

Beef cow Bid Price Calculator and PRF-Rainfall Insurance

Nolan County Beef Cattle Program
Roscoe ISD STEM Center
Roscoe, TX
May 25th, 2017

Organized by: Zach Wilcox, CEA-ANR,
Nolan County

Presented by: Bill Thompson,
Extension Economist,
San Angelo, TX



Tonight's Agenda

- Cow Bid Price Calculator
 - What is the maximum I should give for a cow in this current economic environment?
- PRF Rainfall Insurance
 - Another look at this **Valuable** management tool

Cow Bid Price Calculator

- I did a lot of this in 2013 and 2014
 - Prices and enthusiasm were both high
- This is just as critical now.
 - What can prices at these levels actually support.

NPV

- This whole question is a Net Present Value Analysis (NPV).
 - But it has a lot of moving parts
 - Garbage in – Garbage out
 - Circa 1983, my first Computer class
 - TRS-80 – TRS=Tandy Radio Shack



Concept of Analysis

- Yr 0: We buy an income producing asset.
 - Yr 1:

We incur costs	-\$
<u>We sell products</u>	+\$
Net Income	±\$
 - Yr 2: “ “
 - Yr 3: “ “
 - i
 - Yr X:

We incur costs	-\$
We sell products	+\$
<u>We sell used asset</u>	+\$
Net Income	±\$
- Each of these net cash flows needs to be discounted to Yr 0

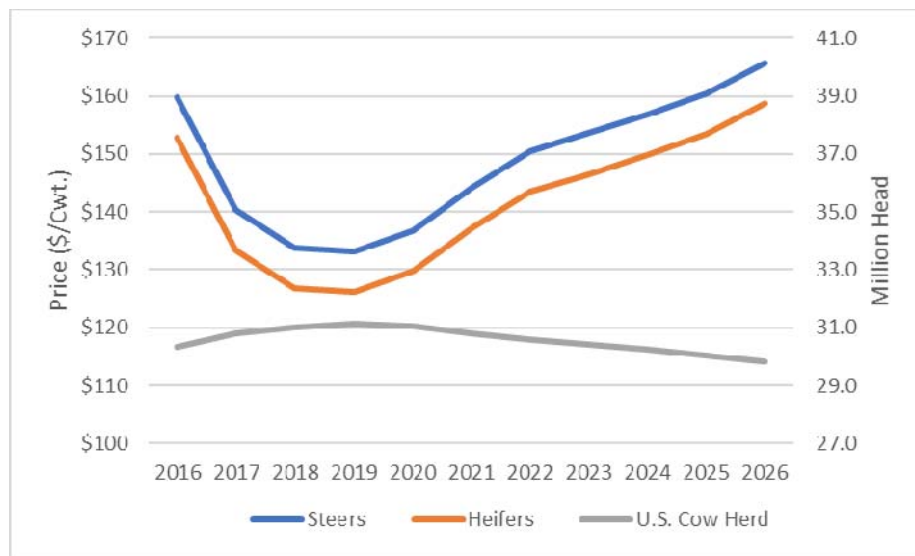
Concept of Analysis

- We discount Yr 1 through Yr X back to Yr 0 (Current Year).
- If the Sum of those discounted cash flows is greater than the cost of the asset, we made a good investment.
 - Pretty straight forward to analyze a purchased asset (In theory).

Key Data

- Estimates of weaned calf weights
 - Assume normal weather
- Estimates of calf prices several years into the future.
 - We don't know what prices are going to be this October, let alone Oct. '22
 - By using a spread sheet we can look at multiple scenarios relatively easy.

My Projections: 500-550 TX Calves



Cow Bid Calculator Excel Spreadsheet

Bid Price for Beef Cows Including Financing and Tax Implications			
Steer Weight (Pounds)	550	Cull Cow Sale Weight (Pounds)	1,075 Lb.
Heifer Weight (Pounds)	520	Marginal Income Tax Rate	15.00%
Cow Price (\$/Head)	\$1,100	Capital Gains Tax Rate	10.00%
Expected Number of Calving Opportunities	7	Self Employment Tax Rate	7.65%
		Discount Rate	3.00%

