Insurance Options for Cow-Calf Producers

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2021 KSU Agricultural Lenders Conference

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Outline

- Background
- Limited-use policies
- PRF overview and participation trends
  - Self insurance comparison - intro
- LRP overview
- LRP analysis: historic performance, indemnity experience, expected vs actual intro

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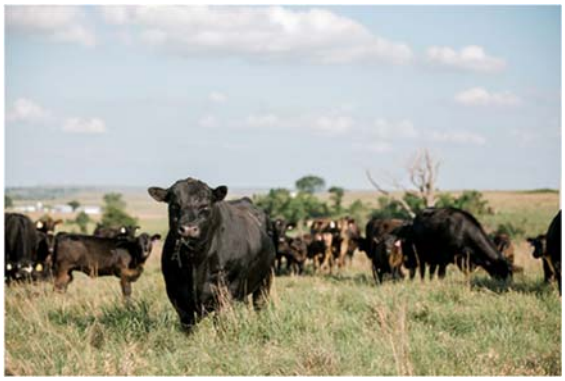
Summary

- Many insurance options for cow-calf producers, most protect against feed/forage price risk and market price risk
- Many options are "index based"
- LRP – Livestock Risk Protection – has been improving and may be worth consideration for feeder cattle

Why formally insure?

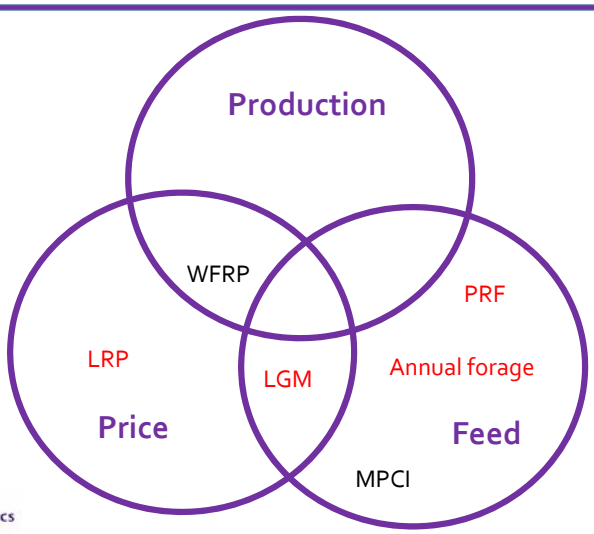
- Loan access / repayment
- Vulnerability to drought
- Protect operation during herd expansion
- Implicit (or explicit cost) of self insurance is increasing
- Federal insurance options are becoming more favorable



https://www.ksre.k-state.edu/news/stories/2021/01/beef-cattle-winter-ranch-management-series.html

Cow-calf insurance options by type of risk

Production Risk:
Events such as disease or weather that can lead to a decline in production/weight gain or mortality
Price Risk
Market price might drop, even to the point of not covering the cost of production
Feed Risk
If crop/forage yield decreases, feed may become expensive or difficult to purchase



Policies in red are never triggered by farm-specific losses. This can have some advantages but basis risk may be an issue

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Background

- Cattle production is larger than crop production in KS based on sales $$$, but insurance use is limited
- **Limited use**: WFRP, LGM
- **Moderate use**: PRF, Annual Forage, LRP
- **High use**: MPCI

https://agmanager.info/crop-insurance/crop-insurance-papers-and-information/livestock-insurance-and-lrp

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Source: USDA Economic Research Service

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LGM Summary

- Insures livestock (meat/milk) price-feed gross margin
- Relatively simple, index-policy based on futures prices
- Was used heavily in 2011 by KS dairy farms, other livestock use very limited

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WFRP-Whole Farm Revenue Protection

- Insures **all** farm revenue with up to $2 million in livestock revenue
- Works best for (somewhat) diversified, smaller operations
- Tax records required
- High initial time investment in writing WFRP polices
- Available but limited use in KS
- For more information:

https://www.sedgwick.k-state.edu/gardening-lawn-care/fruits-vegetables-nuts/vegetable-gardening.html

https://www.agmanager.info/sites/default/files/pdf/RMA_WFRP_Slides_2.pdf
https://www.rma.usda.gov/en/Fact-Sheets/National-Fact-Sheets/Whole-Farm-Revenue-Protection-2020

