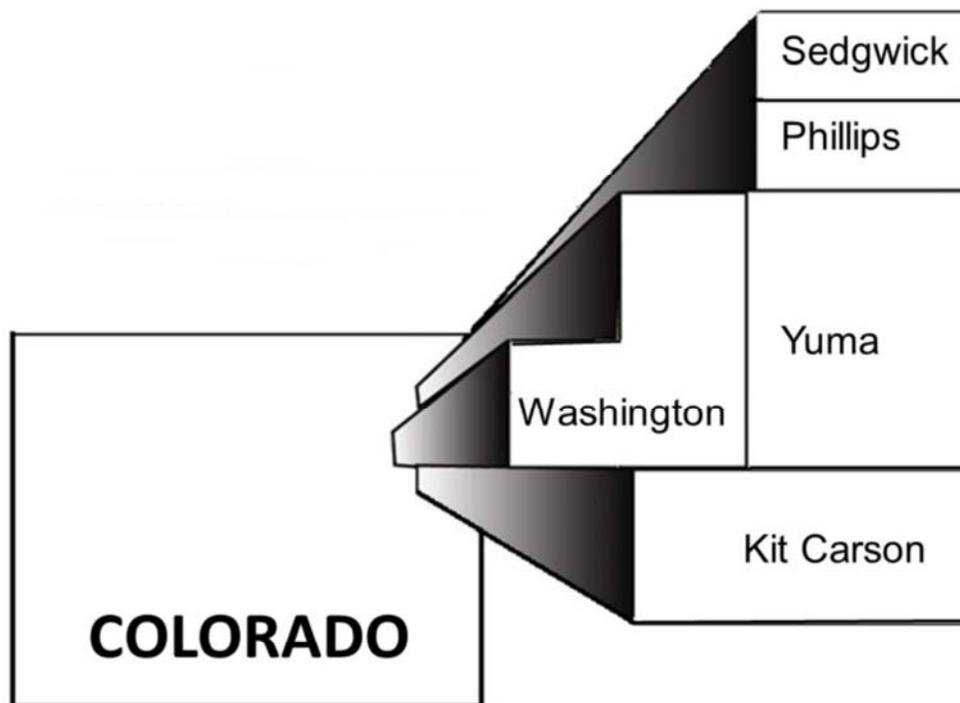


Golden Plains Area
AGRICULTURAL HANDBOOK



2018 | Volume XV
Part 2



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Golden Plains Area

AGRICULTURAL HANDBOOK

2018 | Volume XV, Part 1

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ACKNOWLEDGMENT

Golden Plains Area Extension programs and information are the result of a cooperative effort between Colorado State University and Kit Carson, Phillips, Sedgwick, Washington and Yuma counties. We wish to thank the following people for their on-going advice, support and effort in helping put this research-based information to work.

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Agriculture Handbook | One Volume Annual Publication | 2018, Volume XV

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Emerging Remote Sensing Products, *Rangeland Production Monitoring Service (RPMS)* for Managing Rangelands

Annie Overlin, Regional Rangeland Specialist

Who doesn't love looking at aerial images of their ranch? You can see your house, that hopefully permitted new addition, the cows in the pasture. Nowadays using aerial imagery is synonymous with using electric fence to cross fence. It's a tool that just makes management easier.

While staring at images of your ranch online is no substitute for walking around in your pasture, once you train your eye to interpret how specific colors and textures correspond to what is actually on the ground, it's a lot easier to gain a holistic understanding of the whole operation. I would imagine most of us who need to know how much production is in a pasture have a decent understanding of the difference between 500 lbs per acre and 2000 lbs/acre. When it comes to managing cows on range, having an accurate number of *forageable* production is essential to good grazing management. This number informs stocking rate, when to move cows, how long they can stay, and how much feed if any needs to be purchased.

Embarrassingly, there have been many times, particularly when working in 1000+ acre pastures, that I've measured a pasture based on what I thought was representative, walked a different route back to the truck and realized my measurement was not representative. So, what I've learned is to have the aerial imagery on hand and measure within different "color/texture signatures" or polygons. A good example of this on the plains is a stand of switch grass/prairie sand reed has a mottled brown signature whereas sod-bound blue grama has a light tan color and the difference in production is about 1500 lbs/acre.

What if I were to assign production values without having to measure? Over the last several years, emerging remote sensing developers across the

globe have been racing to do just that. Instead of training our eyes to interpret imagery, they're training the computer to interpret imagery. None of the developers have quite cracked the nut of accurately measuring annual production by species using remote sensing but they are getting closer. One such tool developed by the Rocky Mountain Research Station, the *Rangeland Production Monitoring Service (RPMS)* is a publicly available dataset that quantifies annual production on about 662 million acres of U.S. rangelands from 1984 to present and will be annually updated. This novel product directly links Normalized Difference Vegetation Index (NDVI) to annual production.

NDVI can come from a variety of satellite or airborne sensors or "cameras" and is useful for detecting live green plant canopies by measuring the difference between near-infrared and red (visible) light (chlorophyll in plants strongly absorbs visible light for use in photosynthesis while the cell structure of the leaves strongly reflects near-infrared light). While NDVI reflects plant cover, it does quantify plant production. RPMS takes the index a step further by using production values from a data set encompassing millions of acres over 50+ years to calibrate the index to produce annual production.

When this method was tested on the Great Plains, validation metrics included an accuracy of 89% between predicted and observed annual production. That is pretty accurate! However, though this product shows promising accuracy in predicting total annual production, it does have **limitations:**

Accuracy above 3000 lbs/acre is not sufficient due to the limitations of NDVI. This is great news for the plains of Colorado because the vast majori-

ty of our rangelands are under 3000 lbs/acre.

This product only provides total production, not *forageable* production. So, if you have 2000 lbs/acre production per acre and half of it is cheatgrass and half is western wheat, it won't tell you the difference.

How we can use it:

Back to my switchgrass/prairie reed and sod-bound blue grama pasture. RPMS developer, Matt Reeves graciously worked with me to quickly extract information from this pasture and really where the rubber met the road was when it started pumping out production values on my polygons. Not only were its values within 50 lbs of my field measurements for 2018, it gave values of the previous 34 years. What caught my eye was that sod-bound blue grama polygon (500 lbs/acre) was 850 lbs/acre dur-

ing the drought in 2002 and 1870 lbs/acre in 2003. This tool can really help inform how variable and vulnerable specific areas over the whole ranch can be over time. So, the next time I am out in a pasture, I'll use this monitoring service first to help me understand not only the production potential of the site, but how specific areas have changed.

Forage insurance- this could be a great tool to help manage risk from forage loss due to drought. The use of actual production can aid in the selection of various aspects of forage insurance such as when production normally occurs and for how much production to insure. For example, a producer would not want to purchase insurance for 2,500 lbs/acre of production if normal production is about 1,250 lbs/acre.

