# Budgeting for a Pasture Rental Rate

**Robin Reid**

**Ag. Economics, KSU**

**Clay Center, KS**

**January 11th, 2016**



# The *"Going Rate"*

- Depends largely on characteristics of the pasture:
  - When the lease was last negotiated
  - Type of cattle
  - Type of soil/grass
  - Availability of water
  - Who maintains fence
  - Who manages weeds/brush
  - Cattle, forage, and grain markets

KANSAS STATE UNIVERSITY | Department of Agricultural Economics

# Pasture Rental Rates

- Most common question for K-State Extension
  - What is the going rate for pasture (cropland) in my area?
- How do we answer this question?
  - Publically available information
  - USDA-NASS pasture rent estimates
  - Bluestem Pasture Report



# Pasture Rental Rates

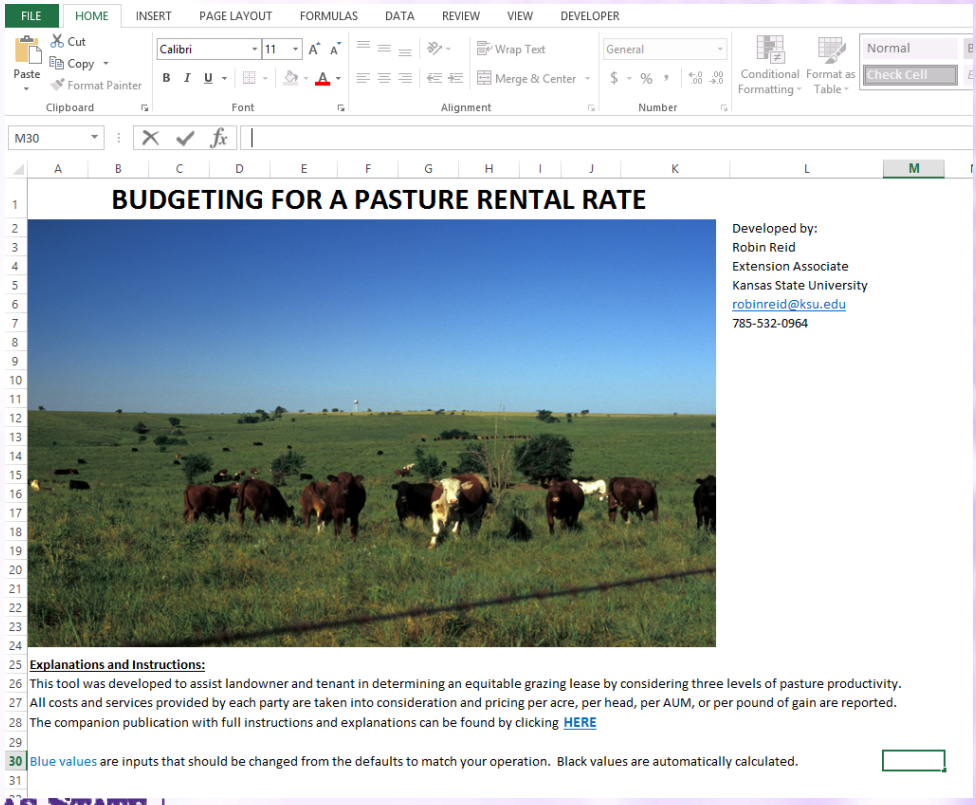
- Public data is limited and lagged
  - Next county-level rent estimates will be in?
  - Bluestem pasture report is transitioning
  - County Extension surveys don't cover the state consistently
- Another option we can pursue is to use
  - Pasture-specific information
  - Operation-specific costs and production practices
  - Current and expected cattle market prices
  - Put into a decision tool (spreadsheet) and…

Voila!

# Pasture Rent Tool

- Purpose of the tool
  - Get landowners and ranchers to talk
  - Demonstrate the economic value of good & poor pasture
  - Avoid fixed cash rents that get out of date quickly
  - Give both parties an 'out' if conditions change mid-season
- Have to change our focus from $/acre
  - Move to productivity-based pricing ($/AUM, $HEAD)
  - Reward good land management






KANSAS STATE UNIVERSITY | Department of Agricultural Economics

# Pasture Rent Tool: Inputs

- Expected returns
  - Cattle prices (purchase and sell price)
- Costs of production
  - Assigned to landowner and tenant
- Productivity measures
  - Stocking rates
  - Productive potential under different rainfall conditions
  - Look to NRCS