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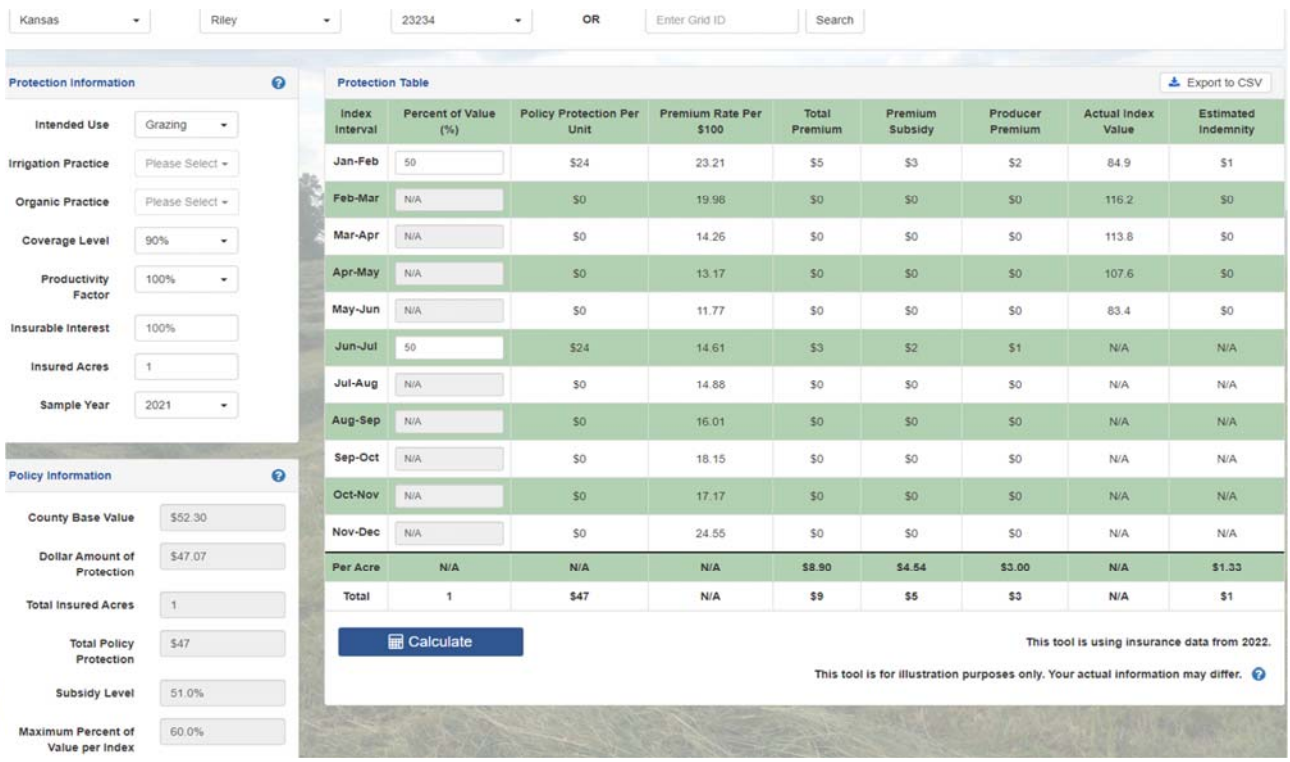
Pasture, Rangeland, and Forage Insurance

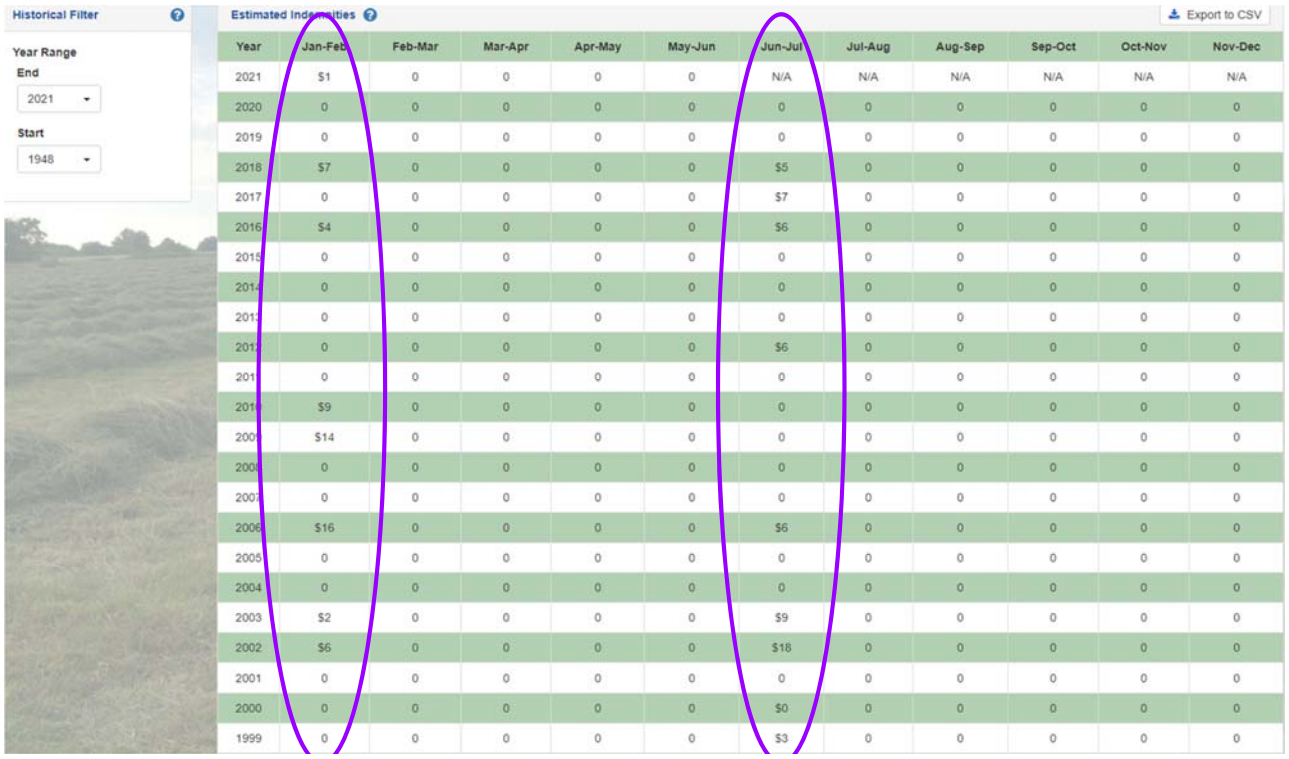
- USDA tracks precipitation in an area (grid), and **sends payments automatically**
  - Payments triggered by **lack of precipitation (rain or snow)** relative to historic levels
- Important considerations
  - *There can be low rainfall in a producer's fields but if grid rainfall levels are different, there may not be an indemnity*
  - Producers must insure at least 2, 2-month intervals: summer months typically correspond with higher rainfall-related risk (May-July), winter months tend to have higher indemnities
  - Grid selection is critical for many operations: discuss with an agent!

