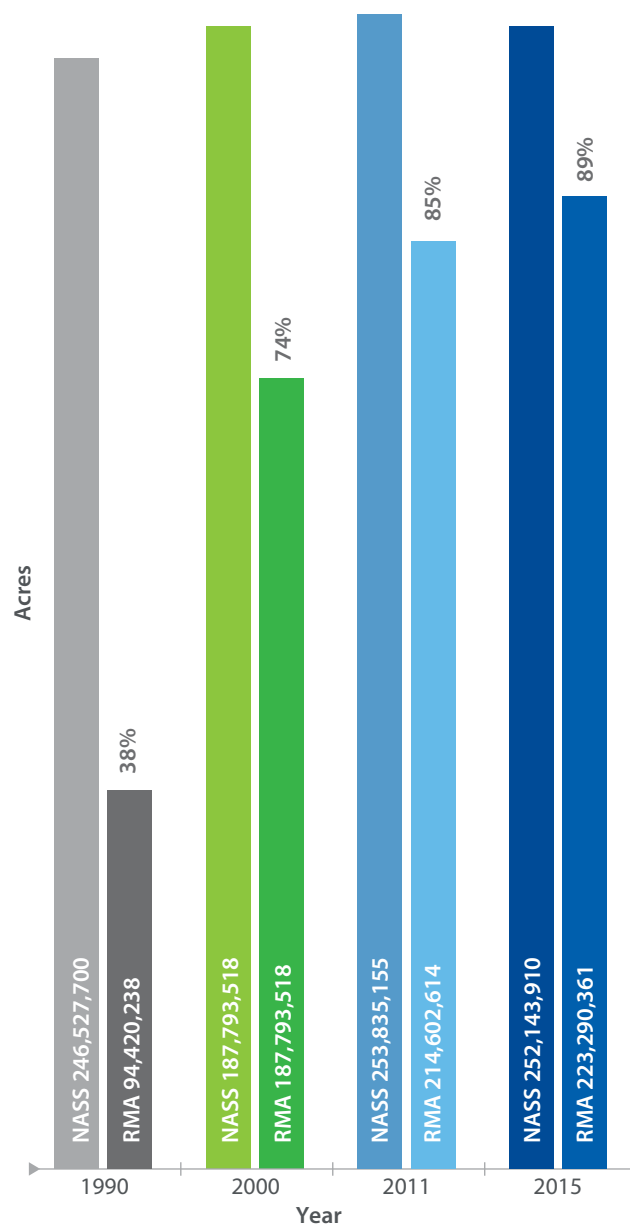
MPCI covers multiple perils. That means it insures producers against natural losses caused by conditions that can destroy crops, such as disease, drought, excessive moisture, freeze, hail, heat, insects, wind, and others. Producers select coverage levels, which range from very low-end catastrophic coverage to more comprehensive coverage (often up to 85 percent). Producers pay a greater portion of the premium when they select higher coverage levels, with the federal government paying the remaining part of the premium. Crop insurance has become so important in mitigating risk that many banks now ask producers about their crop insurance coverage when discussing yearly operating loans.

Today, row crop and specialty crop producers can choose from an array of policies that protect specific crops against both yield losses and revenue losses (whether due to yield or changes in commodity markets) and that come with an array of endorsements. Producers can choose a plan that offers coverage based on their individual operation’s history, or based on the local area’s history. One of the newest policies allows producers of corn, soybeans, wheat, and rice in specific states/counties to purchase insurance that protects their operating margins from increases in input costs and/or decreases in commodity prices.

According to the USDA’s National Agricultural Statistics Service (NASS), the prevalence of MPCI adoption by U.S. farmers is high, particularly for the most widely grown crops. In 2018, U.S. farmers planted 89.6 million acres of soybeans (USDA, NASS 2018) and insured nearly 88 percent of those acres (USDA, Risk Management Agency (RMA) 2019). The figure for corn is nearly identical. Of the 13.5 million acres

of cotton planted in the U.S. in 2018, nearly 13.2 million acres—or 97.4 percent—carried a crop insurance policy. Wheat was insured at a lower rate, with nearly 81 percent of the 47.8 million planted acres protected by a federal crop insurance policy.

