Insurance Options for Cow-Calf Producers

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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





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



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-insurancepapers-and-information/livestock-insurance-and-lrp



Source: USDA Economic Research Service



LGM Summary

- Insures livestock (meat/milk) pricefeed 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

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• For more information:

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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

Pasture, Rangeland, and Forage Insurance

- USDA tracks precipitation in an area (grid), and **sends payments automatically** when levels are below guarantee
 - Payments triggered by lack of precipitation (rain or snow) relative to historic levels
- Important considerations
 - If you experience low rainfall in your fields but the grid rainfall levels are different, there is a chance you may not receive 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!

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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)
 - 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: <u>https://prodwebnlb.rma.usda.gov/apps/prf</u>

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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

| Cheyenne 45186 | | wlins i118 | Decatur 6158 | Norton 6151 | Phillips 25349 | Smith 13833 | Jewell 4534 | Republic 1787 | Washingto 5388 | on Mars 898 | | | | |
|-------------------|------------------|-----------------|------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------------|--------------------|-----------------|----------------------|---------------------|-------------------|---|
| Sherman 5695 | | omas 704 | Sheridan 5276 | Graham 34723 | Rooks 17586 | Osborne 39159 | Mitchell 8653 | Cloud 8268 Ottawa | Clay 577 | Rilly 6178 | ottawatomie 19013 | Jackson 12220 | 4114 V | enwolth 160W yda odo <u>tte</u> |
| Wallace 67058 | Loga 2950 | | Gove 22033 | Trego 29559 | Ellis 4872 | Russell 23780 | Lincoln 25280 Ellsworth | 19986 Saline | Dickinson 10395 | 4 | Wabaunsee 38704 | Shawnee 3632 | Douglas 11951 | 80 |
| Greeley 3481 | Wichita 5564 | Scott 13667 | Lane 13880 | Ness 6233 | Rush 2140 | Barton 9607 | 20653 Rice | 23880 McPherson | Marion | Morris 17807 | Lyon 68433 | Osage 36027 | Franklin 22476 | Miami 12332 |
| Hamilton | Kearny | Finr 831 | | Hodgeman 26991 | Pawnee 9179 | Stafford 33970 | 17931 Reno | 17103 Harve 615 | 53136 ey | Chase 95205 | | Coffey 30599 | Anderson 28413 | Linn 12178 |
| 47648 | 80313 |] | Gray 13969 | Ford 23557 | Edwards 14306 | Pratt | 32501 | Sedgwi | ick | Butler 70280 | | Woodson 22909 | Allen 7985 | Bourbon 13211 |
| Stanton 12351 | Grant 10851 | Haskell 4887 | | | Kiowa 23200 | 10388 | Kingman 21449 | 6214 | | | Elk 22356 | Wilson 17690 | Neosho 7008 | Crawford 6657 |
| Morton 11784 | Stevens 23583 | Seward 27578 | Meade 60430 | Clark 101650 | | | Harper 21284 | Sumne 11691 | er (| Cowley 23217 | Chautauqua 11886 | Montgomery 10700 | Labette 21611 | Cherokee 6786 |

Kansas 2021 PRF acres

Source: USDA RMA and USDA NASS. PRF data is RMA reported levels for 2021







Annual Forage more common in western KS

| | | | | | | | | <u> </u> | | _ | | | | |
|-----------------|-----------------|----------------|-----------------|-----------------|------------------------------------|-------------------|------------------------------|----------------------|--------------------|-------------|----------------|--------------|------------------|----------|
| | Rav 7 | wlins 61 | Decatur 189 | Norton | Phillips | Smith | Jewell 413 | Republic | Washington 1965 | Marsha 0 | I Nema 0 | | Vn Dompt 1112 | |
| | | omas 57 | Sheridan 115 | Graham 296 | Rooks 651 | Osborne 0 | Mitchell 115 | Cloud 0 Ottawa | Clay 55 | Riley | watomie | Jackson | Atchison 388 | enworth |
| Wallace 82 | Loga 1210 | in O | Gove 3292 | Trego 931 | Ellis 0 | Russell 96 | Lincoln 1104 Ellsworth | 237 Saline 150 | Dickinson 1 915 | | Wabaunsee | Shawnee | \sim -1 | Johnson |
| Greeley 7302 | Wichita 4478 | Scott 0 | Lane 383 | Ness 60 | Rush | Barton 6984 | 0 Rice 1469 | McPherson 85 | Marion 1069 | Chase | Lyon | Coffey | Franklin | Miami |
| | Kearny 2111 | Finn 89 | | Hodgeman 146 | Pawnee 15192 Edwards 2145 | Stafford 21788 | Reno 2060 | Harve 412 | Bu | itler | Greenwood | 0 Woodson | 0 Allen | Bourbon |
| | Grant 817 | Haskell 333 | 663 | Ford 1113 | Kiowa | Pratt 0 | Kingman 399 | Sedgwi 780 | ick 11 | 175 | Elk 0 | Wilson | Neosho | Crawford |
| Morton 3052 | Stevens 342 | Seward 689 | Meade 1455 | Clark 11075 | Comanche 1766 | Barber 705 | Harper 11814 | Sumne 0 | er Cov | wley C | hautauqua 0 | Montgomery | Labette | Cherokee |

Kansas 2021 Annual forage Acres

Source: USDA RMA and USDA NASS. Annual forage acres are RMA reported levels for 2021. Enrollment in some counties may not be reported by RMA due to disclosure issues.