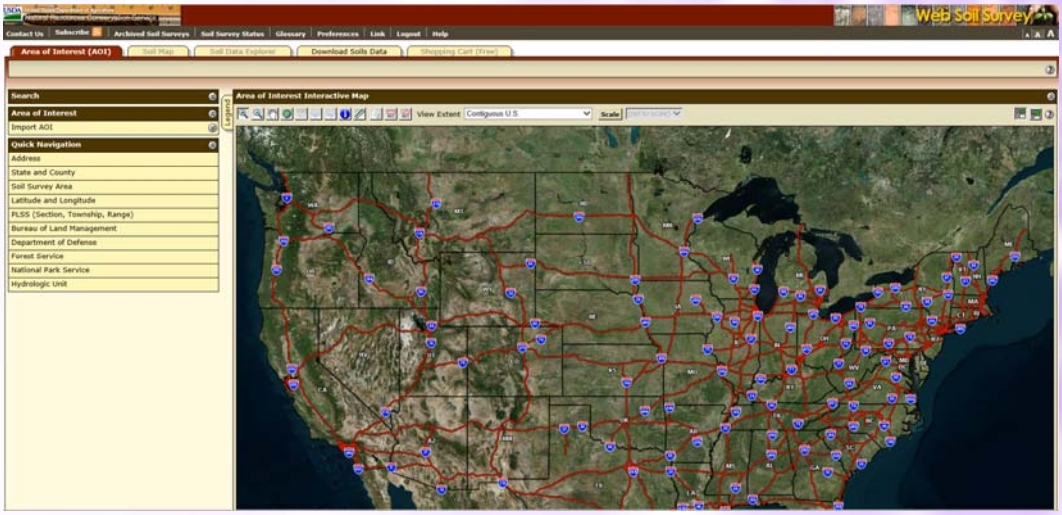
# Pasture Productivity

## Calculating a Stocking Rate

| Inputs | |
|---|---|
| Grazing Period Start | 5/1/2016 |
| Grazing Period End | 10/31/2016 |
| Grazing Days | 183 |
| Total Acres of Pasture | 160 |

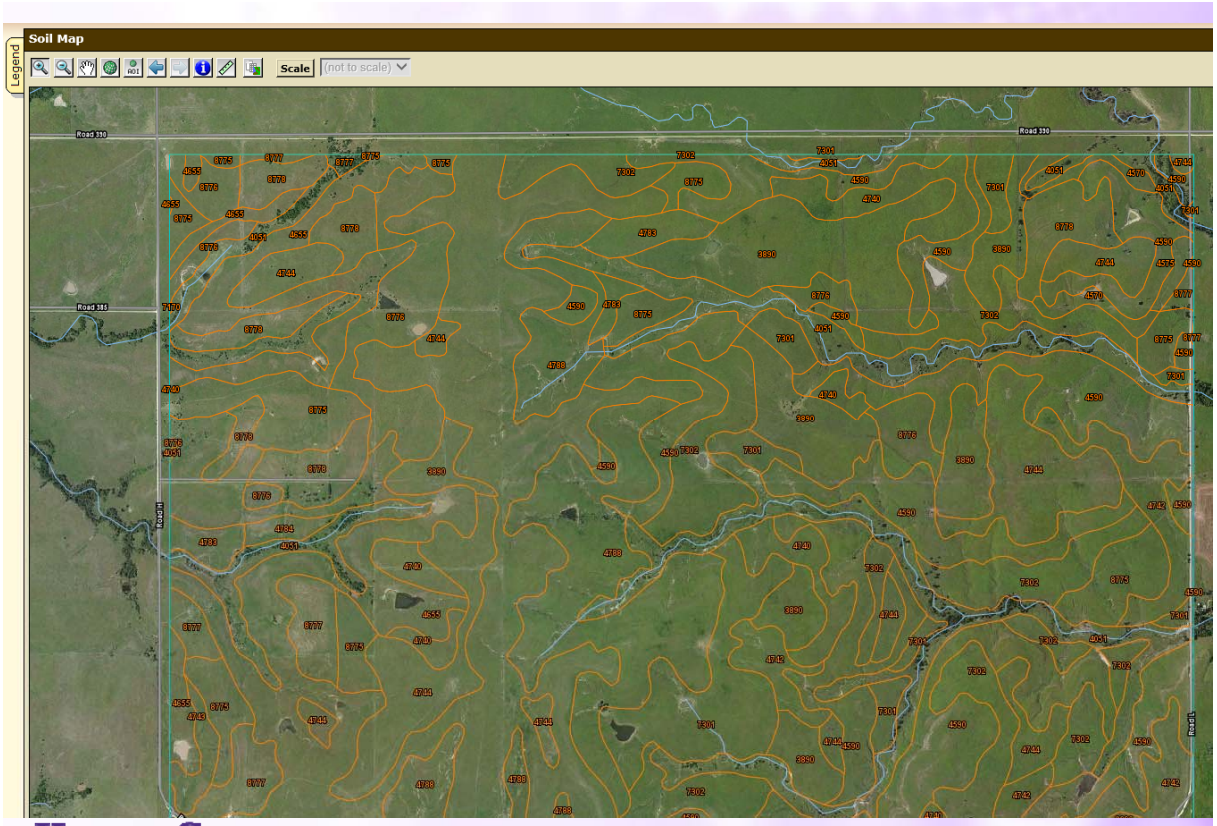
| | Unfavorable Year | Normal Year | Favorable Year |
|---|---|---|---|
| Pounds of Production per Acre | 3500 | 4500 | 5500 |
| Pounds of Grazed Forage per Acre | 875 | 1125 | 1375 |
| AUM's available/Acre | 0.96 | 1.23 | 1.51 |
| Total AUM's for pasture | 153 | 197 | 241 |
| Consumed pounds of forage on pasture | 140,000 | 180,000 | 220,000 |