Cow Bid Calculator Excel Spreadsheet

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7				
Calf Crop or Weaning %	97	84	84	84	84	84	84	84	84	84	84
Steers Price (\$/Cwt)	140.45	133.74	133.13	136.75	144.10	150.58	153.57	156.83	160.48	165.82	165.82
Heifer Price (\$/Cwt)	133.45	126.74	126.13	129.75	137.10	143.58	146.57	149.83	153.48	158.82	158.82
Cull Cow Price (\$/Cwt)	\$73.01	\$69.86	\$69.57	\$71.27	\$74.73	\$77.77	\$79.18	\$80.71	\$82.43	\$84.93	\$84.93
Gross Receipts (Calf Sales)	\$714	\$588	\$586	\$602	\$635	\$664	\$678	\$693	\$709	\$733	\$733
Cow Operating Cost/Year	400	\$621	\$627	\$633	\$640	\$646	\$653	\$659	\$666	\$672	\$547
Net Above Operating Cost	\$314	(\$33)	(\$41)	(\$31)	(\$5)	\$18	\$25	\$34	\$43	\$61	\$186

Cow Bid Calculator Excel Spreadsheet

Cash Flows											Net Present Value	
Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7					
(\$440.00)	\$172.49	(\$93.54)	(\$101.09)	(\$93.42)	(\$71.38)	(\$69.33)	\$586.77	\$0.00	\$0.00	\$0.00	\$0.00	(\$135.62)

Comments regarding this investment scenario.

The negative net present value indicates that the price of \$1100 per head is too high.
 The maximum that could be paid for this investment is \$964.4.
 This investment has an internal rate of return of -3.5%.
 This investment does not pay back over this planning horizon.
 This investment may not be financially feasible due to negative cash flow in year two.

Maybe I'm too much of a pessimist, lets raise prices by \$10/Cwt.

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7				
Calf Crop or Weaning %	97	84	84	84	84	84	84	84	84	84	84
Steers Price (\$/Cwt)	150.45	143.74	143.13	146.75	154.10	160.58	163.57	166.83	170.48	175.82	175.82
Heifer Price (\$/Cwt)	143.45	136.74	136.13	139.75	147.10	153.58	156.57	159.83	163.48	168.82	168.82
Cull Cow Price (\$/Cwt)	\$77.71	\$74.56	\$74.27	\$75.97	\$79.43	\$82.47	\$83.88	\$85.41	\$87.13	\$89.63	\$89.63
Gross Receipts (Calf Sales)	\$767	\$634	\$631	\$647	\$680	\$710	\$723	\$738	\$754	\$778	\$778
Cow Operating Cost/Year	400	\$621	\$627	\$633	\$640	\$646	\$653	\$659	\$666	\$672	\$547
Net Above Operating Cost	\$367	\$13	\$4	\$14	\$40	\$64	\$70	\$79	\$88	\$106	\$231

Maybe I'm too much of a pessimist, let's raise prices by \$10/Cwt.

Cash Flows										Net Present Value	
Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7				
(\$440.00)	\$213.49	(\$54.44)	(\$62.84)	(\$55.17)	(\$33.13)	(\$30.23)	\$667.05	\$0.00	\$0.00	\$0.00	\$154.12

Comments regarding this investment scenario.

The positive net present value indicates this is an economically feasible investment.
 The maximum that could be paid for this investment is \$1254.1.
 This investment has an internal rate of return of 6.6%.
 This investment has a payback period of five years.
 This investment may not be financially feasible due to negative cash flow in year two.

What is a Cow's Only Job?

- What if one year she doesn't give us a calf?

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
Calf Crop or Weaning %	97	84	84	84	0	84	84	84	84	84	84
Steers Price (\$/Cwt)	140.45	133.74	133.13	136.75	144.10	150.58	153.57	156.83	160.48	165.82	165.82
Heifer Price (\$/Cwt)	133.45	126.74	126.13	129.75	137.10	143.58	146.57	149.83	153.48	158.82	158.82
Cull Cow Price (\$/Cwt)	\$73.01	\$69.86	\$69.57	\$71.27	\$74.73	\$77.77	\$79.18	\$80.71	\$82.43	\$84.93	\$84.93
Gross Receipts (Calf Sales)	\$714	\$588	\$586	\$602	\$0	\$664	\$678	\$693	\$709	\$733	\$733
Cow Operating Cost/Year	400	\$621	\$627	\$633	\$640	\$646	\$653	\$659	\$666	\$672	\$547
Net Above Operating Cost	\$314	(\$33)	(\$41)	(\$31)	(\$640)	\$18	\$25	\$34	\$43	\$61	\$186

Nothing Else Matters If She Doesn't Get Bred

Cash Flows											Net Present Value	
Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10		
(\$440.00)	\$172.49	(\$93.54)	(\$101.09)	(\$93.42)	(\$611.13)	(\$69.33)	(\$81.29)	(\$75.85)	\$33.42	\$868.54	\$0.00	(\$480.75)

Comments regarding this investment scenario.

