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

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Background on Missouri

* Missouri is a significant forage-production state
* 6.9 million acres in permanent pasture (USDA Census of Agriculture, 2007)
* 3.7 million acres of hay harvested annually (USDA, 2012)
PRF Insurance Basics

* Developed by USDA RMA, available in Missouri since 2009
* Mitigates forage production risk for forage and livestock producers
* For Missouri, it is based on a rainfall index, which provides coverage when precipitation falls below an area’s long-term, historical norm
* Deadline for purchase: **November 15, 2013**
PRF Insurance Availability

Insurance Plan
- (13) Rainfall Index
- (14) Vegetation Index
How PRF Insurance Works

* Rainfall index based on data from the NOAA Climate Prediction Center
* Data is specific to grid locations (0.25 degrees in latitude by 0.25 degrees in longitude)
* Rainfall index based on multiple weather stations’ precipitation data (NOT INDIVIDUAL FARM DATA)
* An indemnity is paid when precipitation falls below a chosen coverage level
* Different options include:
  * Intended use
  * Coverage level
  * Productivity factor
  * Index intervals
  * Grid location
**Intended Use**

* Producers select coverage for either grazing or haying purposes
* Only one purpose may be chosen per policy, but producers can have multiple policies on the same farm
  * Example: 50 acres in one field for grazing and another field of 50 acres for haying
* RMA assigns a base county value for grid areas and each purpose
  * Missouri in 2013: Grazing ranged from $39.21 to $43.17 per acre, haying at $142.15 per acre
Coverage Level

* Ranges from 70 to 90 percent
* Establishes the rainfall deviation from the index when insurance pays an indemnity
* Government subsidizes the program depending on the coverage level selected:
  * Pays 51 percent of the premium at the 90 percent coverage level
  * 55 percent for 80 and 85 coverage levels
  * 59 percent for 70 and 75 coverage levels
Producers choose a productivity factor between 60 and 150 percent to further customize the policy.

- Adjusts the base county value (for haying or grazing) based on the productivity of the land.

Example:
- Original county base value = $142 per acre
- Producer selects a 150 percent productivity factor
- New protection level = $213 per acre ($142 x 150%)
Index Intervals

* Coverage is based on two month intervals
* Consider type of forage, when precipitation is needed and intended use
* Percent of value must be allocated across intervals to equal 100 percent.
  * Minimum of 10 percent per interval
  * Maximum of 60 percent per interval

PRF 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

Yield distribution of tall fescue in Missouri
Source: MU Extension Guide M181
Grid Location

* Grid identification is based on a point of reference selected by the producer
* Must be within the boundaries of the acreage to be insured
* Non-contiguous land areas and different intended uses may require the use of multiple points

Indemnity Payments

* Indemnities are paid when the interpolated precipitation is less than the trigger grid index
* Trigger grid index is determined by coverage level selected (70 to 90 percent)
* Indemnity payment calculation:
  * \[ \left( \frac{\text{trigger index} - \text{rainfall index}}{\text{trigger index}} \right) \times \text{policy protection} = \text{indemnity payment} \]
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 occurs

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

* Math:
  * \( \frac{(90 - 50)}{90} \times 5000 = 2222 \)
**PRF Insurance - Haying Example**

- A producer in Lawrence County, MO, insures a high-quality alfalfa crop in 2012
- Grid location number of 20545 and intended use of land: haying
- Selected a 90 percent coverage level and 150 percent productivity factor
- Used May-June, July-Aug. and Sept.-Oct. index intervals at 40 percent, 40 percent, and 20 percent respectively

<table>
<thead>
<tr>
<th>Index Interval</th>
<th>Percent of value</th>
<th>Producer premium per acre</th>
<th>Actual index value</th>
<th>Indemnity per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>May-June</td>
<td>40</td>
<td>$5.34</td>
<td>65.5</td>
<td>$20.90</td>
</tr>
<tr>
<td>July-Aug.</td>
<td>40</td>
<td>$5.15</td>
<td>62.2</td>
<td>$23.71</td>
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<tr>
<td>Sept.-Oct.</td>
<td>20</td>
<td>$3.47</td>
<td>127.6</td>
<td>$0.00</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>$13.96</td>
<td>N/A</td>
<td>$44.61</td>
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</tbody>
</table>
PRF Insurance - Grazing Example

- Same producer as before in Lawrence County, MO, insured in 2011
- Grid location number 20545 and intended use of land: grazing
- Selected an 90 percent coverage level and 150 percent productivity factor
- Used May-June, July-Aug. and Sept.-Oct. index intervals at 40 percent, 40 percent, and 20 percent respectively

