

# Protecting Your Forage Supply:

## Pasture, Rangeland, and Forage (PRF) Insurance

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## PRF Insurance: background

- Program of Risk Management Agency (USDA)
- Insures land for grazing or haying
  - Established acreage of perennial forage
  - Acreage must be suitable for intended use
  - Intended to provide \$\$\$ to purchase replacement feed
- Started as a pilot program in 2007, available in Kansas since 2009
- Area-based product which uses a rainfall index method to insure against low precipitation

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## PRF Insurance: background

- Sold by private insurance agents
- Significant premium subsidy
  - 51-59% paid by USDA
- Covers a wide variety of conditions
  - Differences in growing seasons, forage types, etc.
- Don't have to insure all eligible acres

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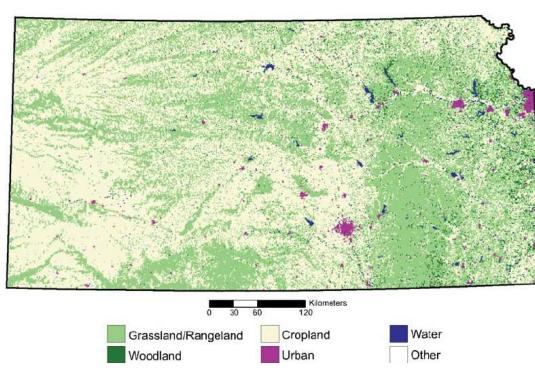
## The PRF numbers for Kansas...

15.5 million acres of permanent pasture

308,000 acres of woodland pastures

2.2 million acres of alfalfa, tame & wild hay

[18.0 million acres eligible for PRF](#)



Source: 2012 Census of Agriculture

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## How much is 18 million acres?

Crop	Acres planted In 2017	Acres insured In 2017	% insured In 2017
Wheat	7.3 million	6.8 million	94
Grain sorghum	2.3 million	2.0 million	89
Corn	5.5 million	5.1 million	93
Soybeans	5.1 million	4.2 million	83
<b>Total BIG 4 crops</b>	<b>20.2 million</b>	<b>18.1 million</b>	<b>90</b>
Pasture & perennial forages	18.0 million	802,249	4.5

Source: Risk Management Agency, USDA



## PRF uses a rainfall index

- Index expresses **ACTUAL** as % of **NORMAL**:

$$\frac{\text{Actual precip}}{\text{Normal precip}} \times 100$$

*Example:*

$$\frac{\text{Actual: } 4.5''}{\text{Normal: } 6''} \times 100 = 75$$

- If actual rainfall index falls below guaranteed level, the insurance pays an indemnity
- Can guarantee from 70% up to 90% of normal precipitation



## But why insure precipitation?

- PROBLEM: how can we insure forage production when we usually don't measure pasture / forage output?
- ANSWER: use another measure as a proxy for forage production
  - "Meaningful" - will closely reflect forage production
  - "Measureable" –feasible to obtain, understandable, even have "official" values

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## Whose rainfall?

- Uses NOAA Climate Prediction Center data
  - Minimum of 6,000 stations reporting daily, usually over 15,000 stations report daily across US
- Uses multiple stations to calculate a composite precip value for each grid area
  - 4 closest reporting stations used
  - Don't rely on just 1 station
  - NOAA performs grid calculations

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## Area-based coverage: find your grid

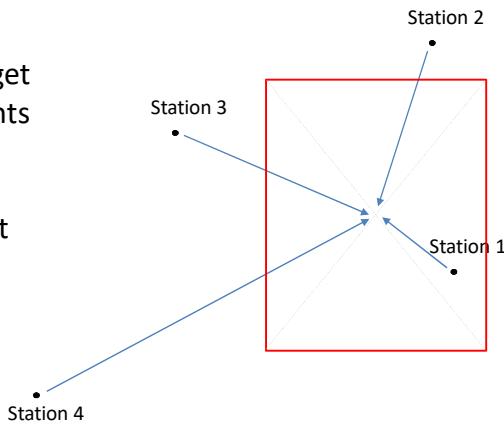
- 0.25 degrees longitude x 0.25 degrees latitude
- If your land lies in 2 adjacent grids, you can insure it in one or the other, or split it into both
- Only one composite rainfall value for entire grid