The negative net present value indicates that the price of \$1100 per head is too high.

The maximum that could be paid for this investment is \$619.2.

This investment has an internal rate of return of -7.1%.

This investment does not pay back over this planning horizon

This investment may not be financially feasible due to negative cash flow in year two.

Questions



TEXAS A&M
AGRILIFE
 EXTENSION

For more Information

- **Contact Zach Wilcox**
- **He can get you a copy of this spreadsheet**

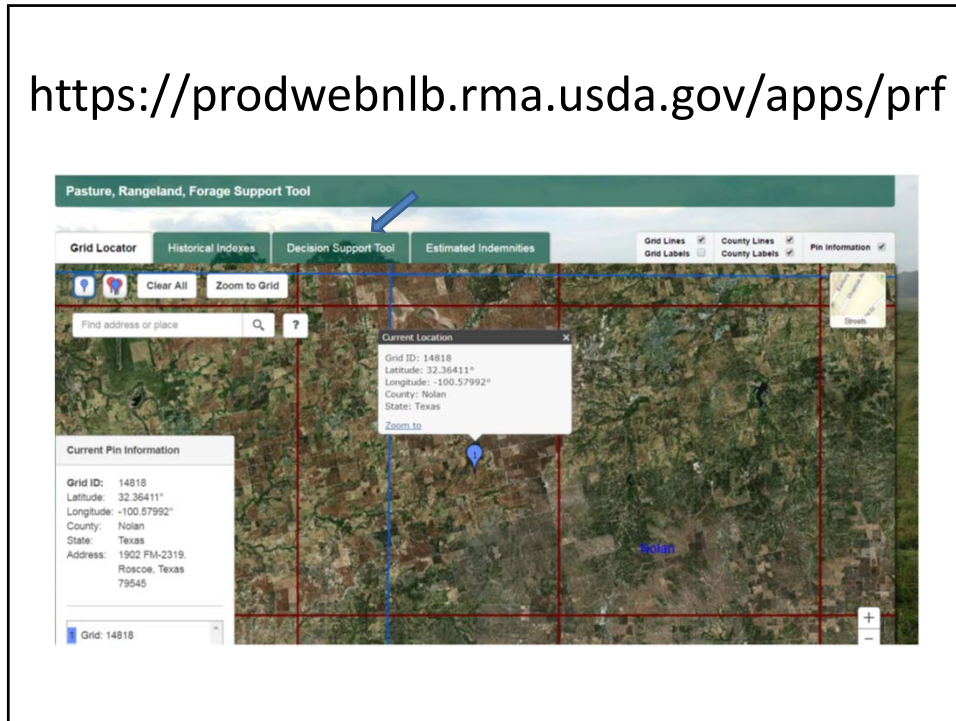
- **Relatively easy**
 - **User friendly**
 - **You should have the cost data in mind**
 - **Your price forecasts are just as valid as mine**

Pasture, Rangeland, Forage- Rainfall Index Insurance

- **How many are aware of the PRF program?**
- **How many are actually buying it?**

26% ?

https://prodwebnlb.rma.usda.gov/apps/prf



State: Texas County: Nolan Grid ID: 14818 Search By Grid ID: Enter Grid ID Search

Protection Information

Intended Use: Grazing
 Irrigation Practice: Please Select -
 Coverage Level: 90%
 Productivity Factor: 60%
 Insurable Interest: 100%
 Insured Acres: 100
 Sample Year: 2016

Policy Information

County Base Value: \$13.70
 Dollar Amount of Protection: \$7.40
 Total Insured Acres: 100
 Total Policy Protection: \$740
 Subsidy Level: 51.0%
 Maximum Percent of: 50.0%