**Figure 4 | Percentage of Insured Croplands**



## Pasture, Rangeland, and Forage Insurance

Livestock producers face many of the same risks as row crop producers. Potential price fluctuations and natural disasters—especially drought—affect both Western livestock producers (whose cattle and sheep graze on pasture and rangeland) and Midwestern corn and soybean farmers. In the early 2000s, the USDA's Risk Management Agency attempted to provide an insurance product to address the impact of drought on rangeland. This pilot program covered certain counties in Montana and Wyoming. Unfortunately, it was not well received and did not provide the protection livestock operators expected, leading to its termination.

Another product, the Livestock Risk Protection (LRP) insurance plan, was introduced in 2007. This policy protects against unexpected declines in market prices. Unfortunately, while other USDA insurance policies discount premiums by around 50 percent, the LRP plan effectively offers no premium discount, leading to limited enrollment.

### Pasture, Rangeland, and Forage

Pasture and rangeland account for well over 700 million acres in the United States (USDA, Economic Research Service (ERS) 2017). In 2004, the RMA—which oversees the FCIP—requested proposals for research and the development of policies aimed at mitigating risk for “pasture/rangeland, forage, and hay.” This request indicated a recognition that existing policies were inadequate (USDA, RMA 2004) and noted the difficulties in creating new policies that would assist producers with improved pastures in the Eastern United States while also helping Western ranchers who lease rangeland from the federal government.

The RMA's request pointed out several factors that make it difficult to translate the yield protection and revenue protection policies utilized by row crop insurance into products that offer similar protection for producers who rely on pasture, rangeland, and forage. Because it is difficult to measure and record the production of land

that is grazed, for example, the production history that goes into calculating the guarantee of a yield or revenue policy is impossible. And, there is no easy way to perform the price discovery (i.e., to identify a market price for the forage to use as the basis for the producer's guarantee) (USDA, RMA 2004).

The PRF policy that was developed as a result of the RMA's request does not measure specific losses the way a traditional crop insurance policy does. Instead, the initial PRF policy offered producers a choice between two index tools to determine the likelihood that they would lack the necessary forage for their livestock: the Rainfall Index and the Vegetation Index.

The Vegetation Index was based on the state of vegetation as viewed by U.S. Geological Survey satellites. It sought to determine vegetative health by comparing current satellite imagery to historical reference images. This index was discontinued in 2016 by the Federal Crop Insurance Corporation (FCIC), the board that approves changes to the Federal Crop Insurance Program.

The Rainfall Index is based on precipitation data collected and maintained by the Climate Prediction Center (CPC) of the National Oceanic and Atmospheric Administration (NOAA). The index reflects the level of precipitation relative to the long-term average for a specific area and timeframe. The Rainfall Index is laid out in a nationwide grid system, with each grid being 17 square miles and reflecting the historical precipitation for that parcel. Producers choose the time periods (intervals) for which they wish to insure the land within specific grids; if precipitation falls below the historical average for an insured interval, they receive an indemnity. Whereas MPCCI policies insure against a range of natural causes of loss, PRF policies insure against a single peril—a lack of precipitation. Using the Rainfall Index means the insurance provider does not need to send a claims adjuster to examine a loss claim; if sufficient precipitation (as defined by the policy) did not occur within the grid during an insured interval, the indemnity payment can be issued relatively quickly.



## How the PRF Program Works

**Precipitation:** The PRF program allows a producer to insure between 70 and 90 percent of the historical amount of precipitation received. The historical information is based upon data that goes back to 1948. The program does not measure forage production loss; rather, a lack of precipitation is assumed to correlate to production losses.

**Area:** NOAA has established grids that are .25 degrees by .25 degrees—approximately 17 miles by 17 miles at the equator—across the continental United States. Producers identify the grids where their pastures or rangelands are located (see Figure 5) and use the historical precipitation reported for those areas to determine any potential indemnities.