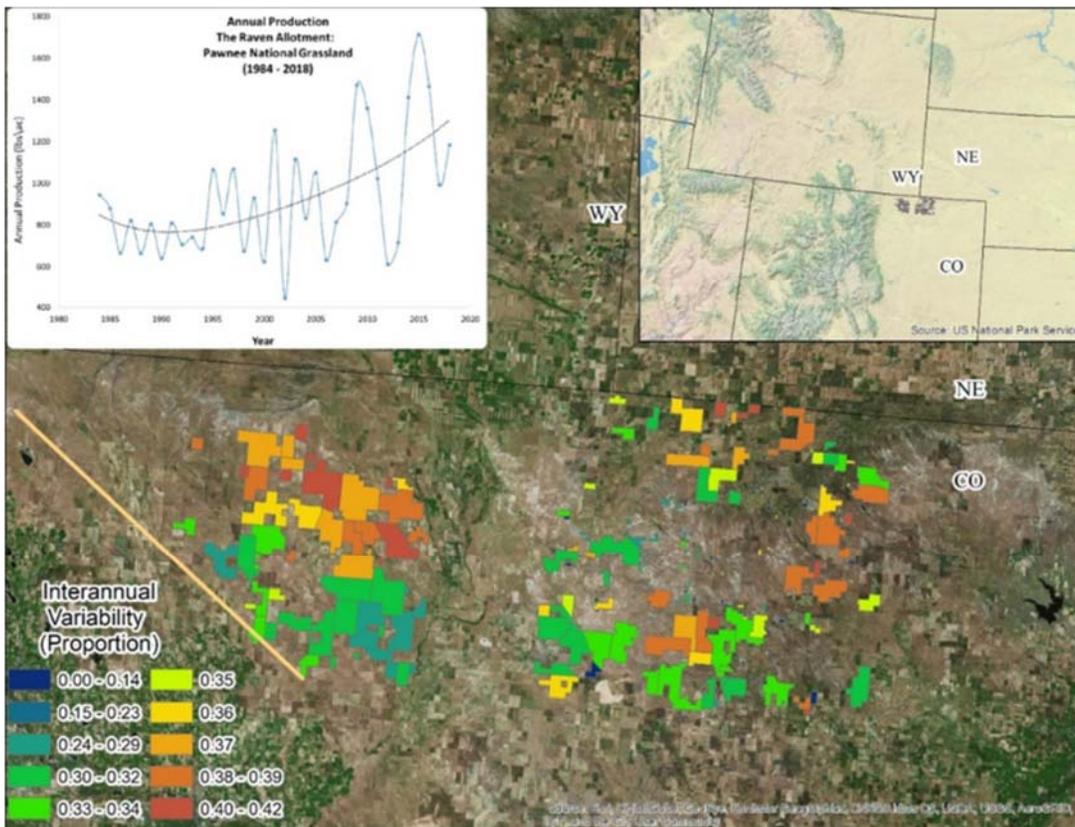


Figure 1. The aerial image left shows inter-annual variability in vegetation production (as a percent of the 34 year mean). The upper left shows how much the production one particular allotment changes over time. Note the extreme variability since about 2002 in the production estimates across the selected grazing allotment.

2018 Farm Bill Includes Changes to the Commodity Support Program

R. Brent Young, Ph.D., Regional Agriculture and Business Management Specialist

The 2018 Farm Bill or Agriculture Improvement Act of 2018 was signed into law by President Trump on December 20, 2018. The bill largely continues current farm and nutrition policy and did not markedly change the requirements for SNAP recipients. In this article I will review the major changes made to the Title 1 commodity support programs.

The three most significant changes for crop producers in the new bill are the ability to change your selection of ARC or PLC during the life of the bill, the opportunity to update PLC yields, and increases in the commodity loan rates. Producers will be able to elect ARC or PLC on a crop-by-crop and farm-by-farm basis jointly for the 2019 & 2020 years and then each year beginning in 2021.

Beginning in 2020 producers can update PLC yields based on 90% of the average yields during the 2012-2017 crop years. The average yields are then multiplied by a covered crop update factor. Those update factors for barley, corn, oats, and wheat are 0.9714, 0.90, 0.9677, and 0.9767 respectively.

Commodity loan rates have increased for barley, corn, oats and wheat to \$2.50, \$2.20, \$2.00 and \$3.38 respectively. These rates will be used for calculating Marketing Assistance Loan amounts.

The Price Loss Coverage (PLC) program was virtually unchanged in the 2018 bill. Payments are made under PLC when the **effective price** is less than the **reference price** for a covered commodity. The **effective price** is determined by the higher of the Marketing Year Average (MYA) or the national loan rate. The **reference price** is also known as the statutory price and is set by the farm bill.

The 2018 Farm Bill does include a provision to raise the reference price for covered commodities if market prices were to improve during the life of the

bill. At the time of the writing of this article, price projections over the next several years do not suggest that the reference prices for commodities produced in Colorado will increase.

Several changes were made to the Agriculture Risk Coverage (ARC) program. Payments are made under ARC-CO when **ARC-CO Actual Revenue** is less than the **ARC-CO Guarantee** for a covered commodity. **ARC-CO Actual Revenue** is determined by multiplying the county yield during the crop year by the national price for that crop year. The **ARC-CO Guarantee** is calculated by multiplying the county benchmark yield by the national benchmark price.

Changes to the ARC program in the 2018 bill include:

- ARC coverage will be determined by the location of the farm not by the location of the FSA office
- Plug yields will increase from 70% to 80%
- Effective reference price (if initiated) will be used in benchmark calculations
- Adds yield trend adjustments like crop insurance
- Requires separate guarantees for irrigated and non-irrigated yields
- Uses RMA data for calculating county yields
- Requires USDA to publish payment rates and program data in a more timely fashion

If you have questions about this topic or any other agricultural business management issue, please feel free to contact me at 970-522-7207 or by email at brent.young@colostate.edu

Using Quicken for Farm and Ranch Accounting

R. Brent Young, Ph.D., Regional Agriculture and Business Management Specialist

Quicken is a very popular accounting software package that is used by millions of Americans to track their personal finances. Many farm and ranch families have also adopted Quicken to help them keep track of their agricultural business finances. The popularity of Quicken for both personal and agricultural uses is due in part to the fact that it is user friendly, readily available, flexible, and inexpensive.

Quicken was originally designed for tracking personal finances and makes use of a single entry accounting system based on the look and feel of a common checking account register. In order to effectively use Quicken for farm and ranch accounting several modifications must be made.

Dr. Damona Doyle, Extension economist at Oklahoma State University has devoted a good part of her career to helping farm and ranch families to successfully modify Quicken for agricultural use. Dr. Doyle maintains a website that contains a Quicken for Farm/Ranch Financial Records manual that provides step by step instructions for getting the most out Quicken in agriculture. The website also contains several Quicken files that contain sample entries to allow you to learn the various techniques covered in the manual without jeopardizing your own data. The address for the website is <http://agecon.okstate.edu/quicken/>.

In addition to tracking every day income and expense entries, a good farm/ranch accounting software package should also provide the producer with three very important types of information. That information consists of; an accrual based balanced sheet, cash flow monitoring, and cost of production of crop and livestock enterprises. With the proper modification Quicken can perform these tasks.

Most farmers and ranchers are required to provide an accrual based balance sheet annually as part of a renewal package for operating loans or to maintain

other medium or long term credit. Accrual balance sheets report all assets and liabilities as well as changes in inventory values. As a cash accounting system, Quicken can be modified to track changes to the values of asset, liability, and inventory accounts as entries are made to provide real time account balances.