# NRCS Web Soil Survey






Source: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx



# Productivity in a Normal Year

Tables — Range Production (Normal Year) — Summary By Map Unit

Summary by Map Unit — Lyon County, Kansas (KS111)

| Map unit symbol | Map unit name | Rating (pounds per acre per year) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 3890 | Ladysmith silty clay loam, 0 to 1 percent slopes | 3465 | 283.5 | 7.6% |
| 4051 | Ivan silt loam, channeled | 6800 | 338.4 | 9.1% |
| 4570 | Clime silty clay, 3 to 7 percent slopes | 4050 | 20.8 | 0.6% |
| 4575 | Clime silty clay, 3 to 7 percent slopes, eroded | 4050 | 6.5 | 0.2% |
| 4590 | Clime-Sogn complex, 3 to 20 percent slopes | 2725 | 548.3 | 14.8% |
| 4655 | Florence-Labette complex, 2 to 12 percent slopes | 3193 | 712.0 | 19.2% |
| 4740 | Labette silty clay loam, 1 to 3 percent slopes | 3825 | 102.0 | 2.8% |
| 4742 | Labette silty clay loam, 3 to 7 percent slopes | 3825 | 114.5 | 3.1% |
| 4743 | Labette silty clay loam, 3 to 7 percent slopes, eroded | 4575 | 15.2 | 0.4% |
| 4744 | Labette-Dwight complex, 0 to 3 percent slopes | 3438 | 251.6 | 6.8% |
| 4783 | Tully silty clay loam, 3 to 7 percent slopes | 3600 | 41.6 | 1.1% |
| 4784 | Tully silty clay loam, 3 to 7 percent slopes, eroded | 3825 | 9.6 | 0.3% |
| 4788 | Tully-Clime complex, 7 to 15 percent slopes | 4275 | 294.8 | 8.0% |
| 7170 | Reading silt loam, rarely flooded | 7200 | 0.2 | 0.0% |
| 7301 | Martin silty clay loam, 1 to 3 percent slopes | 4900 | 155.1 | 4.2% |
| 7302 | Martin silty clay loam, 3 to 7 percent slopes | 4830 | 291.3 | 7.9% |
| 7306 | Martin silty clay, 3 to 7 percent slopes, eroded | 4850 | 0.0 | 0.0% |
| 8775 | Kenoma silt loam, 1 to 3 percent slopes | 3888 | 173.1 | 4.7% |
| 8776 | Kenoma silt loam, 3 to 5 percent slopes | 3200 | 147.6 | 4.0% |
| 8777 | Kenoma silty clay loam, 1 to 3 percent slopes, eroded | 3865 | 74.0 | 2.0% |
| 8778 | Kenoma silty clay loam, 3 to 5 percent slopes, eroded | 3875 | 128.1 | 3.5% |
| Totals for Area of Interest | | | 3,708.4 | 100.0% |



# Cattle Characteristics

| | | Forage Consumed per Day (lbs) | Total Forage For Grazing Period (lbs) |
|---|---|---|---|
| COW/CALF PAIRS | | 49.5 | 9058.5 |
| Mature Cow Weight | 1250 | | |
| Calf Starting Weight | 250 | | |
| Calf Ending Weight | 550 | | |
| BULLS | | 54 | 3294 |
| Average Weight | 1800 | | |
| Date In | 6/1/2016 | | |
| Date Out | 8/1/2016 | | |
| # of Cows per Bull | 25 | | |

OR

| | | Forage Consumed per Day (lbs) | Total Forage For Grazing Period (lbs) |
|---|---|---|---|
| STOCKER CATTLE | | 23 | 4255 |
| Starting Weight | 600 | | |
| Ending Weight | 950 | | |
| Average Daily Gain | 1.91 | | |

# Stocking Rates

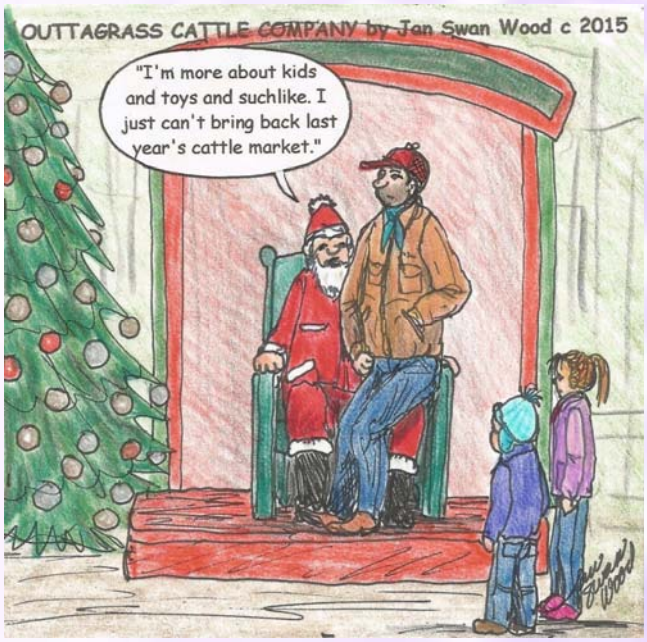
| Ideal Stocking Rate | | | |
|---|---|---|---|
| | Unfavorable Year | Normal Year | Favorable Year |
| Number of Cow/Calf Pairs | 15.2 | 19.6 | 23.9 |
| Number of Bulls | 0.6 | 0.8 | 1.0 |
| | | | |
| Acres per Cow/Calf Pair & Proportion of Bull | 10.5 | 8.2 | 6.7 |