Pasture, Rangeland, and Forage Insurance decisions

- Designed so the producer comes out ahead in the long run
  - Historically, would have returned at least $1.45 per acre based on historic rainfall depending on the coverage level
  - Vandeveer (2016)
- General principles (Cho and Brorsen 2021)
  - Used historical data
  - Reduce risk by selecting high coverage levels, lower productivity factor, spring and summer intervals
  - Maximize returns by selecting high coverage levels, high productivity factor, winter intervals
- Decision support tool: https://prodwebnlb.rma.usda.gov/apps/prf


Kansas
Riley
23234
OR
Enter Grid ID
Search
Protection Information
Intended Use
Grazing
Irrigation Practice
Please Select
Organic Practice
Please Select
Coverage Level
90%
Productivity Factor
100%
Insurable Interest
100%
Insured Acres
1
Sample Year
2021
Policy Information
County Base Value
$52.30
Dollar Amount of Protection
$47.07
Total Insured Acres
1
Total Policy Protection
$47
Subsidy Level
51.0%
Maximum Percent of Value per Index
60.0%
Protection Table
Export to CSV
Index Interval | Percent of Value (%) | Policy Protection Per Unit | Premium Rate Per $100 | Total Premium | Premium Subsidy | Producer Premium | Actual Index Value | Estimated Indemnity
Jan-Feb | 50 | $24 | 23.21 | $5 | $3 | $2 | 84.9 | $1
Feb-Mar | N/A | $0 | 19.98 | $0 | $0 | $0 | 116.2 | $0
Mar-Apr | N/A | $0 | 14.26 | $0 | $0 | $0 | 113.8 | $0
Apr-May | N/A | $0 | 13.17 | $0 | $0 | $0 | 107.6 | $0
May-Jun | N/A | $0 | 11.77 | $0 | $0 | $0 | 83.4 | $0
Jun-Jul | 50 | $24 | 14.61 | $3 | $2 | $1 | N/A | N/A
Jul-Aug | N/A | $0 | 14.88 | $0 | $0 | $0 | N/A | N/A
Aug-Sep | N/A | $0 | 16.01 | $0 | $0 | $0 | N/A | N/A
Sep-Oct | N/A | $0 | 18.15 | $0 | $0 | $0 | N/A | N/A
Oct-Nov | N/A | $0 | 17.17 | $0 | $0 | $0 | N/A | N/A
Nov-Dec | N/A | $0 | 24.55 | $0 | $0 | $0 | N/A | N/A
Per Acre | N/A | N/A | N/A | $8.90 | $4.54 | $3.00 | N/A | $1.33
Total | 1 | $47 | N/A | $9 | $5 | $3 | N/A | $1
Calculate
This tool is using insurance data from 2022.
This tool is for illustration purposes only. Your actual information may differ.


Kansas
Riley
23234
OR
Enter Grid ID
Search
Historical Filter
Year Range
End
2021
Start
1948
Index Values - Percent of Normal
Export to CSV
Year | Jan-Feb | Feb-Mar | Mar-Apr | Apr-May | May-Jun | Jun-Jul | Jul-Aug | Aug-Sep | Sep-Oct | Oct-Nov | Nov-Dec
2021 | 84.9 | 116.2 | 113.8 | 107.6 | 83.4 | N/A | N/A | N/A | N/A | N/A | N/A
2020 | 121.5 | 110.1 | 115.6 | 115.5 | 92.9 | 114.7 | 115.6 | 49.8 | 38.5 | 83.6 | 152.7
2019 | 153.2 | 151.7 | 105.2 | 196.2 | 194.1 | 112.4 | 192.2 | 232.2 | 153.7 | 110.8 | 85.3
2018 | 62.9 | 46.8 | 52.4 | 75.8 | 74.9 | 71.2 | 115.0 | 180.0 | 223.4 | 183.1 | 189.7
2017 | 146.8 | 150.2 | 186.4 | 128.8 | 87.0 | 62.5 | 87.2 | 92.7 | 80.7 | 84.4 | 11.8
2016 | 75.6 | 33.3 | 152.6 | 185.7 | 79.4 | 67.8 | 128.0 | 152.7 | 144.7 | 86.0 | 81.8
2015 | 90.1 | 53.0 | 62.5 | 144.4 | 161.8 | 138.9 | 109.9 | 99.7 | 74.1 | 134.9 | 340.0
2014 | 104.1 | 64.5 | 86.4 | 84.8 | 104.0 | 97.6 | 64.9 | 83.1 | 101.0 | 94.2 | 70.1
2013 | 127.2 | 80.4 | 115.8 | 134.5 | 108.0 | 112.1 | 112.9 | 105.8 | 150.4 | 139.1 | 50.8
2012 | 110.5 | 137.5 | 124.2 | 70.7 | 69.4 | 68.0 | 72.0 | 91.0 | 52.2 | 56.6 | 63.0
2011 | 92.3 | 67.1 | 81.2 | 105.6 | 113.6 | 103.8 | 104.7 | 83.3 | 58.1 | 143.1 | 279.3
2010 | 54.2 | 121.5 | 129.4 | 94.7 | 119.0 | 126.3 | 88.8 | 98.4 | 85.2 | 82.8 | 92.7
2009 | 36.7 | 110.7 | 154.7 | 88.0 | 96.3 | 146.6 | 136.3 | 106.3 | 109.1 | 139.3 | 155.9
2008 | 101.9 | 152.4 | 118.5 | 90.4 | 121.6 | 133.1 | 132.4 | 157.9 | 143.1 | 110.8 | 77.5
2007 | 130.8 | 163.6 | 128.7 | 197.3 | 172.9 | 102.0 | 101.8 | 81.8 | 132.3 | 140.1 | 136.8
2006 | 27.2 | 70.4 | 104.8 | 79.6 | 53.0 | 67.2 | 122.3 | 119.1 | 84.4 | 59.3 | 72.1
2005 | 227.4 | 116.4 | 73.4 | 74.8 | 135.2 | 146.6 | 119.8 | 143.9 | 121.3 | 103.0 | 73.5
2004 | 163.9 | 224.2 | 135.1 | 74.5 | 106.6 | 137.9 | 116.4 | 63.5 | 41.0 | 73.9 | 91.7
2003 | 81.3 | 82.7 | 119.8 | 90.4 | 66.2 | 56.7 | 51.8 | 68.7 | 64.0 | 76.9 | 84.9
2002 | 67.2 | 28.4 | 71.5 | 105.4 | 54.1 | 22.9 | 67.1 | 75.1 | 119.5 | 142.1 | 15.0
2001 | 272.9 | 172.8 | 96.2 | 108.1 | 110.8 | 102.2 | 107.4 | 131.0 | 100.9 | 52.0 | 41.7
2000 | 179.1 | 164.6 | 78.1 | 56.9 | 76.1 | 89.9 | 62.3 | 35.5 | 67.1 | 111.6 | 81.4