Cash flow monitoring has become an essential management tool in the past several years as commodity prices have declined and input cost continue to rise. Shrinking or non-existent profit margins dictate that growers are able to monitor and control production cost throughout the year. Quicken contains a planning module that allows income and expense records from the previous year to be rolled over into a current year budget. This “monthly” budget of income and expense sources can be further modified to match the cash flow statement prepared as part of an operating loan renewal package. With just a couple of key strokes on the computer a budget report with projected and actual income and expense items can be produced to effectively monitor and control production costs.

Knowing your cost of production of the commodities you produce is an integral part of effective farm/ranch management. In order to develop a marketing plan you must know your cost of production. Producers using Quicken can take advantage of the “Tag” function to correlate income and expense entries to the crop or livestock enterprise that generated the income or expense. A “Tag Report” can then be generated to determine the total expenses generated by an enterprise, that number can then be divided by the total amount of production to determine cost per unit of production. This function can also allow a producer to analyze each enterprise for profitability.

The Quicken for Farm/Ranch Financial Records manual that can be found online at <http://>

agecon.okstate.edu/quicken/ can help you learn how to develop an accrual based balanced sheet, conduct cash flow monitoring, and determine the cost of production of crop and livestock enterprises. If you have questions about this topic or any other agricultural business management issue, please feel free to contact me at 970-522-7207 or by email at brent.young@colostate.edu.

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TRACKING BASIS

R. Brent Young, Regional Agricultural and Business Management Specialist

Dennis Kaan, Golden Plains Area Director

Professional tennis players make 80% of their shots while amateur tennis players miss 80% of their shots. Given this fact the best way for an amateur tennis player to improve their game would be to eliminate their mistakes.

Many farmers consider themselves to be amateurs when it comes to marketing their grain. If you believe the tennis analogy, then it would stand to reason that the best way for farmers to improve their grain marketing ability would be to eliminate their marketing mistakes.

Edward Usset, Grain Marketing Specialist for the Center for Farm Financial Management, University of Minnesota compares tennis players to farmers as he introduces his presentation titled “Five Common Mistakes in Grain Marketing”. A list of Ed’s five mistakes include: reluctance to pre-harvest price crops, failure to understand and track local basis, failure to have an exit strategy, holding old crop grain in storage too long and using call options to avoid storage costs.

In this article I will concentrate on mistake number two, failure to understand and track local basis. Basis is the difference between the local cash price and the nearby futures price. Changes in local prices and basis are usually due to transportation cost, local storage

availability, and local supply and demand.

Despite these influences, basis is generally easier to predict than futures or cash prices over time and can be used to forecast expected future prices. For example, if December Corn futures are currently trading at \$5.59 and the average expected basis is -\$0.55, we would expect the cash price in December to be \$5.04. Variation in basis over time will result in the actual cash price being higher or lower depending on whether basis is stronger (+) or weaker (-) than expected. Assessing this variability is crucial in using basis in the marketing process. Comparing the current year’s basis to a multiple year average is one method for this assessment.

While futures prices can vary year to year and season to season, basis tends to follow similar patterns year to year. In most years basis tends to be weakest at harvest, strongest in late spring/early summer and then weakening again from late summer to harvest. Basis tend to be erratic when supplies are tight and futures markets are inverted.

In many cases grain pricing opportunities are the result of changes in basis and not upward movement in the futures market. Many times producers are fixated on the day to day changes in futures prices and miss pricing opportunities when local basis narrows. Using

an online basis monitoring tool can be helpful to monitor your local basis. One free tool is located on the Ag Web site provided by Farm Journal Magazine.

If you are interested in tracking local wheat basis, I would suggest that you utilize the Kansas State University Interactive Basis Tool <https://www.agmanager.info/grain-marketing/interactive-crop-basis-tool>. This web based tool tracks most of the grain markets in eastern Colorado and will also provide 3 and 5 year weekly averages. Many market analysts are recommending that producers use 3 year over 5 year averages. The current 5 year averages still contain data from unusually high price or wide basis years that tend to skew the averages.

While most producers use basis data to predict the final price received for grain that has been hedged with a futures or options contract, basis information can also be used to evaluate forward contract opportunities. Most of the websites of grain merchandising companies

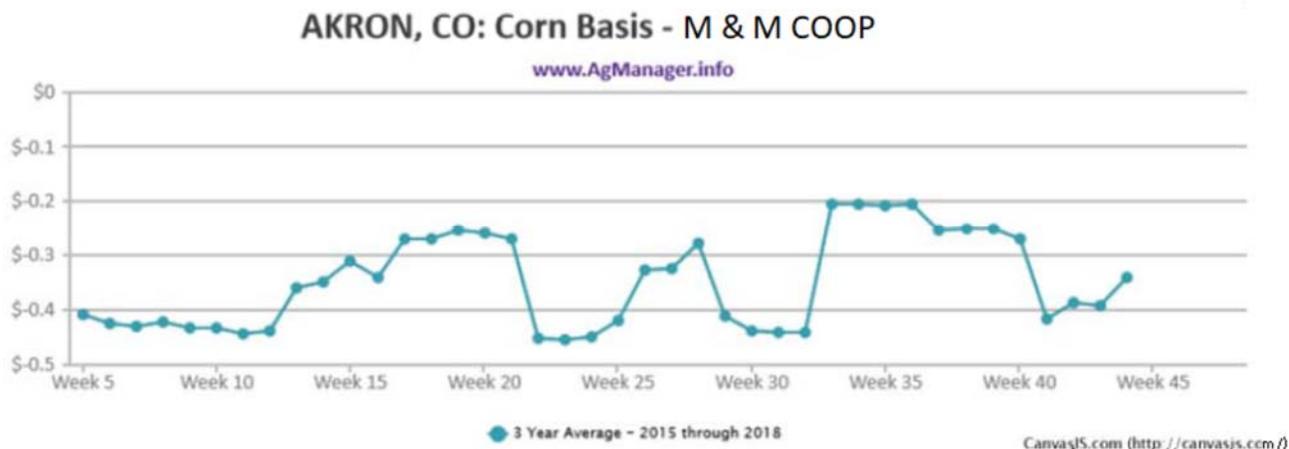
will include the futures price and basis used to determine the forward contract bid. The savvy producer will compare the basis level with the 3 year average at the time of delivery to determine if the contract basis is reasonable.

If you're like many grain producers and feel that when it comes to marketing you are more of an amateur than a professional tracking your local basis could pay big dividends.

If you have questions about this topic or any other agricultural business management issue, please feel free to contact me at 970-522-7207 ext.6 or by email at brent.young@colostate.edu

The following graphs represent three year averages for corn and hard red winter wheat basis for select elevators in the Golden Plains Area where data is available. Data is available for additional locations using the Interactive Crop Basis Tool at the URL discussed previously.