OR

| Ideal Stocking Rate | | | |
|---|---|---|---|
| Stocker Cattle | 32.9 | 42.3 | 51.7 |
| | | | |
| Acres per Stocker | 4.9 | 3.8 | 3.1 |



# Expected Returns



# Expected Returns

Budgeting for St

| Inpu | |
|---|---|
| Grazing Period Start | |
| Grazing Period End | |
| Grazing Days | |
| Total Acres of Pasture | |
| | |
| Growing Season | |
| # of head | |
| Acres per Head | |

| Expected Cattle Returns | | |
|---|---|---|
| | | Per Head |
| Beginning Weight (lbs) | 600 | |
| Beginning Cost ($/cwt) | $185.00 | $ (1,110.00) |
| Death Loss | 1.00% | $ (11.10) |
| Ending Weight (lbs) | 950 | |
| Expected Ending Price ($/cwt | $150.00 | $ 1,425.00 |
| | | |
| Net Income per head | | $ 303.90 |

| Per Head | |
|---|---|
| $ | (1,110.00) |
| $ | (11.10) |
| $ | 1,425.00 |
| $ | 303.90 |

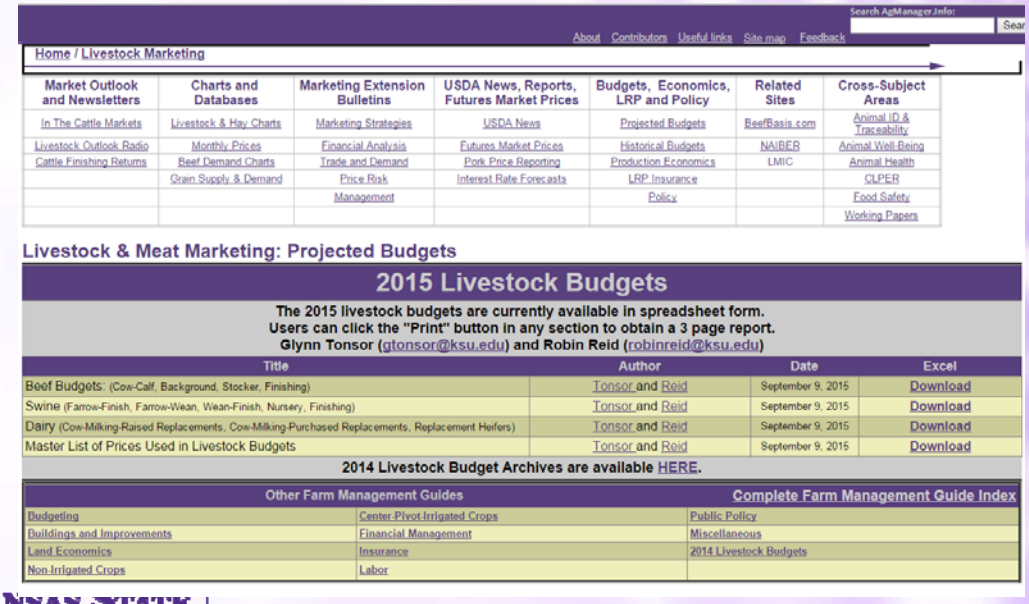
KANSAS STATE UNIVERSITY | Department of Agricultural Economics

# Production Costs

| $/head | Total for Herd Unfavorable | Normal | Favorable | Cost Paid by Producer % | Landowner % |
|---|---|---|---|---|---|
| $0.00 | $ - | $ - | $ - | 100.00% | 0.00% |
| $0.00 | $ - | $ - | $ - | 100.00% | 0.00% |
| $12.58 | $ 415.18 | $ 528.41 | $ 654.23 | 100.00% | 0.00% |
| $20.00 | $ 750.00 | $ 840.00 | $ 940.00 | 100.00% | 0.00% |
| $7.00 | $ 231.00 | $ 294.00 | $ 364.00 | 100.00% | 0.00% |
| $11.00 | $ 363.00 | $ 462.00 | $ 572.00 | 100.00% | 0.00% |
| $6.00 | $ 225.00 | $ 252.00 | $ 282.00 | 100.00% | 0.00% |
| $10.00 | $ 375.00 | $ 420.00 | $ 470.00 | 100.00% | 0.00% |
| $27.83 | $ 918.26 | $ 1,168.69 | $ 1,446.95 | 100.00% | 0.00% |
| $2.00 | $ 66.00 | $ 84.00 | $ 104.00 | 100.00% | 0.00% |
| -- | $ 535.50 | $ 535.50 | $ 535.50 | 100.00% | 0.00% |
| **Total Costs** | **$ 3,878.94** | **$ 4,584.61** | **$ 5,368.68** | | |
| Per Head | $ 117.54 | $ 109.16 | $ 103.24 | | |
| Per Head plus beg. Value | $ 1,227.54 | $ 1,219.16 | $ 1,213.24 | | |