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## Precipitation amount weighted by distance from grid center

- Outcomes at closest stations get the largest weights
- Your location in the grid doesn't matter

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## PRF Insurance: coverage features

- Guarantee from 70% to 90% of normal precip
- Single peril: only insures precipitation
- Other perils aren't insured
  - Fire
  - Heat
  - Disease
  - Hail
  - Insects
  - Plant vigor



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## PRF Insurance: time periods

- Policy runs January to December
- Pick time periods you want to insure
  - at least two 2-month intervals (no overlap)
  - allocate \$ coverage across selected intervals
  - maximum allocation of 60%, minimum of 10%



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## Sidebar: Annual Forage Rainfall Index coverage

- Similar insurance product is also available for annual forages
  - Crop's intended use is feed or fodder, including:
    - Grazing, haying, silage, green chop
    - Any other method that results in livestock feed
  - Uses same grid areas, rainfall values, etc.
  - 4 coverage periods, based on planting date



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## Online resources

- RMA info on PRF  
[www.rma.usda.gov/Policy-and-Procedure/Insurance-Plans/Pasture-Rangeland-Forage](http://www.rma.usda.gov/Policy-and-Procedure/Insurance-Plans/Pasture-Rangeland-Forage)
- Grid locator and Decision Support Tool  
<http://prodwebnlb.rma.usda.gov/apps/prf>



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RMA Insurance | Procedural Handbooks | RMA Local | Commodities | Tools | Topics

RMA Insurance / General Insurance Policies / Pasture, Rangeland, Forage

## Pasture, Rangeland, Forage

Pasture, Rangeland, and forages cover approximately 55 percent of all U.S. land. Forage grows differently in different areas, so it's important for farmers and ranchers to know which types and techniques work best for their region. The following insurance program is available for Pasture, Rangeland, and Forage (PRF). Also see [livestock](#) policies or [PRF NAP Table](#)

### News

- USDA Expands Forage Crop Insurance Option Nationwide for Livestock Producers (Aug 31, 2015)
- PM-17-049 - Rainfall Index and Vegetation Index Basic Provisions and Rainfall Index Pasture, Rangeland, Forage Crop Provisions Changes Effective for 2018 and Succeeding Crop Years (Aug 25, 2017)
- Pasture, Rangeland, Forage Pilot Insurance Program Fact Sheet
- Summary Overview of Rainfall Index Insurance plan for Pasture, Rangeland, and Forage
- Pasture, Rangeland, Forage FAQs
- Rainfall Index and Vegetation Index Pasture, Rangeland, and Forage General Program Overview
- Rainfall Index Pasture, Rangeland, and Forage Technology
- Rainfall Index and Vegetation Index Pasture, Rangeland, and Forage Shares
- Rainfall Index and Vegetation Index Pasture, Rangeland, and Forage Tools

### Rainfall Index

Based on weather data collected and maintained by NOAA's Climate Prediction Center. The index reflects how much precipitation is received relative to the long-term average for a specified area and timeframe.

- County Availability
- Basic Provisions (Aug 2017)
- Policy Provisions (Aug 2017)
- Insurance Standards Handbook (Aug 2017)
- Grid ID Locator, Decision Support Tool, Historical Indices

Show 10 entries Search:

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### Pasture, Rangeland, Forage Support Tool

Grid Locator | Historical Indexes | Decision Support Tool | Estimated Indemnities

Clear All | Zoom to Grid | Emporia, KS | ?

Current Location: Grid ID: 22036, Latitude: 38.40560°, Longitude: -96.18016°, County: Lyon, State: Kansas | Zoom to

Current Pin Information: Grid ID: 22036, Latitude: 38.40560°, Longitude: -96.18016°, County: Lyon, State: Kansas, Address: 650 Commercial St, Emporia, Kansas 66801

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Pasture, Rangeland, Forage Support Tool

Grid Locator Historical Indexes **Decision Support Tool** Estimated Indemnities

Location Information

State: Kansas County: Lyon Grid ID: 22036 OR Search By Grid ID: Enter Grid ID: Search

