

Measuring Up: Perennial Forage vs. Row Crop



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Institute of Agriculture and Natural Resources

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Key Points and Objectives

- Profit margins for traditional commodity crops are much smaller.
- Perennial forages provide an option to row crops but involve a multiple year commitment to recover establishment costs.
- Key questions:
 - How will you harvest the revenue from the forage?
 - What type of forage (warm-season vs. cool-season) will you plant?
 - How does this fit into your long-term strategy?
- The primary purpose of this webinar is to help you think through the key questions you should be asking yourself as you decide if you want to change some of your crop acres to perennial forage.



Establishment and Maintenance Costs for Warm-Season Perennial Grass Pasture

Establishment cost item	\$/acre
Grass seed mixture ¹	\$150.00
Glyphosate + application	\$20.00
Starter fertilizer (20-20-20)	-
No-till drill seeding	\$20.00
Quinclorac + application	\$40.00
Interest on operations ²	\$9.49
TOTAL	\$239.49

¹ 10 lbs. PLS/acre of low diversity warm-season mixture @\$15/PLS.

² Operating interest at 8.25% for 6 months.

Maintenance cost item	\$/acre
Fertilizer ³	\$39.00
Maintenance ⁴	\$10.00
Interest on operations ²	\$2.02
Maintenance Subtotal	\$51.02
Amortized Establishment Costs ⁵	\$31.01
TOTAL ANNUAL COST	\$82.03

³ 50 lbs. N (32%) @ \$0.60 per lb. + \$9 application

⁴ Fencing, water, herbicide, etc.

⁵ Amortized at 5% interest for 10 years



Warm-Season Perennial Grass Pasture

<i>Annual operating + amortized establishment costs¹</i>	<i>\$/acre</i>	<i>\$/AUM²</i>
1 year	\$ 424.28	\$ 141.43
2 years	\$ 242.20	\$ 60.55
3 years	\$ 181.56	\$ 45.39
5 years	\$ 133.13	\$ 33.28
10 years	\$ 97.06	\$ 24.26
15 years	\$ 85.27	\$ 21.32

¹ Establishment costs (forage, water, fence) amortized at 5% interest.

² \$/AUM for warm-season grass mixture estimated using 3 AUM/acre for year 1 of production (75% of total production potential) and 4 AUM/acre for years 2-15.



Establishment and Maintenance Costs for Non-Irrigated Cool-Season Perennial Grass Pasture

<i>Establishment cost item</i>	<i>\$/acre</i>
Grass seed mixture ¹	\$67.50
Glyphosate + application	\$20.00
No-till drill seeding	\$20.00
Starter fertilizer (20-20-20)	\$18.00
Interest on operations ²	\$5.18
TOTAL	\$130.68

¹ 15 lbs. PLS/acre of diverse cool-season mixture @\$4.50/PLS.

² Operating interest at 8.25% for 6 months.

<i>Maintenance cost item</i>	<i>\$/acre</i>
Fertilizer ³	\$99.00
Maintenance ⁴	\$10.00
Interest on operations ²	\$4.50
<i>Maintenance Subtotal</i>	\$113.50
Amortized Establishment Costs ⁵	\$16.92
<i>TOTAL ANNUAL COST</i>	\$130.42

³ 150 lbs. N (32%) @ \$0.60 per lb. + \$9 application

⁴ Fencing, water, herbicide, etc.

⁵ Amortized at 5% interest for 10 years



Cool-Season Perennial Grass Pasture

<i>Annual operating + amortized establishment costs¹</i>	<i>\$/acre</i>	<i>\$/AUM²</i>
1 year	\$ 372.51	\$ 124.17
2 years	\$ 246.16	\$ 82.05
3 years	\$ 204.08	\$ 68.03
5 years	\$ 170.47	\$ 56.82
10 years	\$ 145.44	\$ 48.48
15 years	\$ 137.26	\$ 45.75

¹ Establishment costs (forage, water, fence) amortized at 5% interest.