Three Year Average Corn Basis Charts for Selected Golden Plains Area Locations



HAXTUN , CO: Corn Basis - GRAINLAND COOP

www.AgManager.info



CanvasJS.com (<http://canvasjs.com/>)

JULESBURG, CO: Corn Basis - GRAINLAND COOP

www.AgManager.info



CanvasJS.com (<http://canvasjs.com/>)

SEIBERT , CO: Corn Basis - SEIBERT EQUITY COOP

www.AgManager.info



CanvasJS.com (<http://canvasjs.com/>)

YUMA, CO: Corn Basis - M & M COOP

www.AgManager.info



Three Year Average Wheat Basis Charts for Selected Golden Plains Area Locations

AKRON, CO: Hard Red Winter Wheat Basis - M & M COOP

www.AgManager.info



FLAGLER, CO: Hard Red Winter Wheat Basis - FLAGLER COOPERATIVE ASSOCIATION

www.AgManager.info



YUMA, CO: Hard Red Winter Wheat Basis - M & M COOP

www.AgManager.info



CanvasJS.com (<http://canvasjs.com/>)

CROP ENTERPRISE COST ESTIMATES FOR 2018 IN NORTHEASTERN COLORADO

Brent Young – Regional Agriculture and Business Management Specialist

Introduction

Estimated production costs and returns for the major crops grown in Northeastern Colorado are included in this section for 2016. It would only be fair to call the following cost of production estimates, or budgets, “typical” and hopefully representative of the area. These budgets are not averages, but rather represent typical costs as reported by producers in Northeastern Colorado and from data provided by the USDA-NASS Colorado field office. These budgets represent no one single individual, as all producers are different with unique management techniques, machinery complements, chemical applications, market timing and uncontrollable fortune with frost, hail, rain and insects. No attempt was made to conform these results to ideal production recommendations. Our goal is simply to report typical production costs from actual production.

These cost of production estimates conformed to the traditional economic method of accounting for all variable and fixed costs of production. Starting in 2006, the Mississippi State Budget generator became the software of choice to develop the enterprise budgets. Expected returns on land are capitalized using a capitalization rate based on the “real” rate of interest, which is the rate of interest paid minus the inflation rate. Net receipts need to be large enough to give the operator a four percent return on the land investment. If receipts are large enough to cover these items, the operator then has a positive return to management and risk. From a business management standpoint, farmers must earn positive receipts in order to provide for family living expenses, pay debt, earn positive returns on their investments and make new investments when feasible.

Variability in Input Use and Conditions

Caution is urged when using these ‘typical’ produc-

tion cost and return estimates. This is especially true for agricultural lenders, appraisers, insurance adjusters, landlords and government agencies. Even among this survey group, which was pre-screened to be typical of the area, there were great differences. These differences were seldom due to good or bad management, but rather due to a variety of weather and pest conditions, soils, and irrigation management.

Table 1 lists typical fertilizer rates for the crops specified in this publication. Again, these rates are not meant to be recommendations for fertilizer requirements, but rather are typical rates reported by producers participating in the survey process. Also, the survey instrument does not inquire as to the usage of soil testing by producers for plant nutrients. As a result, no correlation can be made between the typical fertilizer rate reported and actual plant nutrient requirements.

In addition to crop yield and input rates, the survey instrument sent to producers asked for cultural practices, machinery compliments and machinery values. Machine cost variability from one producer to the next was often impacted by management choices. An operator that chooses to purchase newer machinery may feel they realize enough from increased dependability and lower repair costs that the extra investment is warranted. The typical machine complement in use is 7 to 15 years of age. When replacement machines are purchased they are not always new. As stated previously, positive returns to “management and risk” would have to be used to initiate replacement machinery purchases if that is a management priority.

Price Received

As always, a key management perspective for producers will be to pay close attention to production costs, marketing plans and price information. This is especially important in the current environment of

rising commodity prices as production costs, and land rents have begun to rise again as well, putting pressure on profits in future years if commodity prices fall below their current levels. All local commodity prices were above FSA established loan rates for the 2016 marketing year. Table 2 presents a summary of the county loan rates for the Golden Plains Area.

Estimated Production Costs and Returns for Irrigated Crops

Tables 3 through 9 describe enterprise production costs and returns for irrigated crops in Northeastern Colorado. These enterprises include alfalfa, dry edible beans, corn, sugar beets, oil sunflowers, soybeans and winter wheat. All irrigated budgets are produced under center pivot irrigation. The alfalfa enterprise is assumed to be in production 5 years. Alfalfa establishment costs are amortized over a 5-year time period as a result. Crop rotations for dry bean production typically assumed production once every three or four years. Crop rotations that include sugar beets typically assumed production of these crops once every four years. Corn was the crop typically used to fill out the rotations. Tables 9, 10, and 11 describe irrigated corn, sugar beet, and winter wheat enterprises for the South Platte River valley. These enterprises also assume center pivot irrigation and sugar beet production once every four years.

Estimated Production Costs and Returns for Dryland Crops

Many dryland producers are adopting a two crop in three-year system such as wheat-corn-fallow, wheat-sunflower-fallow, or wheat-millet-fallow. As a result there are two dryland winter wheat budgets defined

in this report. Table 12, the conventional wheat-fallow budget, charges all fallow costs against the wheat crop, employing traditional tillage operations for weed control in the fallow period. Tables 13 through 16 describe reduced-till intensive cropping system enterprises for winter wheat, corn, millet, and oil-type sunflowers. In these reduced-till intensive cropping system budgets, fallow expenses from wheat harvest to summer crop planting (9 months) are charged to the summer crop enterprise. Fallow expenses from summer crop harvest to wheat planting (11 months) are charged to the wheat enterprise. Fallow operations include a combination of herbicide use and tillage operations for weed control in the reduced-till budgets.

The breakeven analysis feature at the bottom of each budget allows us to see the per acre bottom line effect of positive or negative changes in price and/or yield while holding all inputs constant. By matching various different scenarios in this way, we can get a feeling for the relative production and marketing risks of each crop enterprise. In Table 5 - Irrigated Corn, price received was \$3.70/bushel while quantity harvested was 260 bushel/acre. For the 2015 crop year, this combination results in \$303.96 net receipts per acre before factor payments (Row 3, Column 3). The result of a 25% reduction in yield holding price constant at \$3.70/bushel is \$63.46 per acre returns over direct costs, a net loss of \$240.50 per acre, (Row 1, Column 3). It should be noted that the 25% (+/-) ranges shown in these tables are meant for illustration purposes only and do not represent the worst or best case scenarios for any crop enterprise.

Table 1. Typical Fertilizer Application Rates for Irrigated and Dryland Crops.

	Nitrogen (N)¹	Phosphate (P)¹	Potassium (K)¹
	Lbs/Acre	Lbs/Acre	Lbs/Acre
Irrigated Crops			
Corn	218	45	15
Sugar Beets	160	35	0
Pinto Beans	52	65	16
Winter Wheat	60	12	0
Potatoes	280	148	150
Alfalfa	65	60	73
Corn, South Platte Valley	175	30	50
Sugar Beets, South Platte Valley	120	35	60
Dryland Crops			
Winter Wheat	40	12	0
Corn	60	32	24
Oil Sunflowers	50	10	0
Millet	25	0	0

¹ These values are typical rates reported by producers participating in the survey process and are not meant to be recommendations for fertilizer requirements.