Protection Information

Intended Use: Grazing	Index Interval: Jan-Feb	Percent of Value (%): N/A	Policy Protection Per Unit: \$0	Premium Rate Per \$100: 23.73	Total Premium: \$0	Premium Subsidy: \$0	Producer Premium: \$0	Actual Index Value: 114.2	Estimated Indemnity: \$0
Irrigation Practice: Please Select	Feb-Mar	N/A	\$0	18.52	\$0	\$0	\$0	159.5	\$0
Organic Practice: Please Select	Mar-Apr	N/A	\$0	14.34	\$0	\$0	\$0	112.2	\$0
Coverage Level: 90%	Apr-May	N/A	\$0	12.71	\$0	\$0	\$0	61.9	\$0
Productivity Factor: 150%	May-Jun	60	\$37,689	12.88	\$4,885	\$2,492	\$2,393	39.1	\$21,486
Insurable Interest: 100%	Jun-Jul	N/A	\$0	17.52	\$0	\$0	\$0	29.3	\$0
Insured Acres: 1000	Jul-Aug	40	\$25,328	18.58	\$4,705	\$2,400	\$2,305	46.8	\$12,498
Sample Year: 2012	Aug-Sep	N/A	\$0	18.85	\$0	\$0	\$0	89.6	\$0
Policy Information	Sep-Oct	N/A	\$0	19.31	\$0	\$0	\$0	81.7	\$0
County Base Value: \$45.00	Oct-Nov	N/A	\$0	19.47	\$0	\$0	\$0	51.1	\$0
Dollar Amount of Protection: \$83.32	Nov-Dec	N/A	\$0	25.01	\$0	\$0	\$0	37.2	\$0
Total Insured Acres: 1,000	Per Acre	N/A	N/A	\$9.59	\$4.89	\$4.70	N/A	\$33.32	
Total Policy Protection: \$83,315	Total	1,000	\$63,315	N/A	\$8,591	\$4,891	\$4,699	N/A	\$33,923
Subsidy Level: 51.0%	Calculate								
Maximum Percent of Value per Index Interval: 80.0%	This tool is using insurance data from 2018. This tool is for illustration purposes only. Your actual information may differ.								

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## Use the Decision Support Tool to...

- Compare index intervals and coverage allocations
- Compare guarantee levels
- Estimate premium costs
- Evaluate PRF results for particular years
- Example: 1,000 acres of pasture

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**Protection Information**

Intended Use:	Grazing
Irrigation Practice:	Please Select
Organic Practice:	Please Select
Coverage Level:	90%
Productivity Factor:	150%
Insurable Interest:	100%
Insured Acres:	1000
Sample Year:	2012

**Intended Use:**  
- *haying or grazing*

**Coverage Level:**  
- *Rainfall index trigger*  
- *70% to 90%*

**Productivity Factor:**  
- *Adjust \$/acre*  
- *60% to 150%*

**Insurable interest:**  
- *100% = full ownership*

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**Policy Information**

County Base Value	\$27.00
Dollar Amount of Protection	\$36.45
Total Insured Acres	1,000
Total Policy Protection	\$36,450
Subsidy Level	51.0%
Maximum Percent of Value per Index Interval	60.0%

**County Base Value**  
= *base \$ value of production per acre; set by RMA*

**Dollar Amount of Protection**  
= *County Base Value*  
x *Productivity Factor %*  
x *Guarantee Level %*

**\$46.90 x 150% x 90% = \$63.32**

**Total Policy Protection**  
= *Dollar Amount of Protection*  
x *Total Insured Acres*

**\$63.32 x 1,000 = \$63,315**

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Protection Table	
Index Interval	Percent of Value (%)
Jan-Feb	N/A
Feb-Mar	N/A
Mar-Apr	N/A
Apr-May	N/A
May-Jun	60
Jun-Jul	N/A
Jul-Aug	40
Aug-Sep	N/A
Sep-Oct	N/A
Oct-Nov	N/A
Nov-Dec	N/A

**INDEX INTERVALS**

- *Time periods for which you insure rainfall*
- *Must choose at least two intervals*
- *Must allocate % of dollar coverage to each (max 60%, min 10%)*