² \$/AUM for cool-season grass mixture estimated using 3 AUM/acre for productive years 1-15.



Establishment and Maintenance Costs for Irrigated Cool-Season Perennial Grass Pasture

<i>Establishment cost item</i>	<i>\$/acre</i>
Grass seed mixture	\$67.50
Glyphosate + application	\$20.00
No-till drill seeding	\$20.00
Starter fertilizer (20-20-0)	\$18.00
Fall irrigation (3 inches)	\$40.00
Interest on operations ²	\$6.83
TOTAL	\$172.33

<i>Maintenance cost item</i>	<i>\$/acre</i>
Fertilizer ³	\$105.00
Irrigation (12 inches)	\$160.00
Maintenance ⁴	\$10.00
Interest on operations ²	\$11.34
<i>Maintenance Subtotal</i>	\$286.34
Amortized Establishment Costs ⁵	\$22.32
<i>TOTAL ANNUAL COST</i>	\$308.66

¹ 15 lbs. PLS/acre of diverse cool-season mixture @\$4.50/PLS.

² Operating interest at 8.25% for 6 months.

³ 160 lbs. N (32%) @ \$0.60 per lb. + \$9 application

⁴ Fencing, water, herbicide, etc.

⁵ Amortized at 5% interest for 10 years



Cool-Season Irrigated Perennial Grass Pasture

<i>Annual operating + amortized establishment costs¹</i>	<i>\$/acre</i>	<i>\$/AUM²</i>
1 year	\$ 589.09	\$ 57.47
2 years	\$ 441.41	\$ 43.06
3 years	\$ 392.22	\$ 38.27
5 years	\$ 352.94	\$ 34.43
10 years	\$ 323.68	\$ 31.58
15 years	\$ 314.12	\$ 30.65

¹ Establishment costs (forage, water, fence) amortized at 5% interest.

² \$/AUM for cool-season grass mixture estimated using 10.25 AUM/acre [Spring (6.4 AUM/acre) and Fall (3.85 AUM/acre)] for years 1-15.





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2024 UNL Crop Budgets

2024 Crop Budget File Downloads

PDF

Excel

ABC Crop Enterprise Reports

Ag Budget Calculator Program



The Agricultural Budget Calculator (ABC) Program makes it possible to



<https://cap.unl.edu/cropbudgets>





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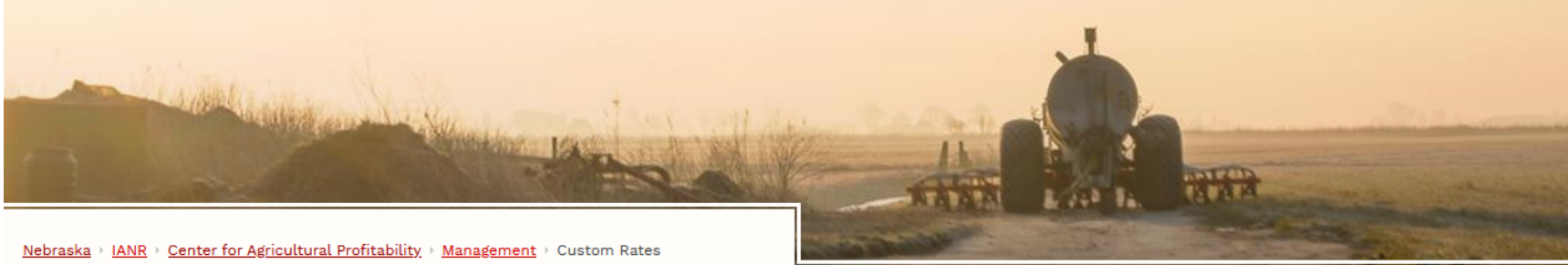
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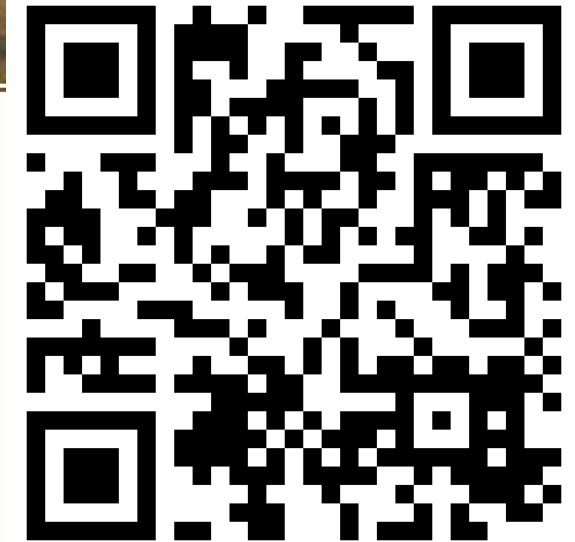