Table 2. National Loan Rates for Wheat, Corn, Sunflowers and Soybeans (2018 Crop Year)

Crop	Unit	Average	Kit Carson	Phillips	Sedgwick	Washington	Yuma
Wheat	\$/Bu	3.09	2.80	2.79	3.14	3.39	3.34
Corn	\$/Bu	2.26	2.28	2.21	2.21	2.34	2.26
Sunflower	\$/Cwt	10.84	10.96	10.81	10.74	10.81	10.89
Soybeans	\$/Bu	5.87	5.93	5.84	5.84	5.84	5.93

Table 3. Northeastern Colorado - Irrigated Alfalfa

2018

Estimated Production Costs & Returns

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PERTON	
Alfalfa (Round Bales)	tons	\$203.75	6	\$1,223	\$203.75	Your Farm
Your Farm	tons			\$0.00	\$0.00	\$0.00
Gross Receipts				\$1,223		\$0
DIRECT COSTS						
	UNIT	COST PER			YOUR	
		UNIT	QUANTITY	PER ACRE	PERTON	FARM
OPERATING PREHARVEST						
Seed						
Establishment Allocation (5 yrs)	dollars	34.03	1.00	34.03	5.67	
Crop Protection						
Fertilizer	dollars	64.63	1	64.63	10.77	
Herbicide	acre	24.15	1	24.15	4.03	
Custom Application	dollars	7.00	1	7.00	1.17	
Insecticide	dollars	17.31	1	17.31	2.89	
Irrigation						
Irrigation Energy	dollars	70.34	1	70.34	11.72	
Irrigation Repairs	acre	11.58	1	11.58	1.93	
Sprinkler Lease	dollars	67.20	1	67.20	11.20	
Custom Aerial Spray	dollars	7.50	1	7.50	1.25	
Interest (6 months @ 6.25%)	dollars	9.49	1	9.49	1.58	
Total Pre-Harvest Expenses				\$313.23	\$52.21	\$0.00
HARVEST COSTS						
Fuel	dollars	2.70	1	2.70	0.45	
Repair & Maintenance	dollars	9.12	1	9.12	1.52	
Labor	dollars	4.74	1	4.74	0.79	
Baling ¹	dollars	96.00	1	96.00	16.00	
Hauling/Stacking ²	dollars	28.00	1	28.00	4.67	
Total Harvest Costs				\$140.56	\$23.43	\$0.00
Total Operating Costs				\$453.79	\$75.63	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	1.68	
Machinery Ownership Costs	dollars	54.37	1	16.43	2.74	
Real Estate Taxes	dollars	16.66	1	16.66	2.78	
Total Property & Ownership Costs				\$43.19	\$7.20	\$0.00
TOTAL DIRECT COSTS				\$496.98	\$82.83	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$725.52	\$120.92	\$0.00
FACTOR PAYMENTS						
Land (\$4,600 @ 4%)				184.00	30.67	
RETURN TO MANAGEMENT & RISK				\$541.52	\$90.25	\$0.00

1 Baling= \$12/Bale (Round Baler)

2 Hauling/Stacking= \$3.50/Bale

3 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)

ALTERNATIVE YIELDS		ALTERNATIVE PRICES (\$/ton)				
		-25%	-10%	10%	25%	
		\$152.81	\$183.38	\$203.75	\$224.13	\$254.69
-25%	4.50	\$190.67	\$328.21	\$419.89	\$511.58	\$649.11
-10%	5.40	\$328.21	\$493.24	\$603.27	\$713.29	\$878.33
TONS	6.00	\$419.89	\$603.27	\$725.52	\$847.77	\$1,031.14
10%	6.60	\$511.58	\$713.29	\$847.77	\$982.24	\$1,183.96
25%	7.50	\$649.11	\$878.33	\$1,031.14	\$1,183.96	\$1,413.17

Table 4. Northeastern Colorado - Irrigated Corn

2018

Estimated Production Costs & Returns

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER BU	
Corn	bu	\$3.52	201	\$708	\$3.52	Your Farm
Your Farm	bu			\$0	\$0.00	\$0
Farm Bill payments were not included due to great variability between counties covered by this budget						
Gross Receipts				\$708		\$0
DIRECT COSTS						
	UNIT	COST PER		PER ACRE	PER BU	YOUR FARM
		UNIT	QUANTITY			
OPERATING PREHARVEST						
Seed						
Seed	acre	121.02	1.00	121.02	0.60	
Fertilizer						
N + P	dollars	102.15	1	102.15	0.51	
Custom Application	acre	8.00	1	8.00	0.04	
Herbicide						
Chemicals	dollars	25.19	1	25.19	0.13	
Insecticide & Fungicide						
Chemicals	dollars	20.02	1	20.02	0.10	
Irrigation						
Sprinkler Ownership	dollars	67.20	1	67.20	0.33	
Sprinkler Energy	acre	60.45	1	60.45	0.30	
Irrigation Repairs	dollars	68.69	1	68.69	0.34	
Labor	hours	9.21	1	9.21	0.05	
Crop Consultant	acre	12.00	1	12.00	0.06	
Crop Insurance	dollars	44.94	1	44.94	0.22	
Fuel	dollars	12.82	1	12.82	0.06	
Repairs & Maintenance	dollars	8.03	1	8.03	0.04	
Interest (6 months @ 6.25%) ²	dollars	17.49	1	17.49	0.09	
Total Pre-Harvest Expenses				\$577.21	\$2.87	\$0.00
HARVEST COSTS						
Fuel	dollars	4.18	1	4.18	0.02	
Repair & Maintenance	dollars	5.38	1	5.38	0.09	
Labor	dollars	1.81	1	1.81	0.01	
Hauling ¹	bu	40.20	1	40.20	0.20	
Total Harvest Costs				\$51.57	\$0.26	\$0.00
Total Operating Costs				\$628.78	\$3.13	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.05	
Machinery Ownership Costs	dollars	54.37	1	54.37	0.27	
Real Estate Taxes	dollars	15.57	1	15.57	0.08	
Total Property & Ownership Costs				\$80.04	\$0.40	\$0.00
TOTAL DIRECT COSTS				\$708.82	\$3.53	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				(\$1.30)	(\$0.01)	\$0.00
FACTOR PAYMENTS						
Land (\$4,600 @ 4%)				184.00	0.92	
RETURN TO MANAGEMENT & RISK				(\$185.30)	(\$0.92)	\$0.00

1 Hauling Machinery & Labor Charges= \$0.20/Bushel

2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

BREAK-EVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)

		ALTERNATIVE PRICES (\$/bushel)					
		-25%	-10%	10%	25%		
ALTERNATIVE YIELDS	-25%	150.75	(\$310.84)	(\$291.25)	(\$178.18)	(\$125.12)	(\$45.52)
	-10%	180.90	(\$231.25)	(\$195.73)	(\$72.05)	(\$8.38)	\$87.14
	201.00	201.00	(\$178.18)	(\$72.05)	(\$1.30)	\$89.45	\$175.58
	10%	221.10	(\$125.12)	(\$8.38)	\$89.45	\$147.28	\$264.02
	25%	251.25	(\$45.52)	\$87.14	\$175.58	\$264.02	\$396.68

Table 5. Northeastern Colorado - Irrigated Oil Sunflowers

2018

Estimated Production Costs & Returns

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER CWT	
Sunflowers	CWT	\$16.69	35	\$584.15	\$16.69	Your Farm
Your Farm	CWT			\$0.00	\$0.00	\$0.00
Farm Bill payments were not included due to great variability between counties covered by this budget						
Gross Receipts				\$584.15		\$0