KANSAS STATE UNIVERSITY | Department of Agricultural Economics

# Production Costs



Search AgManager.info: Sear

About Contributors Useful links Site map Feedback

Home / Livestock Marketing

| Market Outlook and Newsletters | Charts and Databases | Marketing Extension Bulletins | USDA News, Reports, Futures Market Prices | Budgets, Economics, LRP and Policy | Related Sites | Cross-Subject Areas |
|---|---|---|---|---|---|---|
| In The Cattle Markets | Livestock & Hay Charts | Marketing Strategies | USDA News | Projected Budgets | BeefBasis.com | Animal ID & Traceability |
| Livestock Outlook Radio | Monthly Prices | Financial Analysis | Futures Market Prices | Historical Budgets | NAIBER | Animal Well-Being |
| Cattle Finishing Returns | Beef Demand Charts | Trade and Demand | Pork Price Reporting | Production Economics | LMIC | Animal Health |
| | Grain Supply & Demand | Price Risk | Interest Rate Forecasts | LRP Insurance | | CLPER |
| | | Management | | Policy | | Food Safety |
| | | | | | | Working Papers |

Livestock & Meat Marketing: Projected Budgets

2015 Livestock Budgets

The 2015 livestock budgets are currently available in spreadsheet form.
Users can click the "Print" button in any section to obtain a 3 page report.
Glynn Tonsor (gtonsor@ksu.edu) and Robin Reid (robinreid@ksu.edu)

| Title | Author | Date | Excel |
|---|---|---|---|
| Beef Budgets: (Cow-Calf, Background, Stocker, Finishing) | Tonsor and Reid | September 9, 2015 | Download |
| Swine (Farrow-Finish, Farrow-Wean, Wean-Finish, Nursery, Finishing) | Tonsor and Reid | September 9, 2015 | Download |
| Dairy (Cow-Milking-Raised Replacements, Cow-Milking-Purchased Replacements, Replacement Heifers) | Tonsor and Reid | September 9, 2015 | Download |
| Master List of Prices Used in Livestock Budgets | Tonsor and Reid | September 9, 2015 | Download |

2014 Livestock Budget Archives are available HERE.

| Other Farm Management Guides | | Complete Farm Management Guide Index |
|---|---|---|
| Budgeting | Center-Pivot Irrigated Crops | Public Policy |
| Buildings and Improvements | Financial Management | Miscellaneous |
| Land Economics | Insurance | 2014 Livestock Budgets |
| Non-Irrigated Crops | Labor | |



