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: Typically **November 15** each year
PRF Insurance – Missouri Acreage

Source: USDA – Risk Management Agency (As of Feb. 17, 2014)
PRF Insurance – Missouri
Indemnity/Farmer Premium Paid

Source: USDA – Risk Management Agency (As of Feb. 17, 2014)
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
Producer Choices

Different options include:

- Intended use
- Coverage level
- Productivity factor
- Index intervals
- Grid location
* 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 2014: Grazing ranged from $39.21 to $43.17 per acre, haying at $142.09 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 \times 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:
  * \[ \left( \frac{90 - 50}{90} \right) \times 5000 = 2222 \]
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>
</tr>
<tr>
<td>July-Aug.</td>
<td>40</td>
<td>$1.48</td>
<td>69.4</td>
<td>$5.07</td>
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<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

Decision Support Tool: http://agforceusa.com/rma/ri/prf/dst
### 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>
</tr>
</thead>
<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>
<td>$0</td>
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<td>Mar-Apr</td>
<td></td>
<td>$0</td>
<td>13.51</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>145.6</td>
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<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>$34</td>
<td>65.5</td>
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<tr>
<td>Jun-Jul</td>
<td>N/A</td>
<td>$0</td>
<td>15.33</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>31.9</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>$15</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>
<td>$0</td>
<td>$0</td>
<td>$0</td>
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<td>$0</td>
</tr>
<tr>
<td>Sep-Oct</td>
<td>20</td>
<td>$3,838</td>
<td>18.46</td>
<td>$708</td>
<td>$361</td>
<td>$17</td>
<td>127.6</td>
<td>$0</td>
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<tr>
<td>Oct-Nov</td>
<td>N/A</td>
<td>$0</td>
<td>18.85</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>78.0</td>
<td>$0</td>
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<tr>
<td>Nov-Dec</td>
<td></td>
<td>$0</td>
<td>19.42</td>
<td>$0</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>
<td>$4.461</td>
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<tr>
<td>Policy Total</td>
<td>100</td>
<td>$19,190</td>
<td>N/A</td>
<td>$2,846</td>
<td>$1,450</td>
<td>$1,396</td>
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</tr>
</tbody>
</table>

### Graph

- Type: Index Values, Estimated Indemnities
- **Range:** Start 2009, End 2013

**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

Web address: http://agebb.missouri.edu/horizonpoint/
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 Spring 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.
Grant project also provided funding for 10 intensive workshops (4-5 hours each) throughout Missouri on:

- PRF Insurance
- Livestock Risk Protection (LRP)
- Livestock Gross Margin (LGM)
- Using weather information to manage production risk

Dates and locations have not be set yet, our goal is to hold them between May and September 2014.
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.

* USDA RMA Agent Directory
  * http://www3.rma.usda.gov/apps/agents

* USDA RMA PRF Policy and Insurance Standards Handbook:
  * http://www.rma.usda.gov/policies/pasturerangeforage
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)