Protection Table

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	17	\$126	31.50	\$40	\$20	\$20	33.4	\$79
Feb-Mar	N/A	\$0	29.06	\$0	\$0	\$0	71.9	\$0
Mar-Apr	18	\$133	27.75	\$37	\$19	\$18	207.2	\$0
Apr-May	N/A	\$0	20.25	\$0	\$0	\$0	203.1	\$0
May-Jun	17	\$126	16.28	\$20	\$10	\$10	153.2	\$0
Jun-Jul	N/A	\$0	21.56	\$0	\$0	\$0	98.5	\$0
Jul-Aug	16	\$118	24.94	\$30	\$15	\$15	62.5	\$36
Aug-Sep	N/A	\$0	24.94	\$0	\$0	\$0	110.0	\$0
Sep-Oct	16	\$118	19.56	\$23	\$12	\$11	80.9	\$12
Oct-Nov	N/A	\$0	24.45	\$0	\$0	\$0	165.3	\$0
Nov-Dec	16	\$118	33.41	\$40	\$20	\$20	305.8	\$0
Per Acre	N/A	N/A	N/A	\$1.89	\$0.97	\$0.94	N/A	\$1.27
Total	100	\$740	N/A	\$189	\$97	\$94	N/A	\$127

Calculate

This tool is using insurance data from 2017.
 This tool is for illustration purposes only. Your actual information may differ.

You Must Understand 3 Factors

- **Coverage Level**
- **Productivity Factor**
- **Index Interval**



Coverage Level Affects

- **Index level for indemnity**
- **Premium**
- **Subsidy rate**
- **Indemnity and Net Indemnity**



Coverage Level

- I suggest you use 90%
 1. You can enjoy a good rain. You only need to suffer a 10% below index shortfall to trigger a claim
 2. We can adjust cost using the Productivity factor.

Productivity Factor

- Every County has an assigned County Base Value
 - Nolan = \$13.70
 - Lampasas = \$14.50
 - Culberson = \$12.00
 - Llano = \$14.50
 - Foard = \$12.80
 - Wilson = \$21.40
- The Productivity factor is simply a multiplier for this county base value: 60% to 150%

Index Intervals

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

- If you are going to insure a particular interval, at least 10 percent is necessary
- No more than 50% in any given interval
- There cannot be any overlap between intervals



Index Intervals

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
16%		17%		17%		17%		17%		16%	

- If you are going to insure a particular interval, at least 10 percent is necessary
- No more than 50% in any given interval
- There cannot be any overlap between intervals



Index Intervals

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32%		32%		12%		12%		12%		0	

- If you are going to insure a particular interval, at least 10 percent is necessary
- No more than 50% in any given interval
- There cannot be any overlap between intervals

Index Intervals

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32%						18%					
			32%						18%		

- Buy Coverage across the whole year.
- Buy coverage when rain is most critical to your operation
- Buy coverage for period that you think will be driest.

Nolan County Example

- 90% Coverage
- Uniform coverage across the entire year
- 60% productivity factor
- Dollar amount of coverage= \$7.40
- Producer premium = \$0.94/Ac



State: Texas County: Nolan Grid ID: 14818 Search By Grid ID: Enter Grid ID Search

Protection Information

Intended Use: Grazing
 Irrigation Practice: Please Select -
 Coverage Level: 90%
 Productivity Factor: 60%
 Insurable Interest: 100%
 Insured Acres: 100
 Sample Year: 2016