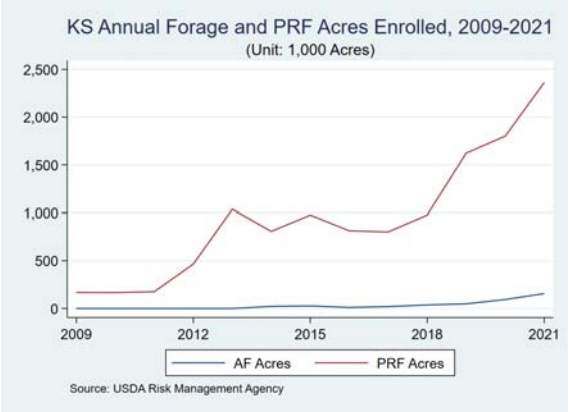
Year	Jan-Feb	Feb-Mar	Mar-Apr	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec
2021	$1	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
2020	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0
2018	$7	0	0	0	0	$5	0	0	0	0	0
2017	0	0	0	0	0	$7	0	0	0	0	0
2016	$4	0	0	0	0	$6	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	$6	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0
2010	$9	0	0	0	0	0	0	0	0	0	0
2009	$14	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0
2006	$16	0	0	0	0	$6	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0
2003	$2	0	0	0	0	$9	0	0	0	0	0
2002	$6	0	0	0	0	$18	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	$0	0	0	0	0	0
1999	0	0	0	0	0	$3	0	0	0	0	0

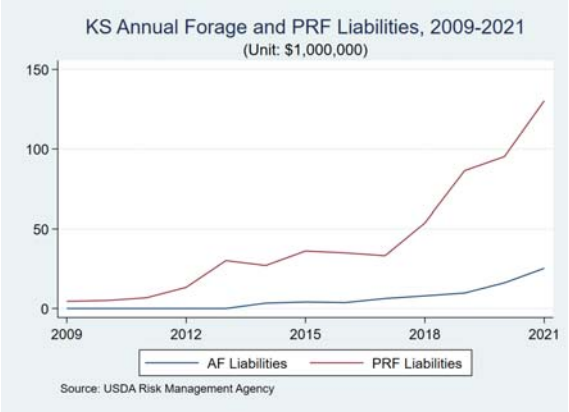
Annual Forage

- Covers annually planted acreage, used as feed and forage for livestock
- Indemnities are triggered by a rainfall index
  - Sub-state county base values calculated using methodology similar to PRF
- KS is eligible for "dual use" with small grains
- Participation
  - 2021: 153,670 acres with $24.6 million liabilities
  - 2020: 94,177 acres with > $16 million liabilities

https://www.southwest.k-state.edu/documents/2018-JohnHolman-Annual-Forages.pdf

PRF and AF use increased substantially in 2021





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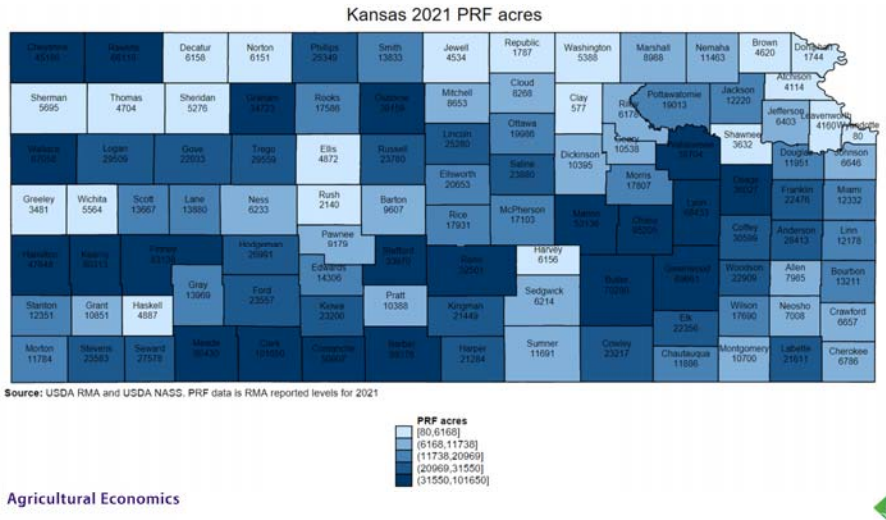
PRF acres enrolled in 2021