**Which periods? What allocation?**

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Protection Table						
Index Interval	Percent of Value (%)	Policy Protection Per Unit	Premium Rate Per \$100	Total Premium	Premium Subsidy	Producer Premium
Jan-Feb	N/A	\$0	23.73	\$0	\$0	\$0
Feb-Mar	N/A	\$0	18.32	\$0	\$0	\$0
Mar-Apr	N/A	\$0	14.34	\$0	\$0	\$0
Apr-May	N/A	\$0	12.71	\$0	<b>51%</b>	<b>49%</b>
May-Jun	60	\$37,989	X 12.86 % =	\$4,885	\$2,492	\$2,393
Jun-Jul	N/A	\$0	17.52	\$0	\$0	\$0
Jul-Aug	40	\$25,326	X 18.58 % =	\$4,706	\$2,400	\$2,306
Aug-Sep	N/A	\$0	18.85	\$0	\$0	\$0
Sep-Oct	N/A	\$0	19.31	\$0	\$0	\$0
Oct-Nov	N/A	\$0	19.47	\$0	\$0	\$0
Nov-Dec	N/A	\$0	25.01	\$0	\$0	\$0
Per Acre	N/A	N/A	N/A	\$9.59	\$4.89	\$4.70
Total	1,000	\$63,315	N/A	\$9,591	\$4,891	\$4,699

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Protection Table			Export to CSV		RESULTS FOR 2012	
Index Interval	Percent of Value (%)	Policy Protection Per Unit	Actual Index Value	Estimated Indemnity		
Jan-Feb	N/A	\$0	114.2	\$0	<b>Coverage level = 90%</b>	
Feb-Mar	N/A	\$0	159.5	\$0	<b>May-Jun:</b> <b>Actual Index = 39.1</b>	
Mar-Apr	N/A	\$0	112.2	\$0		
Apr-May	N/A	\$0	61.9	\$0	<b>Payment Factor =</b> $\frac{\text{Coverage level} - \text{Actual index}}{\text{Coverage level}}$	
May-Jun	60	\$37,989	39.1	\$21,485	$= \frac{(90 - 39.1)}{90} = .5656$	
Jun-Jul	N/A	\$0	29.3	\$0		
Jul-Aug	40	\$25,326	45.8	\$12,438	<b>Indemnity =</b> $\text{Payment Factor} \times \$ \text{ Policy Protection}$	
Aug-Sep	N/A	\$0	89.6	\$0	$= .5656 \times \$37,989$ $= \$21,485$	
Sep-Oct	N/A	\$0	81.7	\$0		
Oct-Nov	N/A	\$0	51.1	\$0		
Nov-Dec	N/A	\$0	37.2	\$0		
Per Acre	N/A	N/A	N/A	\$33.92		
Total	1,000	\$63,315	N/A	\$33,923	<b>KANSAS STATE</b> <b>UNIVERSITY</b>	

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## Insuring Haying Lands

- Perennial hay crops can be insured
  - Alfalfa
  - Grass hay meadows
  - Much higher \$\$\$ of protection per acre
- Irrigated or non-irrigated
  - Non-irrigated dollar coverage based on value of forage, like pasture
  - Irrigated dollar coverage based on additional cost of pumping needed to obtain ordinary production

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## The PRF decision...

- How accurately do the PRF indices reflect actual drought in my location? ("Will PRF pay when I have a loss?")
- Which index intervals and coverage allocations should I use? Which guarantee level and dollar amount per acre?
- Would PRF provide adequate funds to purchase replacement feed during bad years?

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## Do PRF index values reflect my own forage/rainfall experience?

- How well do the historic PRF rainfall indices track with my own forage production?
- How do the PRF indices track with rainfall or drought in my county?

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**Counting Drought Years:  
U.S. Drought Monitor classifications**

D0	Abnormally Dry
D1	Moderate Drought
D2	Severe Drought
D3	Extreme Drought
D4	Exceptional Drought

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**Which years? How bad?  
Lyon County, KS, outcomes, 2000-2018**

From May 1 to October 31, number of weeks in\* ...

YEAR	D2	D3	D4
2018	23	17	5
2014	9	5	--
2012	21	16	8
2011	14	4	--
2003	1+ ?	1	--

\*Criteria for payment under the Livestock Forage Disaster Program (LFP)  
Source: U.S. Drought Monitor

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Check the historical indices for your grid.  
 How well does the index reflect your experience?  
 Would PRF have helped you in the bad years?