Policy Information

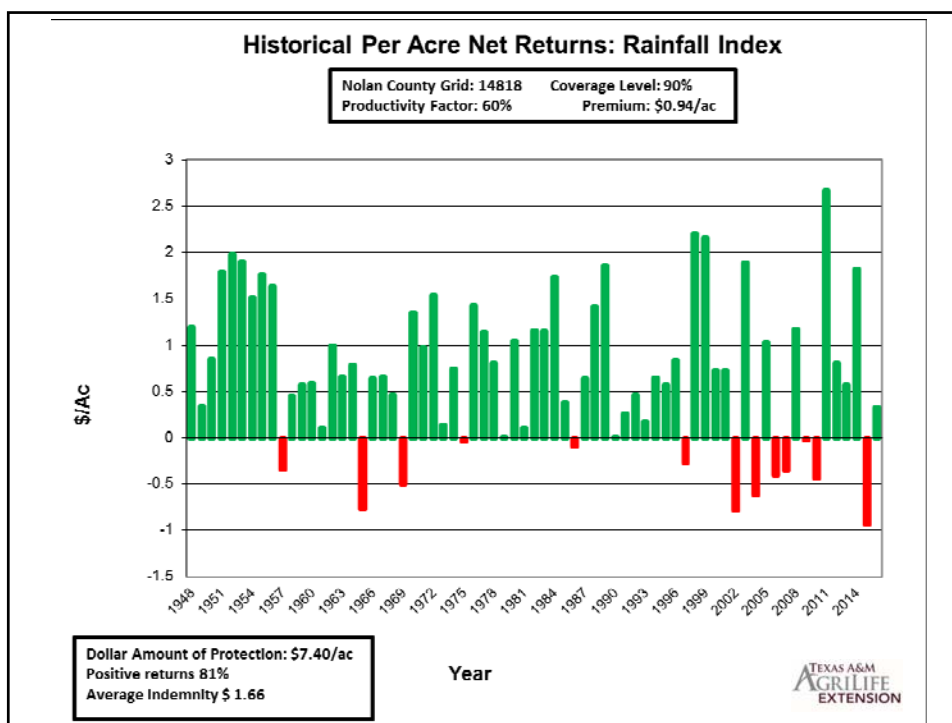
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Key Points

- Since 1948:
 - Only once did producer have to pay the entire premium (2015).
 - Only twice did the producer have to pay back to back net premiums; '06-'07 and '09-'10.
 - In periods where we paid net premiums... It Rained, and we likely grew grass!
- Bottom Line... This is fairly predictable and/or consistent.

PRF Insurance

- The typical assumption:
“I am going to buy PRF insurance so in periods of drought I can buy supplemental feed for my livestock.”
- The hope is that the net indemnities will offset any feed purchases, and I can afford to purchase supplemental feed.



PRF Insurance

- Typical PRF usage:
 - Ignores weaning weights of calves
 - Ignores BCS of cows which affects breeding efficiency.
 - Ignores what all managers say they want to avoid:
Over-Grazing
 - Reduced forage production,
 - Lost topsoil
 - Desertification
 - Invasive species
 - Etc, etc, etc . . .

PRF Insurance

- I am going to suggest that as part of our ranch/drought plan . . .
 - Buy PRF at the 85-90% coverage level
 - You decide the production level
 - Have coverage in place ***every*** year
 - Interval selection – 2 choices
 - All year (all intervals)
 - Intervals based on critical periods for the production of forage.
 - ***Reduce Normal stocking rates by 20%***

Reduced Stocking Rates

- Research literature supports this concept.
 - Oldest study I have found – 1949
 - The response is known, nobody does this kind of work nowadays.
- Use of PRF to sweeten the deal.
 - What is your motivator?
 - The carrot – net indemnities
 - The stick- net premiums, implies rain and we need our rangelands to be in a condition to reach their potential when that rain comes.

Grazing Studies

- **Summary of 25 Grazing Intensity studies**

(Holechek, Gomez, Molinar and Dee Galt, 1999)

- Heavy ———> Moderate

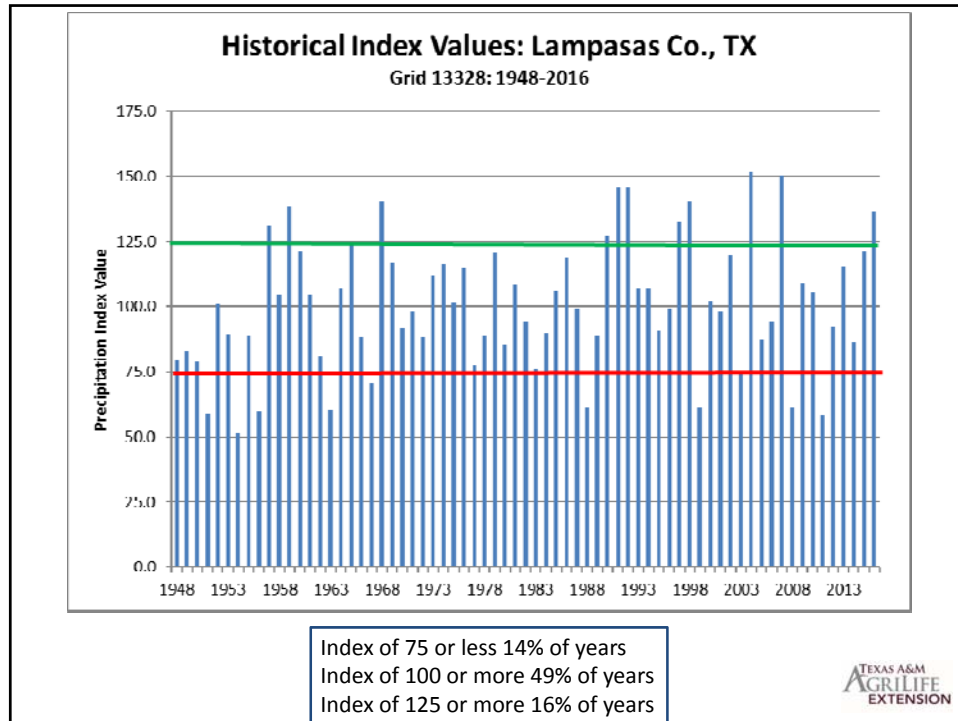
- 9% increase calf weaning weight
- 7 percentage point increase in Weaning % (72 to 79%)
- 10.5 % Increase in Lamb weaning Weight
- \$1.32 increase in returns per grazed acre