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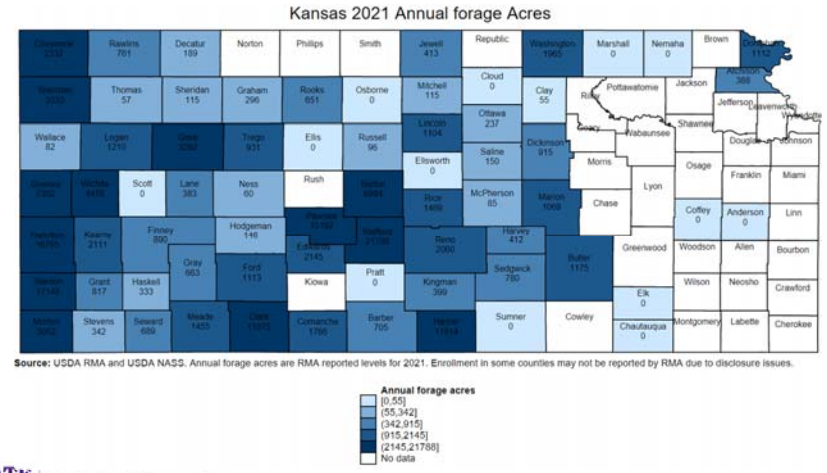
Annual Forage more common in western KS



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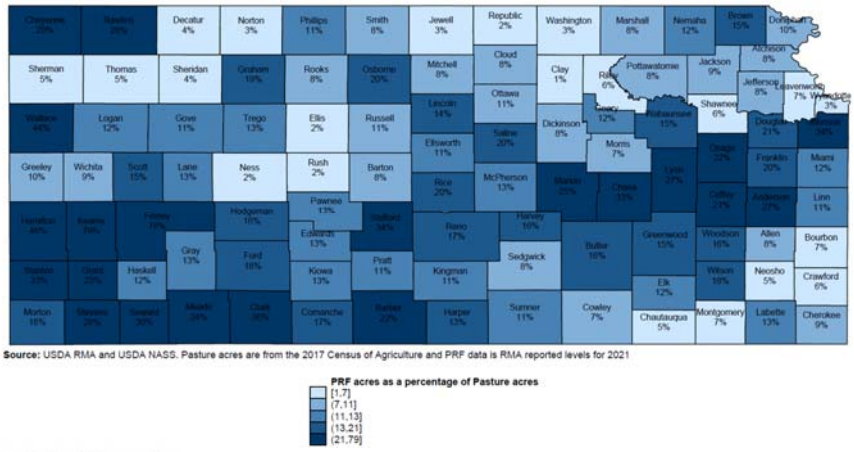
PRF acres equivalent to 20-40% of acreage in some counties



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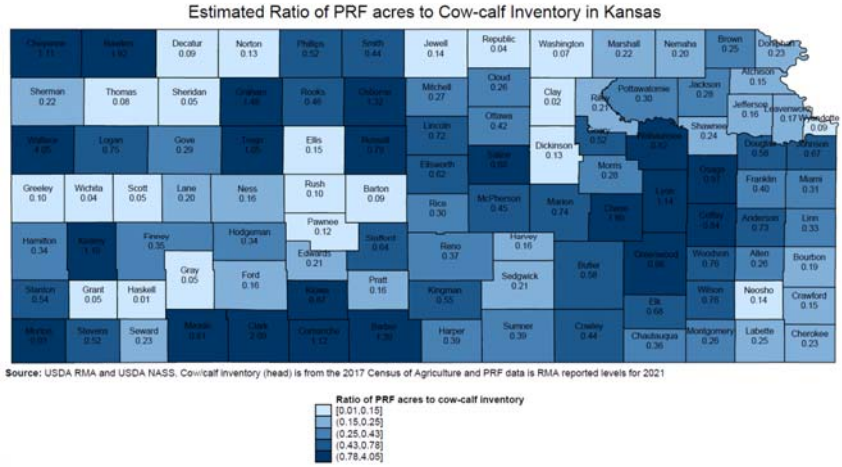
Ratio of PRF to cattle inventory implies similar patterns



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PRF vs self-insurance costs (introduction)

- Cost and yield of hay in Kansas (forage)
  - 2012 - $196 / ton, 1.65 tons per acre
  - 2015 - $106 / ton, 2.4 tons per acre
  - 2020 - $127 / ton, 2.28 tons per acre
- Approx. cost of 2021 PRF: (Hay, non-irrigated, non-organic, Washington County, grid 23433)
  - High coverage ~$15-20/acre
  - Medium coverage ~ $10-12/acre
  - Low coverage ~$5-$8
- 2021 Ag Manager non-irrigated alfalfa returns (Nov 2020), ~$200 / acre

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Estimated premium only, only an agent can quote actual premium
https://prodwebnlb.rma.usda.gov/apps/prf
Hay yield and price data from NASS, Agmanager.info

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PRF vs self-insurance costs (introduction)

- Most operations keep a buffer, about 1 month production (10% "opportunity cost" can be compared to PRF costs)
- Hay "inventory depreciation"
  - Alfalfa hay from "premium" to "fair" could lose $100 / ton value
- Important considerations
  - Opportunity cost of selling cows/calves in response to drought
  - Opportunity cost of (often-implicit) lower stocking rates
  - Future work….