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Nebraska Farm Custom Rates Report

About the report

A survey of agricultural custom operators is conducted in Nebraska every two years. A total of 193 survey responses were received in 2022 with information reflecting the current rates charged by custom operators for machine hire services and other work they provide for neighboring farms and ranches or as part of a business enterprise that covers a broader area. Survey participants identified by Nebraska Extension personnel, or in some cases, self-identified custom operators, received a paper survey or a web link to complete the custom rates survey online.



<https://cap.unl.edu/customrates>



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Forage Value Estimates

- 2024 Nebraska Farm Real Estate Market Survey (preliminary estimates) - <https://agecon.unl.edu/2024-nebraska-farmland-values-and-cash-rental-rates>

	NW	North	NE	Central	East	SW	South	SE
Cow-Calf Pair Monthly Rates								
Average.....	51.20	73.95	70.10	68.05	66.45	60.55	57.30	64.35
% Change.....	11	6	4	2	6	3	1	7
High Third Quality.....	58.35	84.15	79.85	80.60	75.20	65.85	69.50	73.65
Low Third Quality.....	43.80	61.45	57.10	55.35	54.95	52.40	48.15	50.45
Average x 1.25 AUMs per pair	64.00	92.44	87.63	85.06	83.06	75.69	71.63	80.44
Hay Price per ton	\$100	\$125	\$150	\$175	\$200	\$225	\$250	
Price per AUM @ 2.5 AUMs per ton	\$40	\$50	\$60	\$70	\$80	\$90	\$100	



Corn production costs and returns per planted acre, excluding Government payments, land, taxes, and general overhead

	2021	2022	2023	2024*
Gross value of production	944.56	1,170.19	920.41	796.40
Total, operating costs	353.33	519.11	482.29	448.02
Value of production less operating costs	591.23	651.08	438.12	348.38
Allocated overhead				
Hired labor	3.87	4.15	4.40	4.37
Opportunity cost of unpaid labor	26.44	28.45	29.94	29.91
Capital recovery of machinery and equipment	146.53	153.65	159.70	160.97
Value of production less total costs listed	414.39	464.83	244.08	153.13

* Forecast

Data Source: USDA - ERS



Soybean production costs and returns per planted acre, excluding Government payments, land, taxes, and general overhead

	2021	2022	2023	2024*
Gross value of production	655.23	708.36	677.02	582.40
Total, operating costs	193.79	267.83	255.52	243.26
Value of production less operating costs	461.44	440.53	421.50	339.14
Allocated overhead				
Hired labor	5.37	5.87	6.14	6.17
Opportunity cost of unpaid labor	18.77	20.36	21.33	21.39
Capital recovery of machinery and equipment	125.39	130.97	136.39	137.22
Value of production less total costs listed	311.91	283.33	257.64	174.37

* Forecast

Data Source: USDA - ERS



Cool-Season Irrigated Perennial Grass Pasture

<i>Annual operating + amortized establishment costs¹</i>	<i>Cost</i>	<i>Value²</i>	<i>Net Return</i>
1 year	\$ 589.09	\$ 820.00	\$ 230.91
2 years	\$ 441.41	\$ 820.00	\$ 378.59
3 years	\$ 392.22	\$ 820.00	\$ 427.78
5 years	\$ 352.94	\$ 820.00	\$ 467.06
10 years	\$ 323.68	\$ 820.00	\$ 496.32
15 years	\$ 314.12	\$ 820.00	\$ 505.88

¹ Establishment costs (forage, water, fence) amortized at 5% interest.