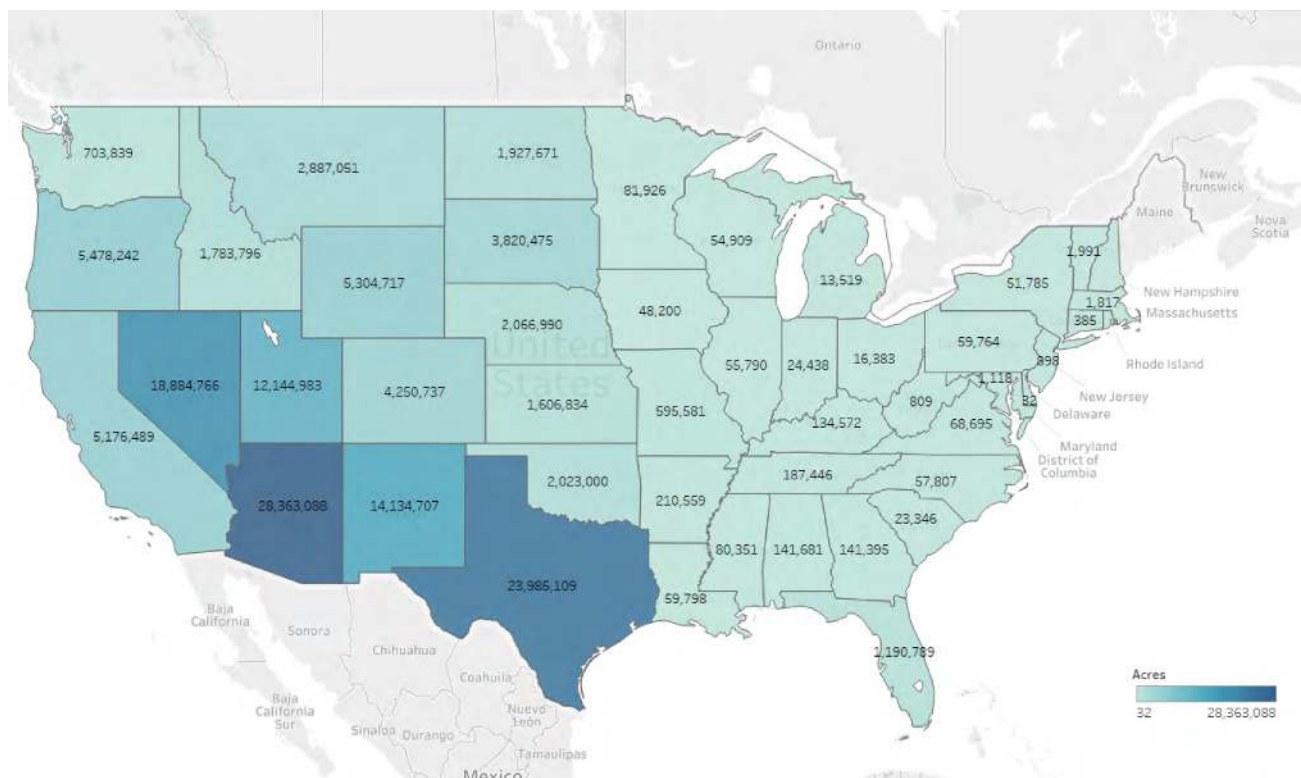
**Eligible acres:** In general, producers can insure their rangeland and pasture. They can also insure grazed or hayed acres that are planted with perennial crops, such as grass or alfalfa. Acres planted with annual forages are not eligible for PRF coverage.

**Productivity factor:** The PRF program recognizes that not all acres within a county have identical levels of production, and thus allows producers to adjust their degrees of protection to better match the value of the expected production on their insured acres. Producers can choose to protect between 60 and 150 percent of the county base value. For non-irrigated acres, this is meant to reflect the approximate value of an acre of forage in a given county.

## PRF Participation Rates

PRF program participation has increased significantly since the program was expanded to all 48 continental states, with the number of covered acres rising from just under 52 million (USDA, RMA 2019a) in 2016 to nearly 140 million (USDA, RMA 2019c) in 2019. This growth demonstrates that ranchers and livestock producers view the PRF program as a viable risk management tool. It is likely that as banks and other agricultural lenders learn more about the program, they will increasingly encourage their clients to consider utilizing it in their operations.