Livestock Risk Protection (LRP)

- Protects against declines in (expected) market prices
- CME index for feeder cattle prices and AMS for fed cattle
- First apply for the policy (one time), then select an endorsement
- Premiums depend on expected final market prices of livestock, change frequently

LRP works like a PUT, but cheaper

Selling October feeder cattle

Futures price ~$170/cwt

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Note: based on https://agmanager.info/k-state-feeder-cattle-risk-management-tool, assumes basis = 0

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LRP improved in 2020

- For feeder cattle, fed cattle, swine
- Increased premium subsidy
- Increased head limits
  - For cattle up to 6000 per endorsement, 12,000 annually (likely will go higher in 2022)
  - Modifying ownership requirements for last 60 days
  - Unborn livestock can be insured

Coverage Level (Percent)	Previous Subsidy Rate (Percent)	Revised Subsidy Rate (Percent)
95-100	25	35
90-94.99	30	40
85-89.99	35	45
80-84.99	35	50
70-79.99	35	55

https://www.rma.usda.gov/News-Room/Press/Press-Releases/2020-News/USDA-Announces-Increased-Subsidies-and-Other-Improvements-to-the-LRP-Program

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LRP details

- Purchase in state where cattle are located
- Length of endorsement
  - 13-52 weeks, at 4-5 week intervals
- Coverage level (70-100)
- Head, type of cattle, weight
  - Feeder: under 600 and 600-900
  - Fed: 1000-1400

•File for indemnity within 60 days, cannot sell cattle more than 60 days before end of coverage period (without approval)
  - But not required to sell by end of coverage period

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Representative farm & LRP policy

Representative Farm

- Cow-calf operation in Kansas
- Normally calves 83 head of steers
- Target Weight: 600lbs (6.0cwt)
- No/little backgrounding

Representative Policy

- LRP Policy
- Begins April 1st
- Ends October 28th
- Expected to sell through October
- 30-week endorsement
- Percentage Covered 95.59%

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In-depth example: cost changes

Subsidy Rate	13%	25%	35%
Expected Ending Value	166.17	166.17	166.17
Head Count	50	50	50
Weight	6	6	6
Coverage Level	0.94	0.94	0.94
Insured Value	49851	49851	49851
Rate	0.017	0.017	0.017
Total Premium	847.47	847.47	847.47
Farmers Premium	737.30	635.60	550.85
Farmers Cost	2.46	2.12	1.84

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Representative farm comes out ahead with LRP over time (as designed)

Historical Performance of representative farm from 2007-2021

Risk Management Outcomes		
Measure	Average Per Cwt	Average Per Head
Expected Ending Value	$166.17	$997.02
Actual Ending Value	$161.97	$971.79
Producer Premium	$3.30	$19.79
Gross Indemnity	$6.83	$40.96
Net Indemnity	$3.53	$21.17
Return on Producer Premium		107%

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Estimated using *Understanding Data and Markets* tool developed by Bozic, LLC

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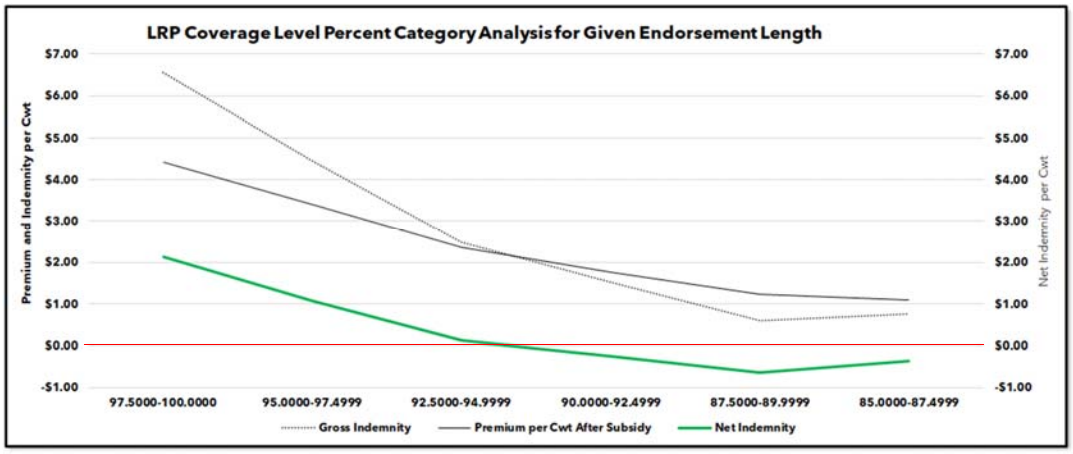
Historically, both premium and indemnities increase with coverage (30 week endorsement)