[0,55] (55,342] (342,915] (915,2145] (2145,21788] No data

Annual forage acres





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

| | | wlins 8% | Decatur 4% | Norton 3% | Phillips 11% | Smith 8% | Jewell 3% | Republic 2% | Washingtor 3% | Marsh 8% | all Nema 129 | | % 10% | |
|----------------|--------------|----------------|----------------|----------------|-----------------|-----------------|------------------|-------------------------|------------------|--------------|------------------|------------------|-----------------|---------------------------------------|
| Sherman 5% | | omas 5% | Sheridan 4% | Graham 19% | Rooks 8% | Osborne 20% | Mitchell 8% | Cloud 8% | Clay 1% | Rilley 6% | tawatomie 8% | Jackson 9% | Atchison 8% | enwolth |
| Wallace 44% | Loga 12% | an 6 | Gove 11% | Trego 13% | Ellis 2% | Russell 11% | Lincoln 14% | Ottawa 11% Saline | Dickinson 1 | Coary 12% | Wabaunsee 15% | Shawnee 6% | Bouglas 21% | 7% Wyondott 3% 7 Johnson 34% |
| Greeley | Wichita | Scott | Lane | Ness | Rush 2% | Barton | Ellsworth 11% | 20% | 8% | Morris 7% | Lyon | Osage 22% | Franklin 20% | Miami 12% |
| 10% | 9% | 15% | 13% | 2% Hodgeman | Pawnee 13% | 8% | Rice 20% | McPherson 13% | Marion 25% | Chase 33% | 27% | Coffey 21% | Anderson 27% | Linn 11% |
| | | | Gray | 16% Ford | Edwards 13% | Stafford 34% | Reno 17% | Harv 169 | 6 B | utler 16% | Greenwood 15% | Woodson 16% | Allen 8% | Bourbon 7% |
| | Grant 23% | Haskell 12% | 13% | 18% | Kiowa 13% | Pratt 11% | Kingman 11% | Sedgw 8% | | | Elk 12% | Wilson 18% | Neosho 5% | Crawford 6% |
| Morton 18% | | Seward 30% | Meade 24% | Clark 36% | Comanche 17% | Barber 22% | Harper 13% | Sumne 11% | | owley 7% | Chautauqua 5% | Montgomery 7% | Labette 13% | Cherokee 9% |

Estimated Ratio of PRF acres to Pasture acres in Kansas

Source: USDA RMA and USDA NASS. Pasture acres are from the 2017 Census of Agriculture and PRF data is RMA reported levels for 2021







Ratio of PRF to cattle inventory implies similar patterns



Estimated Ratio of PRF acres to Cow-calf Inventory in Kansas

Source: USDA RMA and USDA NASS. Cow/calf inventory (head) is from the 2017 Census of Agriculture and PRF data is RMA reported levels for 2021







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

KANSAS STATE UNIVERSITY Agricultural Economics 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



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....

KANSAS STATE UNIVERSITY Agricultural Economics Estimated premium only, only an agent can quote actual premium <u>https://prodwebnlb.rma.usda.gov/apps/prf</u> https://hayandforage.com/article-3614-USDA-Hay-Markets-%E2%80%93-August-17-2021.html



Livestock Risk Protection (LRP) review

- 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
- Purchase in state where cattle are located





LRP details

- 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 30 days before end of coverage period with approval
 - But not required to sell by end of coverage period

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LRP improved in 2021

- For feeder cattle, fed cattle, swine
- Increased premium subsidy
- Increased head limits
 - For cattle up to 6000 per endorsement, 12,000 annually
 - 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





Representative farm & LRP policy

Representative Farm

- Cow-calf operation in Kansas
- Normally calves 83 head of steers
- Target Weight: 6oolbs (6.ocwt)
- 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%







LRP works like a PUT, but cheaper



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Note: based on https://agmanager.info/k-state-feedercattle-risk-management-tool, assumes basis = o





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



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



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



KANSAS STATE Agricultural Economics Estimated us





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 |







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



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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 feeder
- 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

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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/hedgingkansas-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

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





Questions? Comments? Thank you!

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