**Figure 5 | PRF Participation Rates by State**



## Impact of Drought on Livestock Operations

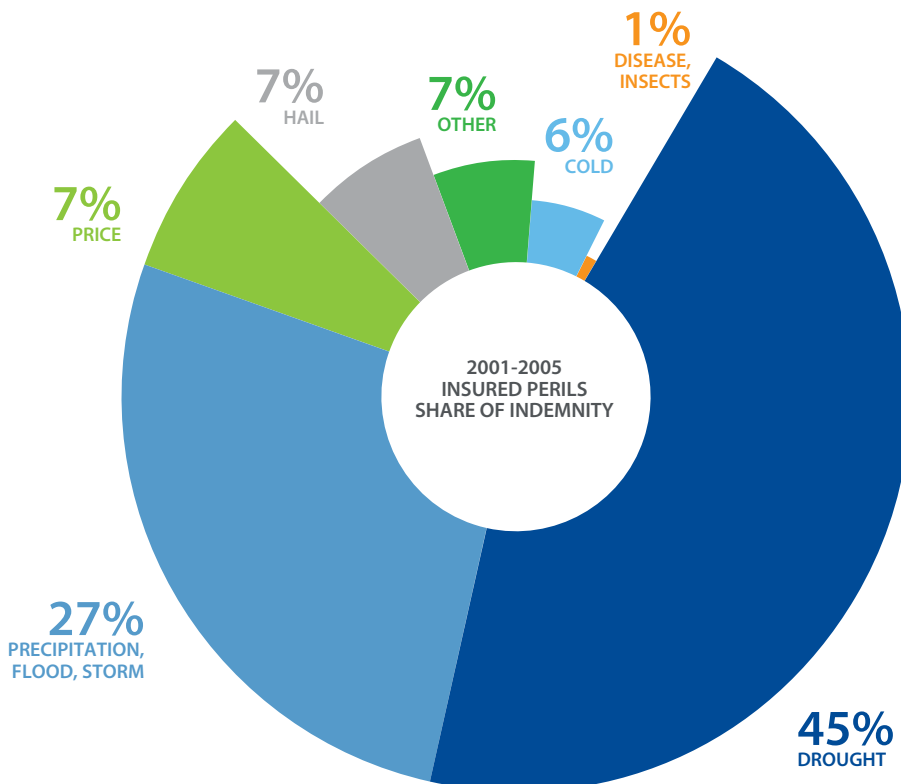
Drought, more than any other natural peril, impacts the bottom line of U.S. producers. Between 2001 and 2015, drought caused 45 percent of the total losses covered by the Federal Crop Insurance Program (see Figure 6). Understanding the financial impact that drought can have on livestock producers is crucial for understanding why producers value the PRF program.

The impacts of drought include drastic reductions in forage availability, reduced irrigation water, the forced early sale of cattle, and wildfires. Drought can also have downstream effects on other production stages, such as conception rates in cows, and calves that do not perform as expected. Additionally, the level of precipitation can impact both the availability and the price of feed. This

combination exacerbates the already tight margins faced by beef producers. Profit margins from 1990 to 2018 averaged \$61.81 per head, with seven out of the past 20 years resulting in negative margins (USDA, NASS 2018). Profit margins are driven by revenue and expenses, and drought conditions impact both categories. For example, the weight of cattle may be lower due to poor forage conditions, leading to reduced revenue. Drought conditions may also lead to herd liquidation and the sale of cattle during non-optimal market conditions.

On the expense side, producers may need to purchase feed, which increases feed expenses. They may also need to provide additional veterinary services, due to problems resulting from poor forage conditions. However, increased feed expense has the most significant impact on profit margin.

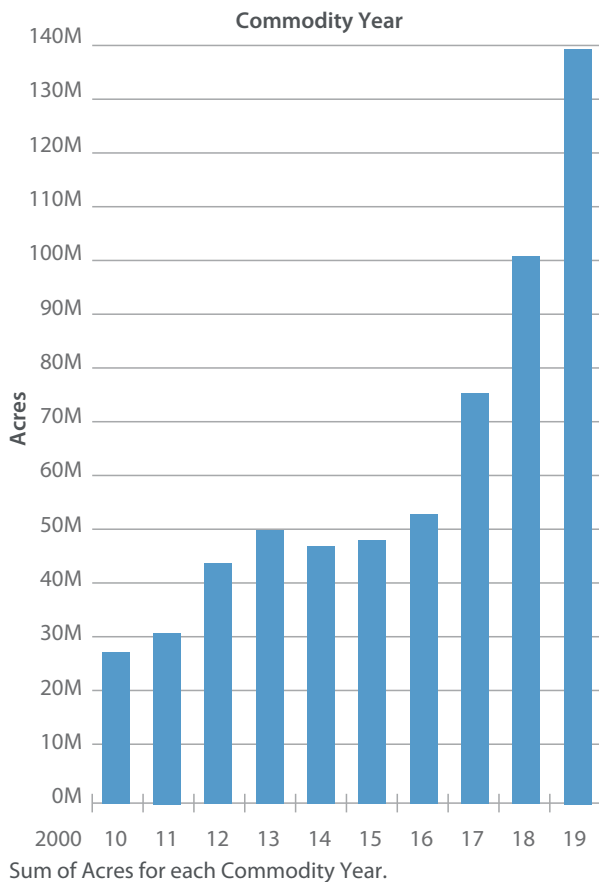
**Figure 6 | National Crop Insurance Indemnities 2001 - 2015**