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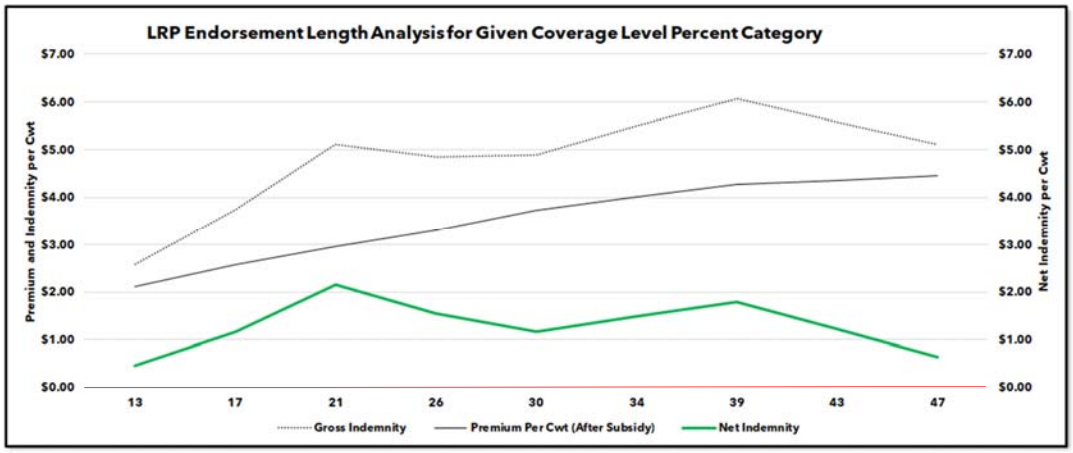
Historic premium increases with endorsement length, indemnities mixed (95% coverage)



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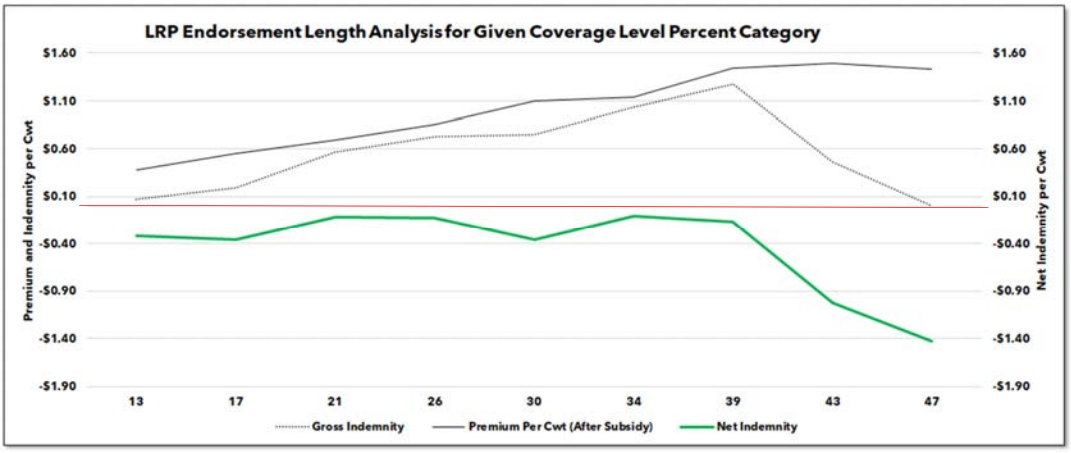
Lower coverage levels cost less, but lower net indemnities (87%)



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Cost vs risk reduction tradeoffs

Crop Year	Exp. End Value	Coverage Price	Coverage Level	Rate	Cost Per CWT	Producer Premium Per CWT
2021	154.674	$154.670	1.000000	0.038372	5.935	3.86
2021	154.674	$152.670	0.987000	0.031630	4.829	3.14
2021	154.674	$150.670	0.974100	0.025957	3.911	2.54
2021	154.674	$148.670	0.961200	0.020993	3.121	2.03
2021	154.674	$146.670	0.948300	0.016881	2.476	1.49
2021	154.674	$144.670	0.935300	0.013410	1.940	1.16

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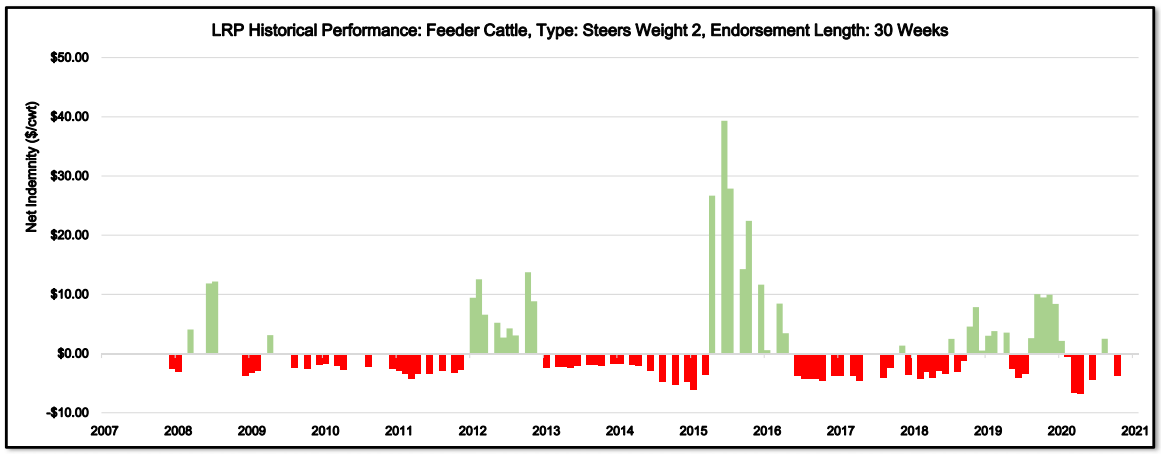
With 95% coverage, over half the time you pay up to $5/cwt, indemnities concentrated