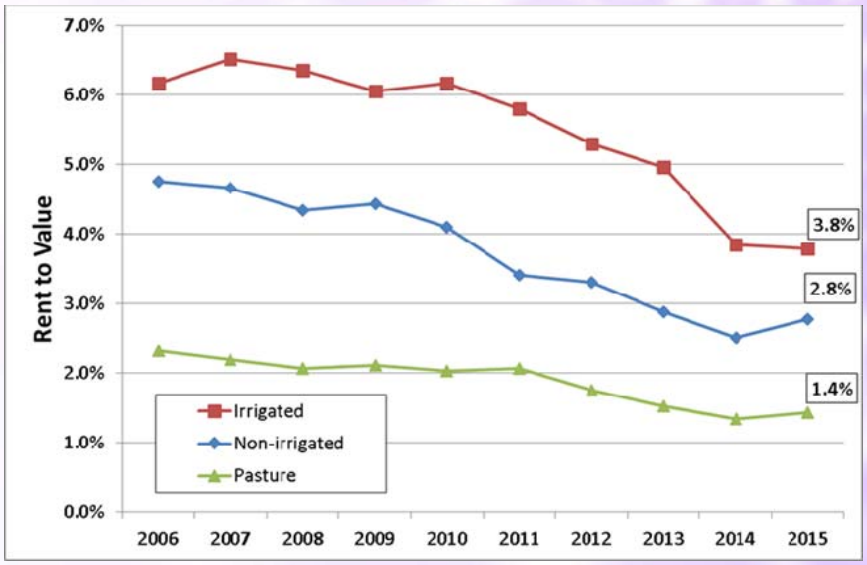
Source: www.agmanager.info

# Landowner Costs

**Land Costs**

| Category: | | | | | | $/acre | Total for Pasture | Cost Paid by Producer % | Landowner % |
|---|---|---|---|---|---|---|---|---|---|
| Water Source Maintenance | | | | | | 1.44 | $ 230.40 | 0.00% | 100.00% |
| Spraying Weeds | | | | | | $ 6.75 | $ 1,080.00 | 100.00% | 0.00% |
| Fertilizer | | | | | | $ - | $ - | 100.00% | 0.00% |
| Burning Pasture | 20.00 | *per acre* | 3 | years | = | $ 6.67 | $ 1,066.67 | 100.00% | 0.00% |
| Maintaining Fence | | | | | | $ 1.50 | $ 240.00 | 100.00% | 0.00% |
| New Fence Construction | | | | | | $ 3.89 | $ 621.76 | 0.00% | 100.00% |
| Corrals | | | | | | $ 1.03 | $ 165.00 | 100.00% | 0.00% |
| Other land costs | | | | | | $ - | $ - | 100.00% | 0.00% |
| **Total Costs** | | | | | | **$ 21.27** | **$ 3,403.82** | | |
| | | | | | | | | | |
| Interest on Land | 2,500.00 | *Land Value per acre* | 1.0% | *rent/value ratio* | = | $ 25.00 | $ 4,000.00 | | |

# Rent to Value Ratio






# Production Costs

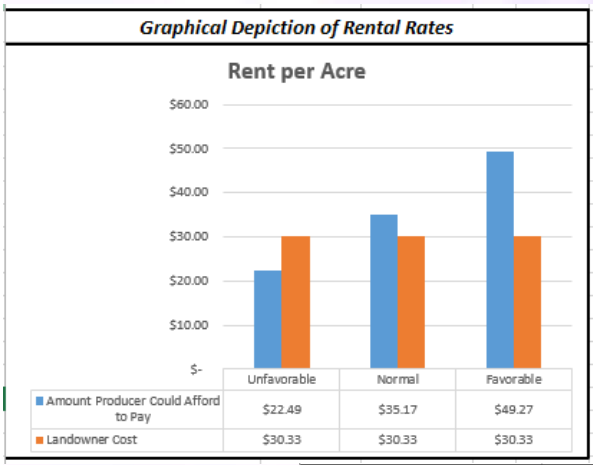
- Budgeting approach
  - Contributions to costs are calculated on shares
  - Simulate impacts from changes in lease agreement
- Start with state-level values & adjust for your area
  - Assign labor costs to landowner if they provide care
  - Study livestock costs
  - Account for fertilizer costs (tame grass)
  - Pasture care: Weed control and/or burning, etc.

# Estimated Rental Rates

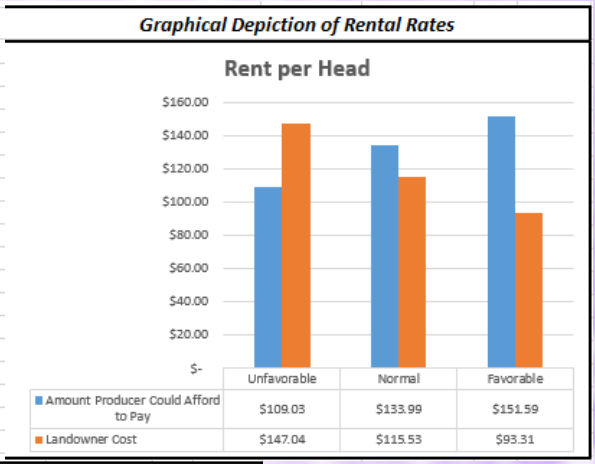
| Budgeting a Rental Rate-Stocker Cattle | | | | |
|---|---|---|---|---|
| | | Unfavorable | Normal | Favorable |
| Producers Share of Cost | | $ 6,430.61 | $ 7,136.27 | $ 7,920.35 |
| Net Income | | $ 10,028.70 | $ 12,763.80 | $ 15,802.80 |
| Return over Producer Cost | | $ 3,598.09 | $ 5,627.53 | $ 7,882.45 |
| | *Amount Producer Could Afford to Pay* | | | |
| | Rent per Acre | $ 22.49 | $ 35.17 | $ 49.27 |
| | Rent per Head | $ 109.03 | $ 133.99 | $ 151.59 |
| | Rent per Pound of Gain | $ 0.31 | $ 0.38 | $ 0.43 |
| | Rent per AUM | $ 23.45 | $ 28.53 | $ 32.69 |
| Landowner Share of Cost | | $ 4,852.16 | $ 4,852.16 | $ 4,852.16 |
| Net Income | | $ 10,028.70 | $ 12,763.80 | $ 15,802.80 |
| Return over Landowner Cost | | $ 5,176.54 | $ 7,911.64 | $ 10,950.64 |
| | *Landowner Cost* | | | |
| | Rent per Acre | $ 30.33 | $ 30.33 | $ 30.33 |
| | Rent per Head | $ 147.04 | $ 115.53 | $ 93.31 |
| | Rent per Pound of Gain | $ 0.42 | $ 0.33 | $ 0.27 |
| | Rent per AUM | $ 31.63 | $ 24.60 | $ 20.13 |