The University of Minnesota collects farm-level production data from across the United States ([www.finbin.umn.edu](http://www.finbin.umn.edu)). According to this data, feed-related expenses account for more than 72 percent of operating expenses, and feed cost per head grew from an average of \$191/cow in 2000 to \$331/cow in 2016. Even slight changes in feed expense can drastically impact profit margins. This issue is even more of a problem in areas that rely on public land grazing, as in most Western states. An example of the economic implications of drought can be demonstrated using a representative cow/calf operation. Costs and returns are based on a 250-head operation that utilizes public land grazing during the summer.<sup>1</sup> Net returns above operating costs are estimated to be close to \$30 per head. But if this operation has to reduce summer grazing and feed alfalfa for one month, the net returns above operating costs would drop to -\$20 per head.<sup>2</sup>

***“Changes in land use and crop mix can affect environmental quality. Compared to permanent pasture or forest, crop production typically produces higher levels of soil erosion and sediment loss to surface water, higher nitrogen loss to surface and ground water, and lower levels of soil organic carbon. Likewise, crops vary in terms of soil erosion, nitrogen loss, or soil organic carbon”***  
***(Claassen 2017).***

**Figure 7 | PRF Sum of Acres per Year**



## Benefits of the PRF Program

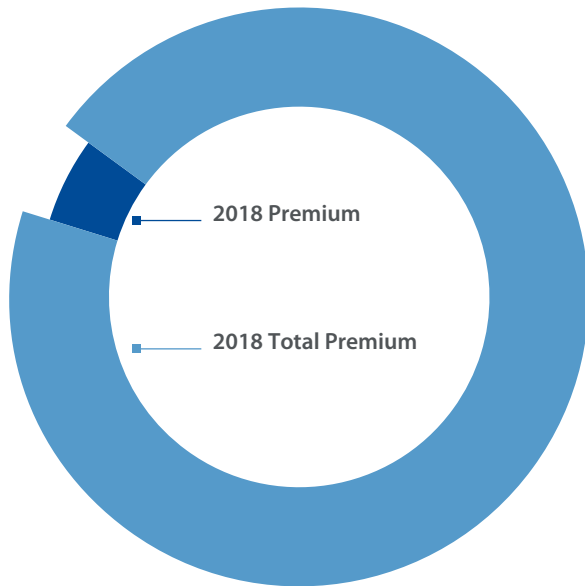
The PRF program is an insurance tool that helps livestock operators stay in business during dry periods. Having a viable insurance operation for livestock producers also supports a balanced safety net, supporting perennial cropping systems and protecting wetland conversion.

### Supporting Perennial Plant Cover

Certain land (often marginal land, or land in areas with limited precipitation) is better suited for perennial forages than for annual cropping. The primary benefits of perennial plant covers are reduced erosion and the protection of wildlife habitat. With perennial plant covers, pastureland typically has significantly lower erosion rates than cropland. Based on NRCS data, in 2015 wind erosion was 88 percent lower on pastureland than on cropland (USDA 2018, 5-67). Sheet and rill erosion were within sustainable levels on 96 percent of pastureland, compared to 84 percent of cropland (USDA, NRCS 2018, 5-70).

Research shows that farmers make planting decisions based upon market conditions (Claassen 2017). Tools such as the PRF program play a key role in ensuring that producers have a viable safety net if a natural disaster strikes after they have chosen to leave the land in perennial plant cover.

**Figure 8 | Total PRF Premium**



### Good Farming Practices

The PRF program can also encourage proper grazing practices. In order to stay in compliance with insurance rules, those who participate in the program must follow generally accepted good farming practices in their area. The definition of “good farming practices” will vary from crop to crop and from region to region. A good rule of thumb is that a producer should follow all of the practices considered prudent and responsible by local extension agents and certified crop consultants in order to produce a crop’s historic yield.