DIRECT COSTS						
	UNIT	COST PER			YOUR FARM	
		UNIT	QUANTITY	PER ACRE	PER CWT	
OPERATING PREHARVEST						
Seed						
Seed	dollars	38.29	1.00	38.29	1.09	
Crop Protection						
Fertilizer	dollars	26.94	1	26.94	0.77	
Herbicide	dollars	47.64	1	47.64	1.36	
Custom Application	dollars	7.00	2	14.00	0.40	
Insecticide	dollars	16.14	1	16.14	0.46	
Irrigation						
Irrigation Energy	dollars	40.01	1	40.01	1.14	
Irrigation Repairs	dollars	11.62	1	11.62	0.33	
Sprinkler Lease	dollars	67.20	1	67.20	1.92	
Crop Insurance	dollars	37.37	1	37.37	1.07	
Custom Aerial Application	dollars	8.50	1	8.50	0.24	
Crop Consultant	dollars	12.00	1	12.00	0.34	
Fuel	dollars	2.77	1	2.77	0.08	
Repair & Maintenance	dollars	1.94	1	1.94	0.06	
Labor	dollars	5.30	1	5.30	0.15	
Interest (6 months @ 6.25%) ²	dollars	10.09	1	10.09	0.29	
Total Pre-Harvest Expenses				\$339.81	\$9.71	\$0.00
HARVEST COSTS						
Fuel	dollars	4.51	1	4.51	0.13	
Repair & Maintenance	dollars	4.76	1	4.76	0.14	
Labor	dollars	1.19	1	1.19	0.03	
Hauling ¹	dollars	8.75	1	8.75	0.25	
Total Harvest Costs				\$19.21	\$0.55	\$0.00
Total Operating Costs				\$359.02	\$10.26	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.29	
Machinery Ownership Costs	dollars	18.52	1	18.52	0.53	
Real Estate Taxes	dollars	11.45	1	11.45	0.33	
Total Property & Ownership Costs				\$40.07	\$1.14	\$0.00
TOTAL DIRECT COSTS				\$399.09	\$11.40	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$185.07	\$5.29	\$0.00
FACTOR PAYMENTS						
Land (\$4,600 @ 4%)				184.00	5.26	
RETURN TO MANAGEMENT & RISK				\$1.07	\$0.03	\$0.00

1 Hauling Machinery & Labor Charges = \$0.25/Cwt

2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)						
		ALTERNATIVE PRICES (\$/cwt)				
		-25%	-10%	10%	25%	
ALTERNATIVE YIELDS		\$12.52	\$15.02	\$16.69	\$18.36	\$20.86
-25%	26.25	(\$70.50)	(\$4.78)	\$39.03	\$82.84	\$148.56
-10%	31.50	(\$4.78)	\$74.08	\$126.65	\$179.22	\$258.08
CWT	35.00	\$39.03	\$126.65	\$185.07	\$243.48	\$331.10
10%	38.50	\$82.84	\$179.22	\$243.48	\$307.74	\$404.12
25%	43.75	\$148.56	\$258.08	\$331.10	\$404.12	\$513.65

Table 6. Northeastern Colorado - Irrigated Pinto Beans

2018

Estimated Production Costs & Returns

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER CWT	
Pinto Beans	cwt	\$29.40	35	\$1,029	\$29.40	Your Farm
Your Farm	cwt			\$0.00	\$0.00	\$0.00
Gross Receipts				\$1,029		\$0
DIRECT COSTS						
	UNIT	COST PER				YOUR FARM
		UNIT	QUANTITY	PER ACRE	PER CWT	
OPERATING PREHARVEST						
Seed						
Seed	acre	49.82	1.00	49.82	1.42	
Fertilizer						
N + P	dollars	99.93	1	99.93	2.86	
Custom Aerial Spray	acre	8.00	1	8.00	0.23	
Herbicide						
Chemicals	dollars	33.00	1	33.00	0.94	
Custom Application	acre	8.00	1	8.00	0.23	
Insecticide & Fungicide						
Chemicals	dollars	31.28	1	31.28	0.89	
Irrigation						
Sprinkler Ownership	dollars	70.00	1	70.00	2.00	
Sprinkler Energy	acre	49.07	1	49.07	1.40	
Irrigation Repairs	dollars	11.89	1	11.89	0.34	
Labor	hours	4.00	1	4.00	0.11	
Crop Consultant	acre	12.00	1	12.00	0.34	
Crop Insurance	dollars	29.46	1	29.46	0.84	
Fuel	dollars	7.82	1	7.82	0.22	
Repairs & Maintenance	dollars	5.67	1	5.67	0.16	
Interest (6 months @ 6.25%)	dollars	13.12	1	13.12	0.37	
Total Pre-Harvest Expenses				\$433.06	\$12.37	\$0.00
HARVEST COSTS						
Fuel	dollars	15.71	1	15.71	0.45	
Repair & Maintenance	dollars	8.99	1	8.99	0.26	
Labor	dollars	6.64	1	6.64	0.19	
Hauling	bu	8.05	1	8.05	0.23	
Total Harvest Costs				\$39.39	\$1.13	\$0.00
Total Operating Costs				\$472.45	\$13.50	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.29	
Machinery Ownership Costs	dollars	61.86	1	61.86	1.77	
Real Estate Taxes	dollars	15.57	1	15.57	0.44	
Total Property & Ownership Costs				\$87.53	\$2.50	\$0.00
TOTAL DIRECT COSTS				\$559.98	\$16.00	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$469.02	\$13.40	\$0.00
FACTOR PAYMENTS						
Land (\$4,600 @ 4%)				184.00	5.26	
RETURN TO MANAGEMENT & RISK				\$285.02	\$8.14	\$0.00
BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)						
		ALTERNATIVE PRICES (\$/cwt)				
		-25%	-10%	10%	25%	
ALTERNATIVE YIELDS		\$22.05	\$26.46	\$29.40	\$32.34	\$36.75
-25%	26.25	\$18.83	\$134.59	\$211.77	\$288.94	\$404.70
-10%	31.50	\$134.59	\$273.51	\$366.12	\$458.73	\$597.64
CWT PER ACRE	35.00	\$211.77	\$366.12	\$469.02	\$571.92	\$726.27
10%	38.50	\$288.94	\$458.73	\$571.92	\$685.11	\$854.89
25%	43.75	\$404.70	\$597.64	\$726.27	\$854.89	\$1,047.83