KANSAS STATE UNIVERSITY | Department of Agricultural Economics

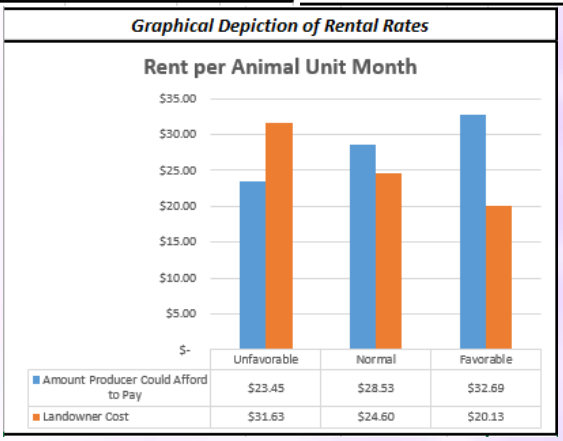
*Graphical Depiction of Rental Rates*




*Graphical Depiction of Rental Rates*




*Graphical Depiction of Rental Rates*




KANSAS STATE UNIVERSITY

# Production Risk

## Budgeting for Stocker Cattle Grazing -Production Risk

| Production Variables | | |
|---|---|---|
| Death Loss | Normal | 1.00% |
| Stocker Ending Weight | 5% lower | 902.50 |
| Stocker Selling Price | 1% lower | $148.50 |

Print all Pages

Print Production Risk Table

| *Stocker Cattle Production Risk* | Unfavorable | Normal | Favorable |
|---|---|---|---|
| Producers Share of Cost | $ 6,430.61 | $ 7,136.27 | $ 7,920.35 |
| Net Income | $ 7,230.71 | $ 9,202.73 | $ 11,393.85 |
| Return over Producer Cost | $ 800.11 | $ 2,066.45 | $ 3,473.50 |
| *Amount Producer Could Afford to Pay* | | | |
| Rent per Acre | $ 5.00 | $ 12.92 | $ 21.71 |
| Rent per Head | $ 24.25 | $ 49.20 | $ 66.80 |
| Rent per Pound of Gain | $ 0.07 | $ 0.14 | $ 0.19 |
| Rent per AUM | $ 34.41 | $ 10.48 | $ 14.41 |
| Landowner Share of Cost | $ 4,852.16 | $ 4,852.16 | $ 4,852.16 |
| Net Income | $ 7,230.71 | $ 9,202.73 | $ 11,393.85 |
| Return over Landowner Cost | $ 2,378.56 | $ 4,350.57 | $ 6,541.69 |
| *Landowner Cost* | | | |
| Rent per Acre | $ 30.33 | $ 30.33 | $ 30.33 |
| Rent per Head | $ 147.04 | $ 115.53 | $ 93.31 |
| Rent per Pound of Gain | $ 0.42 | $ 0.33 | $ 0.27 |
| Rent per AUM | $ 31.63 | $ 24.60 | $ 20.13 |

KANSAS STATE UNIVERSITY | Department of Agricultural Economics

# Cow/Calf

## Budgeting for Cow/Calf Grazing- Inputs

| Inputs from Stocking Rate Page | |
|---|---|
| Grazing Period Start | 5/1/2016 |
| Grazing Period End | 10/31/2016 |
| Grazing Days | 183 |
| Total Acres of Pasture | 160 |

| Growing Season | Unfavorable | Normal | Favorable |
|---|---|---|---|
| # of head | 15 | 20 | 24 |
| Acres per Head | 10.5 | 8.2 | 6.7 |

| Expected Cattle Returns | | Per Head |
|---|---|---|
| Cow Yearly Cost (w/o pasture) | | $ 700.00 |
| Weaning Percentage | 89% | |
| Ending Weight (lbs) | 550 | |
| Expected Ending Price ($/cwt) | $220.00 | $ 1,076.90 |
| Net Income per head | | $ 376.90 |

KANSAS STATE UNIVERSITY | Department of Agricultural Economics

# Cow/Calf

| Budgeting a Rental Rate-Cow/Calf Pairs | | | | |
|---|---|---|---|---|
| | | Unfavorable | Normal | Favorable |
| Producers Share of Cost | | $ 2,551.67 | $ 2,551.67 | $ 2,551.67 |
| Net Income | | $ 5,653.50 | $ 7,538.00 | $ 9,045.60 |
| Return over Producer Cost | | $ 3,101.83 | $ 4,986.33 | $ 6,493.93 |
| | *Amount Producer Could Afford to Pay* | | | |
| | Rent per Acre | $ 19.39 | $ 31.16 | $ 40.59 |
| | Rent per Pair | $ 206.79 | $ 249.32 | $ 270.58 |
| | Rent per AUM | $ 20.22 | $ 25.28 | $ 26.94 |
| Landowner Share of Cost | | $ 4,052.16 | $ 4,052.16 | $ 4,052.16 |
| Net Income | | $ 5,653.50 | $ 7,538.00 | $ 9,045.60 |
| Return over Landowner Cost | | $ 1,601.34 | $ 3,485.84 | $ 4,993.44 |
| | *Landowner Cost* | | | |
| | Rent per Acre | $ 25.33 | $ 25.33 | $ 25.33 |
| | Rent per Pair | $ 270.14 | $ 202.61 | $ 168.84 |
| | Rent per AUM | $ 26.41 | $ 20.54 | $ 16.81 |