<table>
<thead>
<tr>
<th>Index interval</th>
<th>Percent of value</th>
<th>Producer premium per acre</th>
<th>Actual index value</th>
<th>Indemnity per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>May-June</td>
<td>40</td>
<td>$1.54</td>
<td>81.0</td>
<td>$2.22</td>
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<tr>
<td>July-Aug.</td>
<td>40</td>
<td>$1.48</td>
<td>69.4</td>
<td>$5.07</td>
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<tr>
<td>Sept.-Oct.</td>
<td>20</td>
<td>$1.00</td>
<td>78.2</td>
<td>$1.45</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>$4.02</td>
<td>N/A</td>
<td>$8.74</td>
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</table>
Decision Support Tool

* Tool developed by RMA to look at historical PRF policy information

* Allows users to select grid location and enter coverage options to view:
  * Protection level
  * Premiums
  * Subsidies
  * Index value
  * Indemnities

### Protection Information

- **Intended Use:** Haying
- **Coverage Level (%):** 90
- **Productivity Factor (%):** 150
- **Insurable Interest (%):** 100
- **Insured Acres:** 100
- **Sample Year:** 2012

### Table

<table>
<thead>
<tr>
<th>Index Interval</th>
<th>Percent of Value (%)</th>
<th>Policy Protection per Unit</th>
<th>Premium Rate per $100</th>
<th>Total Premium</th>
<th>Premium Subsidy</th>
<th>Producer Premium</th>
<th>Actual Index Value</th>
<th>Indemnity</th>
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<tbody>
<tr>
<td>Jan-Feb</td>
<td></td>
<td>$0</td>
<td>17.38</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>81.8</td>
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<td>Feb-Mar</td>
<td></td>
<td>$0</td>
<td>16.09</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>140.3</td>
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<td>Mar-Apr</td>
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<td>$0</td>
<td>13.51</td>
<td>$0</td>
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<td>$0</td>
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<tr>
<td>Apr-May</td>
<td>N/A</td>
<td>$0</td>
<td>11.06</td>
<td>$0</td>
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<td>$0</td>
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<tr>
<td>May-Jun</td>
<td>40</td>
<td>$7,676</td>
<td>14.19</td>
<td>$1,089</td>
<td>$555</td>
<td>$534</td>
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<tr>
<td>Jun-Jul</td>
<td>N/A</td>
<td>$0</td>
<td>15.33</td>
<td>$0</td>
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<td>$0</td>
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<td>$0</td>
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<tr>
<td>Jul-Aug</td>
<td>40</td>
<td>$7,676</td>
<td>13.67</td>
<td>$1,049</td>
<td>$534</td>
<td>$515</td>
<td>62.2</td>
<td>$2,371</td>
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<tr>
<td>Aug-Sep</td>
<td>N/A</td>
<td>$0</td>
<td>15.23</td>
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<td>$0</td>
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<td>121.9</td>
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<tr>
<td>Sep-Oct</td>
<td>20</td>
<td>$3,838</td>
<td>18.46</td>
<td>$708</td>
<td>$361</td>
<td>$347</td>
<td>127.6</td>
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<tr>
<td>Oct-Nov</td>
<td>N/A</td>
<td>$0</td>
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<td>$0</td>
<td>$0</td>
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<tr>
<td>Nov-Dec</td>
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<td>$0</td>
<td>19.42</td>
<td>$0</td>
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<tr>
<td>Per Acre</td>
<td>N/A</td>
<td>N/A</td>
<td>$28.46</td>
<td>$14.50</td>
<td>$13.96</td>
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<tr>
<td>Policy Total</td>
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<td>N/A</td>
<td>$2,846</td>
<td>N/A</td>
<td>$1,450</td>
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</tbody>
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**County Base Value:** $142.15
**Dollar Amount of Protection:** $191.90
**Total Insured Acres:** 100
**Total Policy Protection:** $19,190
**Subsidy Level:** 51%
**Maximum Percent of Value per Index Interval:** 60.0%
* An educational program designed to make precise weather information available to Missouri farmers in a way that assists them in managing their business

* Site-specific weather reports and advisories are sent to participating farmers via quickly downloaded emails
The University of Missouri Commercial Agriculture Program received a grant from the USDA Risk Management Agency to add a PRF Module to Horizon Point.

In February 2014 we will launch the PRF module.

Farmers can subscribe and have 9 months to examine how the NOAA precipitation estimates used in PRF insurance compare to their actual precipitation measurements.

Farmers can observe daily what NOAA is reporting as precipitation on specific grids – provide transparency in the insurance product.
Additional Information

* For more information on PRF insurance, contact a crop insurance agent.
  * They are the best source to help you understand and customize a plan for your farm.
Additional Information

* Premium Rates, County Base Values, Subsidy Factors, Practices and Options can all be researched by county and grid location for PRF – Rainfall Index

* PRF Insurance in Missouri Guide Sheet
  * [http://extension.missouri.edu/p/G457](http://extension.missouri.edu/p/G457)