² \$/acre for cool-season grass mixture estimated using 10.25 AUM/acre [Spring (6.4 AUM/acre) and Fall (3.85 AUM/acre)] for years 1-15 at \$80/AUM.



Cool-Season Perennial Grass Pasture

<i>Annual operating + amortized establishment costs¹</i>	<i>Cost</i>	<i>Value²</i>	<i>Net Return</i>
1 year	\$ 372.51	\$ 240.00	\$ 132.51
2 years	\$ 246.16	\$ 240.00	\$ 6.16
3 years	\$ 204.08	\$ 240.00	\$ 35.92
5 years	\$ 170.47	\$ 240.00	\$ 69.53
10 years	\$ 145.44	\$ 240.00	\$ 94.56
15 years	\$ 137.26	\$ 240.00	\$ 102.74

¹ Establishment costs (forage, water, fence) amortized at 5% interest.

² \$/acre for cool-season grass mixture estimated using 3 AUM/acre for productive years 1-15 at \$80/AUM.



Warm-Season Perennial Grass Pasture

<i>Annual operating + amortized establishment costs¹</i>	<i>Cost</i>	<i>Value²</i>	<i>Net Return</i>
1 year	\$ 424.28	\$ 240.00	\$ 184.28
2 years	\$ 242.20	\$ 320.00	\$ 77.80
3 years	\$ 181.56	\$ 320.00	\$ 138.44
5 years	\$ 133.13	\$ 320.00	\$ 186.87
10 years	\$ 97.06	\$ 320.00	\$ 222.94
15 years	\$ 85.27	\$ 320.00	\$ 234.73

¹ Establishment costs (forage, water, fence) amortized at 5% interest.

² \$/acre for warm-season grass mixture estimated using 3 AUM/acre for year 1 of production (75% of total production potential) and 4 AUM/acre for years 2-15 at \$80/AUM.