### Conservation Compliance

Since the original Farm Bill’s enactment in 1985, producers who utilize most of the USDA’s array of farm programs (including the FCIP) have been required to certify that they were not planting on highly erodible soils without a conservation plan or draining wetlands to plant crops. According to the USDA, between 1985 and 1995 “conservation compliance coincided with a 38 percent decline in soil erosion on U.S. cropland. Between 1982 and 1997, cropland erosion dropped from 2.93 to 1.83 billion tons per year” (Bowman and Claassen 2017).

The 1996 Farm Bill no longer required that enrollees in the FCIP adhere to these conservation requirements; however, the 2014 Farm Bill recoupled crop insurance with conservation compliance. While many row crop producers had already filed the necessary paperwork to access such programs in the past, many livestock producers who purchased PRF policies after the conservation compliance regulations were updated in 2015 have added acres into compliance for the first time in program history. There is no way to know exactly how many acres are now protected by compliance provisions that would not otherwise be protected. However, with the PRF program now insuring nearly 140 million acres, the amount of newly protected acreage is likely substantial.

## Potential Improvements to the PRF Program

Wisely, the USDA has made the decision to continue operating the PRF program as a pilot. Operating in “pilot” status provides flexibility to address issues that arise. While major changes have not been necessary so far, continued vigilance will be essential as the program expands, as expansion brings visibility and public pressure that has not previously existed. The following are some areas in which the USDA should explore opportunities to improve both the PRF program and other insurance tools for livestock producers.

### Forage Values

The USDA’s insurance programs are meant to compensate for losses below a deductible. With the PRF program, that means paying for losses when precipitation falls below historical averages. PRF payments are based on both precipitation levels and the value of forage per acre. The value of forage per acre is determined by the FCIC’s county base value per acre, which is the “determined value of the crop in the county” (USDA, RMA 2018). In its simplest form, the county base value is, particularly for non-irrigated land, an estimate of the value of forage produced on the land during a normal year. PRF payments are made based upon the amount of precipitation below normal and the county base value.

The USDA has changed the county base values significantly over the years, attempting to ensure they are consistent with the actual market values producers experience. Continued efforts to align county base values will ensure that payments to producers are neither higher nor lower than appropriate. If, in the future, the RMA adjusts the county base values, consideration should be given to capping increases or decreases at a certain level so that changes are incremental.

### Correlation with Precipitation

The correlation between dry conditions and insurance payments is critical to the long-term success of the PRF program. In certain Western states with significant elevation variability, higher elevations typically receive significantly more precipitation than lower elevations. However, the NOAA CPC precipitation data used by the Rainfall Index does not account for variances in elevation. When new weather stations are installed at higher elevations, it is possible to record higher amounts of precipitation—not due to additional precipitation overall, but due to the placement of the weather stations. Preliminary research indicates that in isolated situations in the Western United States, the placement of weather stations at higher elevations may correlate to reduced PRF payments.

Further research is necessary to ensure that the placement of weather stations at higher elevations does not impact PRF precipitation data in a way that harms producers. The USDA could undertake or request outside research on this topic. Until such analysis is conducted, the RMA could consider reinstating the Vegetation Index and allow producers to choose between the two indices. This would allow producers, in areas where the Rainfall Index may not offer significant protection, an opportunity to insure against a lack of precipitation.

### Long-Term Droughts

Increasing participation suggests that producers are satisfied with the PRF program. However, the program is not designed to compensate for long-term drought. PRF indemnities are tied solely to a deviation from

normal precipitation for the two-month intervals insured. Additionally, since the program only requires that two intervals be insured, a producer may choose to only insure for four months of the year. As such, the impacts of sustained, multi-year droughts may not be adequately addressed. The USDA should consider whether the PRF program adequately protects livestock operations against significant multi-year droughts, or whether policy enhancements could help mitigate the risks posed by such scenarios.

### Interval Lengths

The current PRF model that allows producers to insure for a minimum of two, and a maximum of six, two-month intervals has worked well and should be maintained. However, analysis that considers insurance for longer intervals—such as three-month or four-month intervals—should be conducted. Longer intervals may result in reduced premiums, which would benefit both producers and taxpayers. In addition, reduced precipitation over longer periods of time may justify increased payments to compensate for sustained levels of low precipitation.