Year	Jan-Feb	Feb-Mar	Mar-Apr	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec	Export to CSV
2018	***	72.9	83.8	68.2	79.7	70.4	50.2	132.4	149.4	N/A	N/A	
2017	80.7	129.3	177.9	118.9	84.0	63.8	107.1	129.3	90.3	81.3	13.3	
2016	59.6	68.9	150.5	171.6	81.3	76.4	152.1	194.8	145.1	32.9	38.6	
2015	75.8	63.6	87.3	184.1	130.6	88.4	118.0	68.6	38.2	111.2	231.9	
2014	**	47.0	35.7	34.5	65.2	108.6	86.9	57.6	115.8	125.6	71.7	69.6
2013	146.4	124.1	97.4	97.6	59.0	68.6	124.5	107.3	107.3	111.6	45.8	
2012	***	114.2	159.5	112.2	61.9	39.1	29.3	45.8	89.6	81.7	51.1	37.2
2011	157.3	114.1	57.8	78.5	66.8	42.6	46.1	52.1	51.4	123.2	248.4	
2010	94.7	107.3	124.1	126.0	104.6	127.4	115.0	115.0	113.6	48.1	45.1	
2009	39.6	133.4	207.0	142.1	122.9	130.4	124.4	149.2	158.5	155.5	84.8	
2008	121.7	134.1	105.2	118.4	140.6	130.5	131.2	175.8	160.8	97.7	94.0	
2007	169.2	164.8	126.3	136.0	164.4	135.9	56.8	38.4	122.0	122.2	96.5	
2006	5.6	73.9	119.5	111.4	65.4	54.0	80.3	59.8	56.2	74.3	114.0	
2005	238.4	84.4	44.6	93.0	147.9	158.6	168.8	121.1	53.5	68.2	64.7	
2004	133.5	164.7	128.4	69.8	105.6	153.6	122.1	49.0	64.1	125.1	115.0	
2003	*	74.8	97.0	123.8	104.6	74.7	46.2	89.3	139.4	88.0	56.6	95.7
2002	103.1	39.3	92.5	133.6	100.3	57.2	65.8	66.6	132.3	165.3	22.2	
2001	216.7	126.8	47.1	57.7	126.8	120.5	66.5	85.0	78.1	44.8	23.7	
2000	117.2	134.3	59.4	47.5	71.3	57.9	26.2	31.6	81.3	121.6	93.8	

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## Index intervals? Allocation?

- How does precipitation timing affect pasture production?
  - Precipitation during growing season is strongest predictor of forage output
  - Soil moisture profile at start of growing season
  - Plant vigor from previous growing season
  - Pasture composition: warm season vs. cool season
- Risk management: we want insurance that pays when we have a loss

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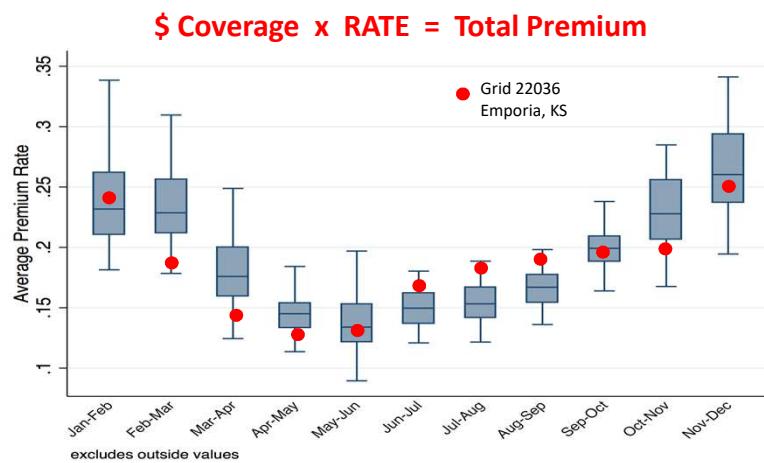
## Index intervals? Allocation?

- Premium cost:
  - Reflects frequency and severity of loss
  - Which intervals have lower premiums?