Pasture, Rangeland and Forage (PRF) Insurance



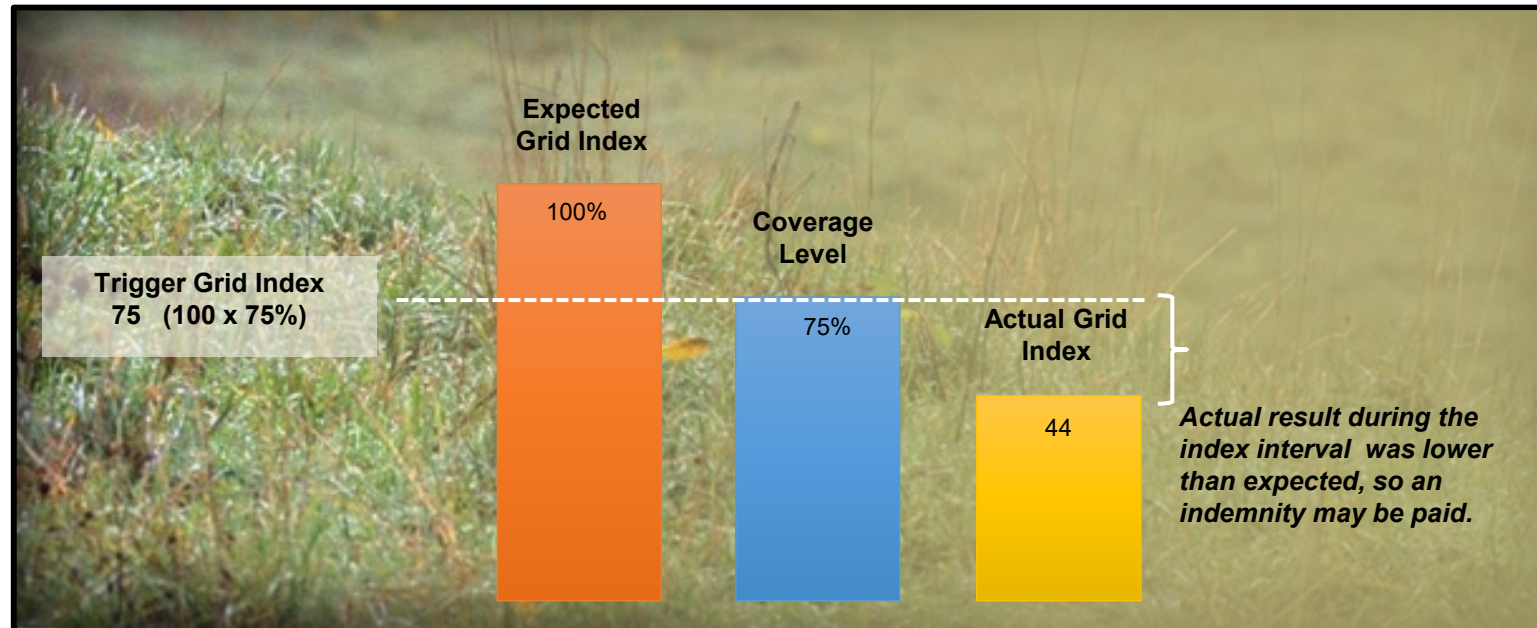
Rainfall Index

- Provides coverage for perennial forage (pasture, rangeland, forage) used for livestock grazing or haying.
- Sign up deadline December 1 in all counties for coverage in the following calendar year.
- Utilizes a grid-level rainfall index to determine precipitation for coverage purposes. It does not directly measure actual production loss for each operation.
- Coverage available for two-month rainfall index intervals covering the calendar year with coverage up to 90% of normal.
- Each grid is 0.25 degrees in latitude by 0.25 degrees in longitude, (~ 17 by 17 miles at the equator).
- Subsidy levels 51% to 59% depending on coverage.



Using Grid Indices

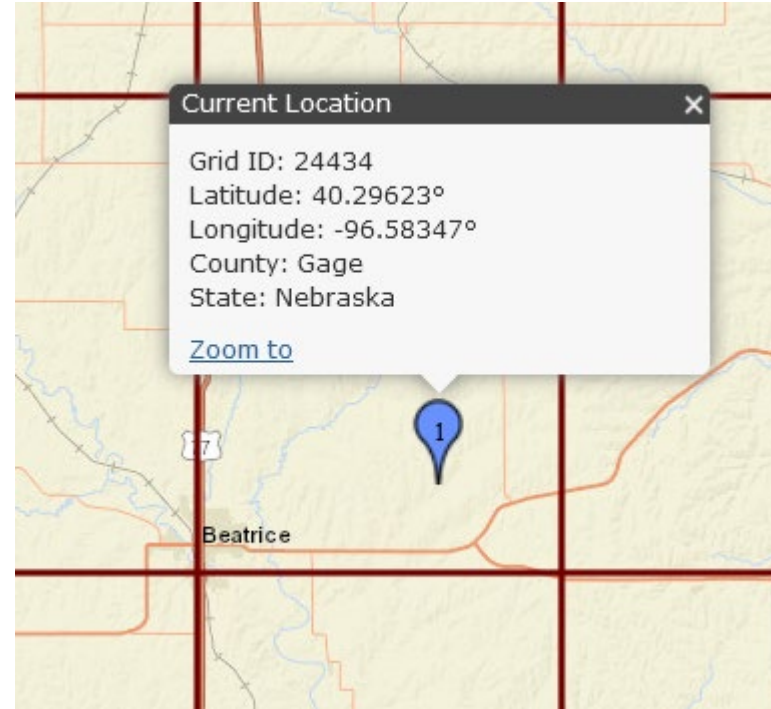
- The expected grid index is compared to the final grid index. Producers may receive an indemnity if the actual final index falls below the trigger grid index, which is adjusted based on the coverage level.