Table 7. Northeastern Colorado - Irrigated Soybeans

2018

Estimated Production Costs & Returns

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER BU	
Soybeans	bu	\$8.79	55	\$483.45	\$8.79	Your Farm
Your Farm	bu			\$0.00	\$0.00	\$0.00
Farm Bill payments were not included due to great variability between counties covered by this budget						
Gross Receipts				\$483.45		\$0
DIRECT COSTS						
	UNIT	COST PER		PER ACRE	PER BU	YOUR FARM
		UNIT	QUANTITY			
OPERATING PREHARVEST						
Seed						
Seed	dollars	53.78	1.00	53.78	0.98	
Crop Protection						
Fertilizer	dollars	9.42	1	9.42	0.17	
Herbicide	dollars	31.48	1	31.48	0.57	
Irrigation						
Irrigation Energy	dollars	52.44	1	52.44	0.95	
Irrigation Repairs	dollars	11.89	1	11.89	0.22	
Sprinkler Lease	dollars	70.00	1	70.00	1.27	
Custom Application	dollars	14.00	2	28.00	0.51	
Crop Insurance	dollars	49.49	1	49.49	0.90	
Crop Consultant	dollars	12.00	1	12.00	0.22	
Fuel	dollars	6.50	1	6.50	0.12	
Repair & Maintenance	dollars	4.76	1	4.76	0.09	
Labor	dollars	3.36	1	3.36	0.06	
Interest (6 months @ 6.25%) ²	dollars	9.97	1	9.97	0.18	
Total Pre-Harvest Expenses				\$343.09	\$6.24	\$0.00
HARVEST COSTS						
Fuel	dollars	3.81	1	3.81	0.07	
Repair & Maintenance	dollars	3.15	1	3.15	0.06	
Labor	dollars	1.88	1	1.88	0.03	
Hauling ¹	dollars	11.00	1	11.00	0.20	
Total Harvest Costs				\$19.84	\$0.36	\$0.00
Total Operating Costs				\$362.93	\$6.60	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.18	
Machinery Ownership Costs	dollars	32.47	1	32.47	0.59	
Real Estate Taxes	dollars	5.85	1	5.85	0.11	
Total Property & Ownership Costs				\$48.42	\$0.88	\$0.00
TOTAL DIRECT COSTS				\$411.35	\$7.48	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$72.10	\$1.31	\$0.00
FACTOR PAYMENTS						
Land (\$4,600 @ 4%)				184.00	3.35	
RETURN TO MANAGEMENT & RISK				(\$111.90)	(\$2.03)	\$0.00

1 Hauling Machinery & Labor Charges= \$0.20/Bushel

2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)						
		ALTERNATIVE PRICES (\$/bushel)				
		-25%	-10%	10%	25%	
ALTERNATIVE YIELDS		\$6.59	\$7.91	\$8.79	\$9.67	\$10.99
-25%	41.25	(\$199.41)	(\$85.02)	(\$48.77)	(\$12.51)	\$41.88
-10%	49.50	(\$85.02)	(\$19.76)	\$23.75	\$67.26	\$132.53
BUSHEL PER ACRE	55.00	(\$48.77)	\$23.75	\$72.10	\$120.44	\$192.96
10%	60.50	(\$12.51)	\$67.26	\$120.44	\$173.62	\$253.39
25%	68.75	\$41.88	\$132.53	\$192.96	\$253.39	\$344.04

Table 8. Northeastern Colorado - Irrigated Sugar Beets

2018

Estimated Production Costs & Returns

GROSS RECEIPTS FROM PRODUCTION							
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER TON		
Sugar Beets	ton	\$35.00	34	\$1,190	\$35.00	Your Farm	
Your Farm	ton			\$0.00	\$0.00	\$0.00	
Gross Receipts				\$1,190		\$0	
DIRECT COSTS							
	UNIT	COST PER		PER ACRE	PER TON	YOUR FARM	
		UNIT	QUANTITY				
OPERATING PREHARVEST							
Seed							
Seed	acre	178.36	1.00	178.36	5.25		
Fertilizer							
N + P	dollars	98.10	1	98.10	2.89		
Custom Application	acre	7.00	1	7.00	0.21		
Herbicide							
Chemicals	dollars	62.04	1	62.04	1.82		
Custom Application	acre	7.00	1	7.00	0.21		
Insecticide & Fungicide							
Chemicals	dollars	28.20	1	28.20	0.83		
Irrigation							
Sprinkler Ownership	dollars	70.00	1	70.00	2.06		
Sprinkler Energy	acre	46.50	1	46.50	1.37		
Irrigation Repairs	dollars	12.30	1	12.30	0.36		
Labor	hours	10.57	1	10.57	0.31		
Crop Consultant	acre	12.00	1	12.00	0.35		
Crop Insurance	dollars	3.30	1	3.30	0.10		
Fuel	dollars	14.97	1	14.97	0.44		
Repairs & Maintenance	dollars	12.98	1	12.98	0.38		
Retained Revenue	dollars	85.00	1	85.00	2.50		
Interest (6 months @ 6.25%)	dollars	17.60	1	17.60	0.52		
Total Pre-Harvest Expenses				\$665.92	\$19.59	\$0.00	
HARVEST COSTS							
Fuel	dollars	19.81	1	19.81	0.58		
Repair & Maintenance	dollars	93.95	1	93.95	2.76		
Labor	dollars	9.72	1	9.72	0.29		
Hauling	bu	137.00	1	137.00	4.03		
Total Harvest Costs				\$260.48	\$7.66	\$0.00	
Total Operating Costs				\$926.40	\$27.25	\$0.00	
PROPERTY & OWNERSHIP COSTS							
General Farm Overhead	dollars	30.30	1	30.30	0.89		
Machinery Ownership Costs	dollars	136.20	1	136.20	4.01		
Payment on Coop Shares	dollars	28.50	1	28.50	0.84		
Real Estate Taxes	dollars	15.57	1	15.57	0.46		
Total Property & Ownership Costs				\$210.57	\$6.19	\$0.00	
TOTAL DIRECT COSTS				\$1,136.97	\$33.44	\$0.00	
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$53.03	\$1.56	\$0.00	
FACTOR PAYMENTS							
Land (\$4,600 @ 4%)				184.00	5.41		
RETURN TO MANAGEMENT & RISK				(\$130.97)	(\$3.85)	\$0.00	
BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)							
		ALTERNATIVE PRICES (\$/ton)					
		-25%	-10%	10%	25%		
ALTERNATIVE YIELDS	-25%	25.50	\$26.25	\$31.50	\$35.00	\$38.50	\$43.75
	-10%	30.60	(\$467.60)	(\$333.72)	(\$244.47)	(\$155.22)	(\$21.35)
	10%	34.00	(\$333.72)	(\$173.07)	(\$65.97)	\$41.13	\$201.78
	25%	37.40	(\$244.47)	(\$65.97)	\$53.03	\$172.03	\$350.53
	34.00	42.50	(\$155.22)	\$41.13	\$172.03	\$302.93	\$499.28
		(\$21.35)	\$201.78	\$350.53	\$499.28	\$722.40	

Table 9. Northeastern Colorado - Dryland Winter Wheat Conventional Till- Fallow Rotation

Estimated Production Costs & Returns 2018

GROSS RECEIPTS FROM PRODUCTION

GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER BU	
Hard Red Winter Wheat	bu	\$4.49	45	\$202.05	\$4.49	Your Farm
Your Farm	bu			\$0.00	\$0.00	\$0.00
Farm Bill payments were not included due to great variability between counties covered by this budget						
Total Receipts				\$202.05		\$0

DIRECT COSTS

	UNIT	COST PER			YOUR	
		UNIT	QUANTITY	PER ACRE	PER BU	FARM
OPERATING PREHARVEST						
Seed						
Seed	dollars	8.54	1.00	8.54	0.19	
Crop Protection						
Fertilizer	dollars	26.49	1	26.49	0.59	
Fungicide	dollars	16.35	1	16.35	0.36	
Herbicide	dollars	9.57	1	9.57	0.21	
Custom Application	dollars	7.00	1	7.00	0.16	
Crop Insurance	dollars	31.68	1	31.68	0.70	
Fuel	dollars	7.67	1	7.67	0.17	
Repair & Maintenance	dollars	9.73	1	9.73	0.22	
Labor	dollars	2.76	1	2.76	0.06	
Interest (6 months @ 6.25%) ²	dollars	3.74	1	3.74	0.08	
Total Pre-Harvest Expenses				\$123.53	\$2.75	\$0.00
HARVEST COSTS						
Fuel	dollars	4.76	1	4.76	0.11	
Repair & Maintenance	dollars	3.43	1	3.43	0.08	
Labor	dollars	1.87	1	1.87	0.04	
Hauling ¹	dollars	9.00	1	9.00	0.20	
Total Harvest Costs				\$19.06	\$0.42	\$0.00
Total Operating Costs				\$142.59	\$3.17	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.22	
Machinery Ownership Costs	dollars	47.90	1	47.90	1.06	
Real Estate Taxes	dollars	2.41	1	2.41	0.05	
Total Property & Ownership Costs				\$60.41	\$1.34	\$0.00
TOTAL DIRECT COSTS				\$208.00	\$4.51	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				(\$0.95)	(\$0.02)	\$0.00
FACTOR PAYMENTS						
Land (\$1,250 @ 4%) ³				10.00	0.22	
RETURN TO MANAGEMENT & RISK				(\$10.95)	(\$0.24)	\$0.00