### Enhanced Livestock Products

Livestock market fluctuations are a major risk for livestock producers. While nearly 85 percent of crop insurance premiums are revenue policies (i.e., they address intra-year price risk), only 1 percent of cattle and sheep producers utilize insurance to protect themselves against price risk (see Figure 9) (USDA, RMA 2017). Improving the affordability of the LRP plan should therefore be a top priority. Furthermore, policy improvements that do not cost money but that improve the product (such as allowing the LRP plan to be purchased prior to the birth of offspring) would be consistent with opportunities afforded to row crop producers. Revenue policies protect against price declines months before a crop is in the ground; similar options would help livestock producers protect against price declines.

**Figure 9 | Livestock Market Penetration 2015**

Federal Crop Insurance: Livestock Insurance Market Penetration for 2015*				
Livestock	2015 Total Insured Head/CWT Milk	2015 NASS Total Head/CWT	Market Penetration	Source for U.S. Numbers
Cattle (head)	232,192	29,204,200	1%	NASS Livestock Slaughter 2015 Jan-Dec Summary (Sum of Cattle on Feed, Heifers, Bulls, Steers, Calves (excluding breeding stock))
Dairy (cwt)	48,721,339	2,086,330,000	2%	NASS Milk Production, report dated January 2017
Lamb (head)	4,063	2,223,500	Less than 1%	NASS Livestock Slaughter 2015 Jan-Dec Summary
Swine (head)	157,311	115,425,200	Less than 1%	NASS Livestock Slaughter 2015 Jan-Dec Summary

Data as of April 3, 2017

### Vegetation Index (VI)

As previously mentioned, the RMA originally offered two indices as part of the PRF program: the Rainfall Index and the Vegetation Index. States where the Rainfall Index was utilized experienced higher participation levels, so in 2015 the FCIC board of directors eliminated the Vegetation Index. However, at the time it appeared that the reasons for removal were in part due to a lack of understanding about how the VI worked rather than because of a problem with the index itself. The RMA could reinstate the VI and allow producers to choose which option best suits their needs. It is likely that the Rainfall Index was a more popular product in the early years of the PRF program because both insurance agents and producers were less familiar with the program than they are today. The Rainfall Index is easier to understand, which likely impacted its adoption rates relative to the VI. However, as more producers are coming to understand the intricacies of the PRF program, allowing producers to choose which option best suits their operations should be considered.

### Producer Education

PRF program adoption varies throughout the country. In Arizona, for example, approximately 50 percent of eligible grazing acres are enrolled (USDA, ERS 2017). In other states that figure is much lower. For example, in Alabama, only 4 percent of acres are enrolled. Factors such as likelihood and impact of drought may play a role in adoption rates, particularly when one looks at adoption rates in the states that most frequently suffer from drought. It is also likely that producer education, specifically as a result of agent outreach efforts, plays a key role in PRF program adoption. Due to the relative lack of experience that livestock producers have with the FCIP, producer word-of-mouth plays a significant role in PRF program adoption. It is likely that adoption rates will continue to grow. However, if the USDA determines that certain states or regions are underserved, it could provide funding for risk management education in those underserved areas.

## Conclusion

As noted previously, the livestock sector represents 47 percent of all commodity receipts. Providing insurance policies that effectively protect this significant sector against major production risks is vital. The Risk Management Agency deserves credit for its efforts to provide such a product, as well as for its continued efforts to promote program expansion. With that in mind, continued efforts to refine and improve the PRF program should be undertaken. As the program grows in both participation and importance, issues that might have been previously overlooked or deemphasized should be examined and addressed in light of the program's increasing reach and value. The PRF program will continue to grow, but its long-term success will likely require continued enhancement measures. These improvements, if done properly, will benefit both producers and taxpayers.

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## Endnotes

- 1 Costs and returns are based on production budgets for the state of Utah. For more information, visit [extension.usu.edu](http://extension.usu.edu).
- 2 This is based on the assumption that each cow will eat 20 pounds of alfalfa each day for one month, at a cost of \$150 per ton for alfalfa.

## About AGree

AGree drives positive change in the food and agriculture system by connecting and challenging leaders from diverse communities to catalyze action and elevate food and agriculture as a national priority. AGree recognizes the interconnected nature of food and agriculture systems globally and seeks to break down barriers and work across issue areas. Through collaboration and frank discussion, AGree continues to encourage a broad coalition of interests to build trust, find common ground, and develop shared strategies for achieving transformative change.

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