Example Grid

Grid: 24434

County:
Gage



PRF Sample Coverage (Grid 24434)

Production Information	
Intended Use	Grazing
Coverage Level	90%
Productivity Factor	100%
Base Value	\$56.30
Amount of Protection	\$50.67
Subsidy	51%

Base Strategy

Protection Table (per acre)

Index Interval	Percent of Value (%)	Policy Protection Per Unit	Premium Rate Per \$100	Total Premium	Producer Premium
Jan-Feb	15%	\$7.60	21.90	\$1.66	\$0.81
Mar-Apr	15%	\$7.60	16.46	\$1.25	\$0.61
May-Jun	20%	\$10.13	10.95	\$1.11	\$0.54
Jul-Aug	20%	\$10.13	14.16	\$1.43	\$0.70
Sep-Oct	15%	\$7.60	16.82	\$1.28	\$0.63
Nov-Dec	15%	\$7.60	24.74	\$1.88	\$0.92
TOTAL	100%	\$50.67	N/A	\$8.61	\$4.21



PRF Sample Coverage (Grid 24434) - Grazing

Year	Indemnity	Year	Indemnity
2023	\$9.38	2013	\$2.58
2022	\$16.85	2012	\$13.51
2021	\$7.31	2011	\$12.71
2020	\$9.76	2010	\$1.65
2019	\$1.06	2009	\$8.85
2018	\$4.47	2008	\$6.79
2017	\$7.89	2007	\$0.00
2016	\$3.33	2006	\$6.24
2015	\$3.19	2005	\$10.99
2014	\$12.08	2004	\$6.92

Base Strategy

Premium \$4.21
Average Indemnity \$7.28
Producer Loss Ratio 1.73

Net Positive (Indemnity > Premium)
70% (14/20 years)



PRF Sample Coverage (Grid 24434)

Production Information	
Intended Use	Haying
Coverage Level	90%
Productivity Factor	100%
Base Value	\$251.00
Amount of Protection	\$225.90
Subsidy	51%

Base Strategy

Protection Table (per acre)

Index Interval	Percent of Value (%)	Policy Protection Per Unit	Premium Rate Per \$100	Total Premium	Producer Premium
Jan-Feb	15%	\$33.89	21.90	\$7.42	\$3.64
Mar-Apr	15%	\$33.89	16.46	\$5.58	\$2.73
May-Jun	20%	\$45.18	10.95	\$4.95	\$2.43
Jul-Aug	20%	\$45.18	14.16	\$6.40	\$3.14
Sep-Oct	15%	\$33.89	16.82	\$5.70	\$2.79
Nov-Dec	15%	\$33.89	24.74	\$8.38	\$4.11
TOTAL	100%	\$225.90	N/A	\$38.43	\$18.84



PRF Sample Coverage (Grid 24434) - Haying

Year	Indemnity	Year	Indemnity
2023	\$41.87	2013	\$11.54
2022	\$75.16	2012	\$50.20
2021	\$32.58	2011	\$56.65
2020	\$43.51	2010	\$7.34
2019	\$4.74	2009	\$39.45
2018	\$19.96	2008	\$30.28
2017	\$35.18	2007	\$0.00
2016	\$14.88	2006	\$27.87
2015	\$14.24	2005	\$48.97
2014	\$53.82	2004	\$30.86

Premium \$18.84
Average Indemnity \$31.96
Producer Loss Ratio 1.70

Net Positive (Indemnity > Premium)
70% (14/20 years)

Base Strategy



UNL-Value of Standing Forage Tool

An Excel spreadsheet for evaluating the value of standing forage in the field.