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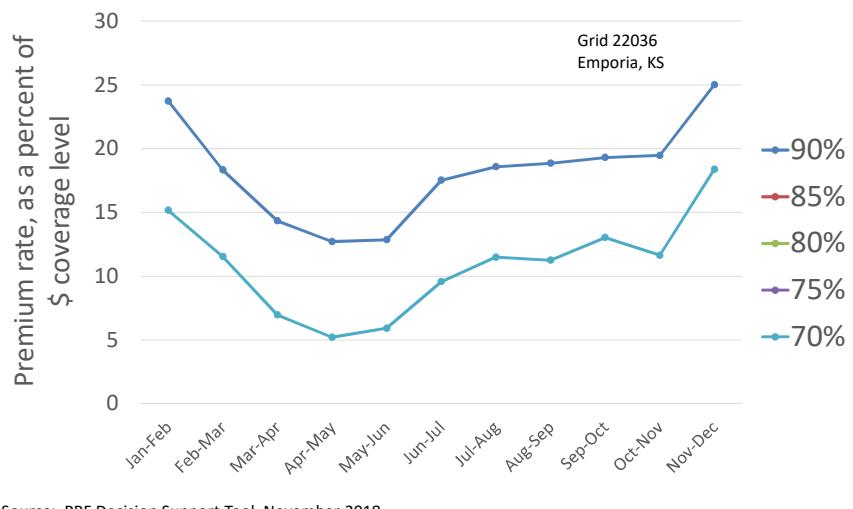
Premium rates, by index interval, 90% guarantee, values across all KS and NE grids



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## Premium rates vary by interval and coverage level

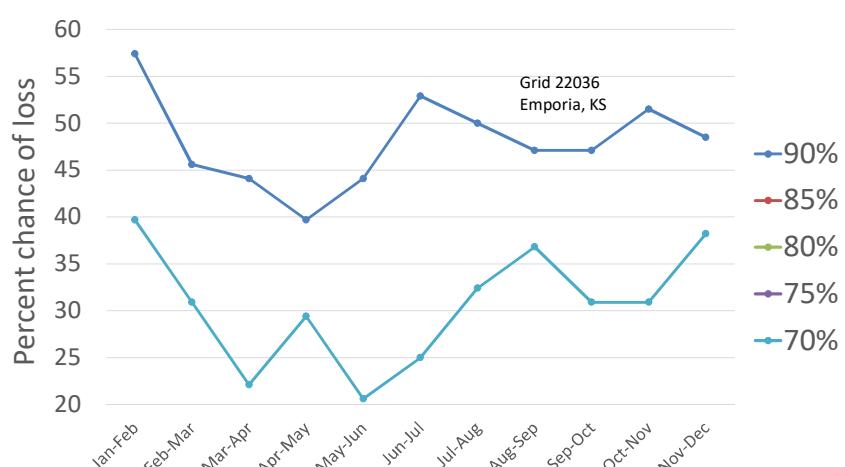


Source: PRF Decision Support Tool, November 2018

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## Probability of loss, 1948 to 2017



Source: PRF Decision Support Tool, November 2018

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## Strategies used....

- ***Cover the growing season***
  - Use 2 or 3 intervals for the warmer months
- ***Cover your premium / maximize chance of collecting***
  - Put coverage in all (or nearly all) months
- ***Big money***
  - Mainly insure the winter months
  - Best chance for a big payout



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## How much feed could I buy?

Insurance indemnity	\$33,923			
No. of acres	1,000			
Stocking rate: acres/head	6			
No. of head	167			
Daily lbs consumed / head	30			
Hay price per ton	\$75	\$100	\$125	\$150
Tons of hay purchased	452.3	339.2	271.4	226.2
Days of feed for herd	181	136	109	90



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## Long-term perspective on PRF

- Most KS locations will have good protection in widespread drought, may have hit-or-miss experience in spotty years
- Will come out ahead in long run due to premium subsidy
  - Most grids: about \$1.50 - \$2.00 back for every \$1.00 paid in

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## Use the Decision Support Tool to evaluate your options

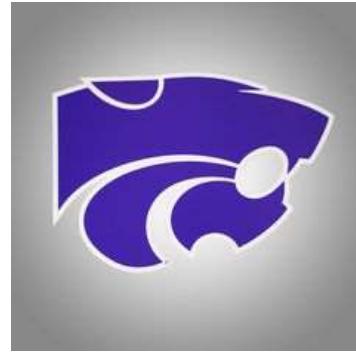
- Compare your experience with the historical indices
- Compare coverage options
- Consider \$\$ needed for replacement feed
- **November 15 is sales deadline**

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**Questions?**  
**Comments?**  
**Thank you!**

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