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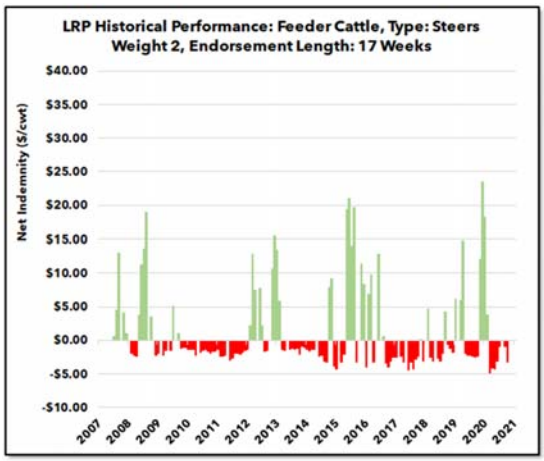
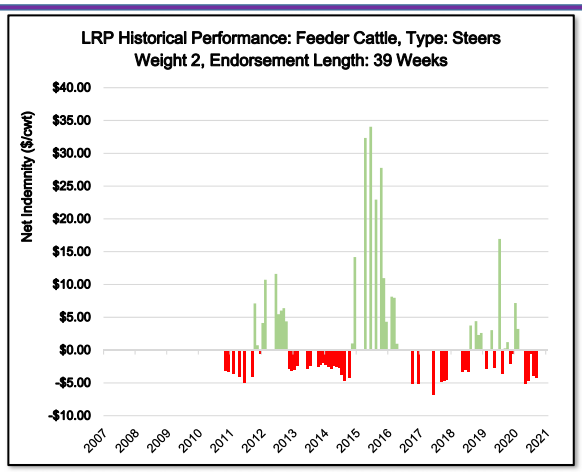
Similar frequent of payouts with different endorsement lengths





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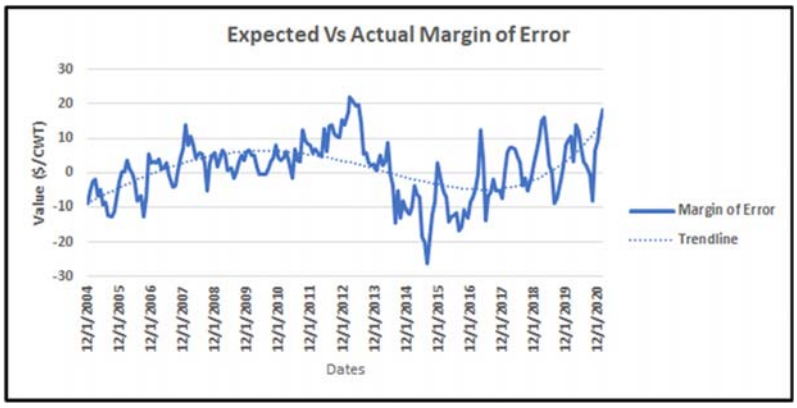
Expected minus actual price increasing in volatility



Greater than zero implies potential for LRP indemnity

Estimated using *Understanding Data and Markets* tool developed by Bozic, LLC

LRP: The bottom line

- Policy is now more favorable
- The highest coverage policies provide the highest protection and return over time with frequent indemnities, but costs can easily go to $5/cwt for feeders
- The lowest coverage policies rarely, if ever, pay indemnities, but cost is negligible – similar to MPCI CAT
- "In between" options balance cost and protection
  - Around 89%, about $1/cwt (varies), rarely pays but sizeable indemnities during bad years
  - Around 95%, about $1.50/cwt-$2/cwt (varies), pays out around 4 out 10 years

Conclusion

- Many insurance options for cow-calf producers to manage forage and price risk
- In current environment, may be worth reconsidering these options
- PRF/annual forage and LRP – current focus
- Future research and outreach
  - PRF: comparison to self-insurance
  - LRP expected vs actual analysis
  - LRP Scenario analysis – producer focused

Resources

https://www.agmanager.info/crop-insurance

https://www.rma.usda.gov/Policy-and-Procedure/Insurance-Plans/Livestock-Insurance-Plans

https://www.agmanager.info/livestock-meat/livestock-marketing-charts/

https://agmanager.info/2020-risk-and-profit-conference-presentations/hedging-kansas-live-cattle-summary-outcomes-over-past

https://agmanager.info/k-state-feeder-cattle-risk-management-tool

Vintage LRP:

https://agmanager.info/livestock-meat/comparing-lrp-put-option

https://agmanager.info/livestock-meat/lrp-basis-understanding-basics

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PRF Resources

- https://agmanager.info/events/risk-and-profit-conference/2016-risk-and-profit-conference-presentations/pasture-rangeland
- https://agmanager.info/events/risk-and-profit-conference/previous-conference-proceedings/2017-risk-and-profit-conference/17
- https://agmanager.info/crop-insurance/risk-management-strategies/dual-use-option-annual-forage-rainfall-insurance-and
- https://www.rma.usda.gov/en/News-Room/Frequently-Asked-Questions/Pasture-Rangeland-Forage
- https://extension.missouri.edu/publications/g457
- https://extension.okstate.edu/fact-sheets/evaluation-of-rainfall-index-pasture-rangeland-and-forage-crop-insurance-program-and-guidelines-for-producers.html

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Questions?
Comments?
Thank you!

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