# Important Points

- Landowner costs
  - Do not always cover costs, especially when rent is low (low cattle prices)
  - Tradeoff of higher management costs and better pasture productivity
- Amount tenant can afford to pay
  - Determined by their costs and revenues
  - Higher when value of gain and amount of gain high
  - Pasture productivity is valuable

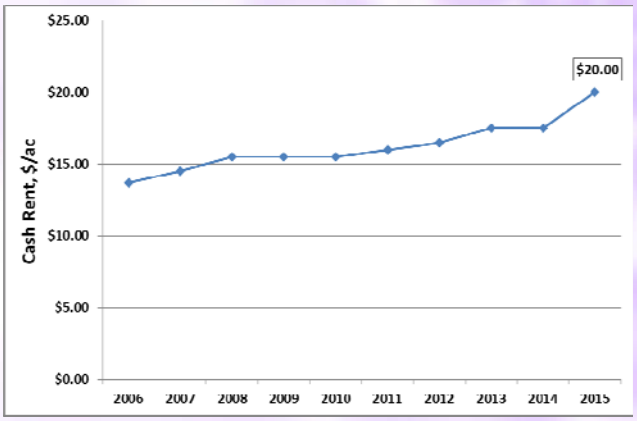
# "Afford to Pay"

- What does this term mean and why do we use it?
  - Why not build in a profit margin?
  - Already paying all costs of production, including labor, interest on capital
- If the remainder is pure profit then what happens?
  - Producers will bid away profit in the long run

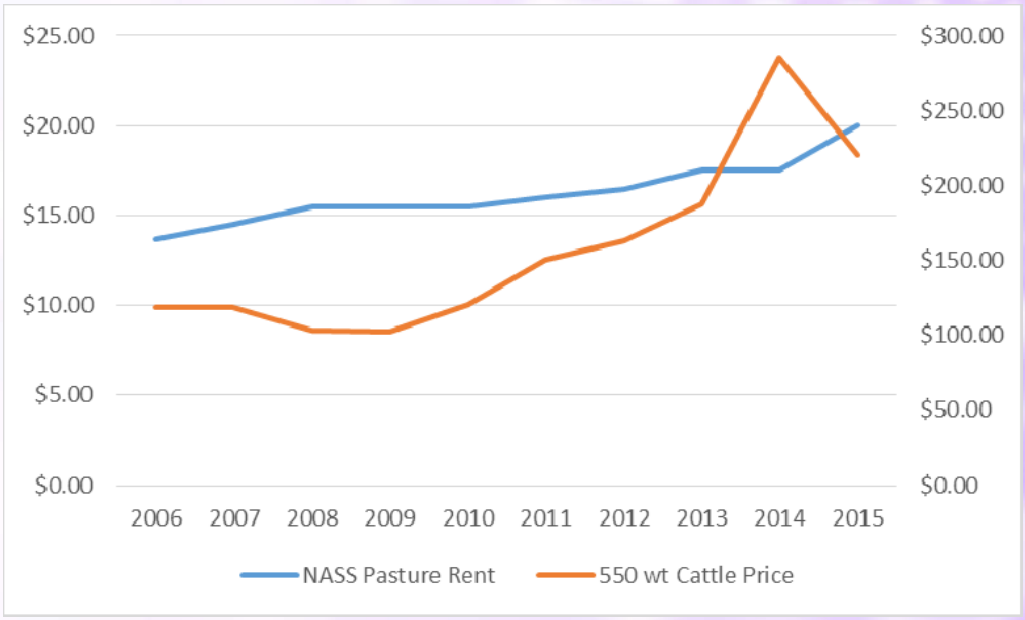


# "Afford to Pay"

- Profitability is near zero in the long run (stockers)
  - Land rents were stable to slightly increasing for many years



# Cash rent vs. Cattle Market






# Pasture Rents

- Different way to approach pasture rent questions
  - Start with assumption that not all pasture is created equal
  - Gain flexibility from changing range conditions and market prices
  - Give landowners and tenants a way to estimate the value of good pasture
- Push back
  - But what is the going rate!?!
  - Training for Extension agents, lease workshops

# Resources

- www.AgManager.info
  - Farm Management
  - Livestock Marketing
- NRCS
  - Local offices can help you determine your stocking rate
  - Will also assist with a grazing plan
- Contact information
  - Mykel Taylor: mtaylor@ksu.edu
  - Robin Reid: robinreid@ksu.edu

KANSAS STATE UNIVERSITY | Department of Agricultural Economics