- Moderate —> Light

- 4% increase in calf weaning weight
- 3 percentage point increase in Weaning %

Summary

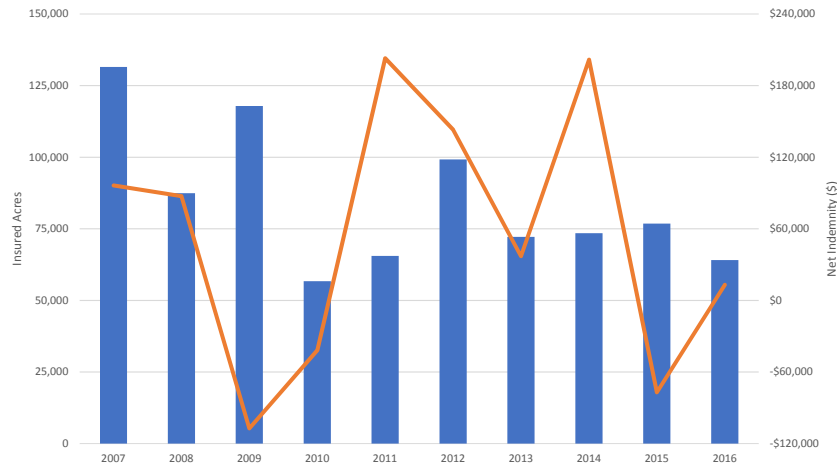
	30 Ac/AU, No PRF	36 Ac/AU, 85% PRF
Calf Weaning Percentage	83%	85%
Calf Weaning Weight	530.5 lbs	573 lbs
Sales Price \$/cwt	\$167.86	\$166.15
Gross livestock Sales	\$741.45	\$802.49
PRF Gross	\$0	\$65.16
Total Gross	\$741.45	\$867.65
PRF Cost	\$0	\$37.08
Total V.C.	\$382.10	\$426.41*
Total Cost	\$687.49	\$755.79
Net Return \$/cow	\$53.96	\$111.86
Net Return per Grazed Ac	\$1.80	\$3.11
Acres per AU	30	36



PRF Insurance

- Is the program perfect?
 - NO!
- Are there reporting stations in every grid?
 - Of course not.
- Have some people not collected a payment for an interval that did not receive enough rain?
 - Yes, very likely!
- Have some people collected a payment for an interval that also received at least 90% of average rain?
 - Yes, very likely!

Nolan County PRF Usage and Results: 2007-2016



Bottom Line . . .

- On Average, 84,500 acres per year are insured in Nolan county.
 - Only about 26% of the 327,301 permanent pasture/rangeland acres (Census of Ag)
 - A little over 2,700 acres per policy are insured
 - Premiums cost \$0.99 per insured acre
- Your Neighbors(and maybe you) have kept \$1.4 million above the cost of the premiums since 2007.

A work in Progress

- I'm still working the rough edges off this analysis.
 - Inclusion of the extra grazing from the years where rainfall is 125%+ of average.
 - Decision on how to model years with 75% of normal precipitation
 - Creating a model to look at this year by year.

Questions



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AGRILIFE
EXTENSION

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