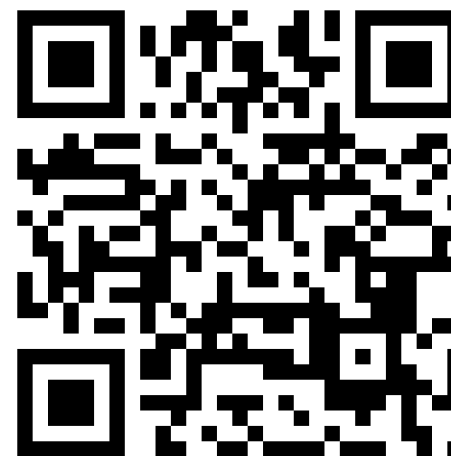
AGRICULTURAL ECONOMICS

Farm and Ranch Management

Version: 2020-07-31



<https://cap.unl.edu/forage>

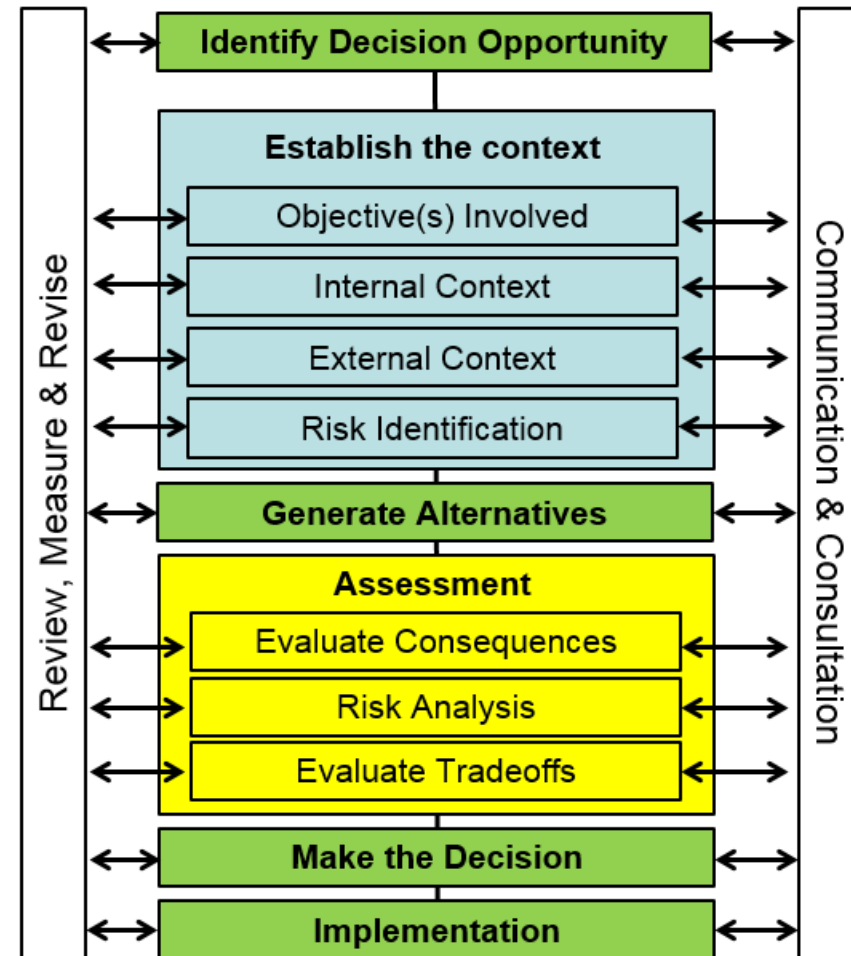


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Smart Choices in Agriculture

- <https://agecon.unl.edu/cornhusker-economics/2018/smart-choices-agriculture>



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