1 Hauling Machinery & Labor Charges= \$0.20/Bushel

2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

3 Includes allocation of fallow acres in the rotation

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)

ALTERNATIVE YIELDS		ALTERNATIVE PRICES (\$/bushel)				
		-25%	-10%	10%	25%	
		\$3.37	\$4.04	\$4.49	\$4.94	\$5.61
-25%	33.75	(\$89.35)	(\$66.62)	(\$51.47)	(\$36.31)	(\$13.58)
-10%	40.50	(\$66.62)	(\$39.34)	(\$21.16)	(\$2.97)	\$24.30
	BUSHEL PER ACRE					
	45.00	(\$51.47)	(\$21.16)	(\$0.95)	\$19.25	\$49.56
	10%	49.50	(\$36.31)	(\$2.97)	\$19.25	\$41.48
	25%	56.25	(\$13.58)	\$24.30	\$49.56	\$74.82
				\$49.56	\$74.82	\$112.70

Table 10. Northeastern Colorado - Dryland Winter Wheat Reduced-Till in Two-Crop in Three

Year Rotation - Estimated Production Costs & Returns

2018

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER BU	
Hard Red Winter Wheat	bu	\$4.49	45	\$202.05	\$4.49	Your Farm
Your Farm	bu			\$0.00	\$0.00	\$0.00
Farm Bill payments were not included due to great variability between counties covered by this budget						
Gross Receipts				\$202.05		\$0
DIRECT COSTS						
	UNIT	COST PER			YOUR	
		UNIT	QUANTITY	PER ACRE	PER BU	FARM
OPERATING PREHARVEST						
Seed						
Seed	dollars	8.54	1.00	8.54	0.19	
Crop Protection						
Fertilizer	dollars	26.49	1	26.49	0.59	
Herbicide	dollars	32.31	1	32.31	0.72	
Custom Application	dollars	7.00	1	7.00	0.16	
Crop Insurance	dollars	32.32	1	32.32	0.72	
Fuel	dollars	7.06	1	7.06	0.16	
Repair & Maintenance	dollars	7.31	1	7.31	0.16	
Labor	dollars	2.60	1	2.60	0.06	
Interest (6 months @ 6.25%) ²	dollars	3.86	1	3.86	0.09	
Total Pre-Harvest Expenses				\$127.49	\$2.83	\$0.00
HARVEST COSTS						
Fuel	dollars	4.36	1	4.36	0.10	
Repair & Maintenance	dollars	3.43	1	3.43	0.08	
Labor	dollars	1.87	1	1.87	0.04	
Hauling ¹	dollars	9.00	1	9.00	0.20	
Total Harvest Costs				\$18.66	\$0.41	\$0.00
Total Operating Costs				\$146.15	\$3.25	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.22	
Machinery Ownership Costs	dollars	36.99	1	36.99	0.82	
Real Estate Taxes	dollars	2.41	1	2.41	0.05	
Total Property & Ownership Costs				\$49.50	\$1.10	\$0.00
TOTAL DIRECT COSTS				\$195.65	\$4.35	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$6.40	\$0.14	\$0.00
FACTOR PAYMENTS						
Land (\$1.250 @ 4%) ³				10.00	0.22	
RETURN TO MANAGEMENT & RISK				(\$3.60)	(\$0.08)	\$0.00

1 Hauling Machinery & Labor Charges= \$0.20/Bushel

2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

3 Includes allocation of fallow acres in the rotation

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)						
		ALTERNATIVE PRICES (\$/bushel)				
		-25%	-10%	\$4.49	10%	25%
ALTERNATIVE YIELDS		\$3.37	\$4.04	\$4.49	\$4.94	\$5.61
-25%	33.75	(\$82.00)	(\$59.27)	(\$44.12)	(\$28.96)	(\$6.23)
-10%	40.50	(\$59.27)	(\$31.99)	(\$13.81)	\$4.38	\$31.65
BUSHELS PER ACRE	45.00	(\$44.12)	(\$13.81)	\$6.40	\$26.60	\$56.91
10%	49.50	(\$28.96)	\$4.38	\$26.60	\$48.83	\$82.17
25%	56.25	(\$6.23)	\$31.65	\$56.91	\$82.17	\$120.05

Table 11. Northeastern Colorado - Dryland Corn Reduced-Till in Two-Crop in Three-Year Rotation
Estimated Production Costs & Returns **2018**

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER BU	
Corn	bu	\$3.52	79	\$278.08	\$3.52	Your Farm
Your Farm	bu			\$0.00	\$0.00	\$0.00
Farm Bill payments were not included due to great variability between counties covered by this budget						
Gross Receipts				\$278.08		\$0
DIRECT COSTS						
	UNIT	COST PER			YOUR	
		UNIT	QUANTITY	PER ACRE	PER BU	FARM
OPERATING PREHARVEST						
Seed						
Seed	dollars	55.14	1.00	55.14	0.70	
Crop Protection						
Fertilizer	dollars	39.95	1	39.95	0.51	
Herbicide	dollars	36.72	1	36.72	0.46	
Custom Application	dollars	7.00	1	7.00	0.09	
Crop Insurance	dollars	25.25	1	25.25	0.32	
Fuel	dollars	3.27	1	3.27	0.04	
Repairs & Maintenance	dollars	2.95	1	2.95	0.04	
Labor	dollars	2.21	1	2.05	0.03	
Interest (6 months @ 6.25%) ²	dollars	6.17	1	6.17	0.08	
Total Pre-Harvest Expenses				\$178.50	\$2.26	\$0.00
HARVEST COSTS						
Fuel	dollars	4.22	1	4.22	0.05	
Repair & Maintenance	dollars	5.50	1	5.50	0.07	
Labor	dollars	1.63	1	1.63	0.02	
Hauling ¹	bu	15.80	1	15.80	0.20	
Total Harvest Costs				\$27.15	\$0.34	\$0.00
Total Operating Costs				\$205.65	\$2.60	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.13	
Machinery Ownership Costs	dollars	33.08	1	33.08	0.42	
Real Estate Taxes	dollars	2.48	1	2.48	0.03	
Total Property & Ownership Costs				\$45.66	\$0.58	\$0.00
TOTAL DIRECT COSTS				\$251.31	\$3.18	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$26.77	\$0.34	\$0.00
FACTOR PAYMENTS						
Land (\$1,250 @ 4%) ³				10.00	0.13	
RETURN TO MANAGEMENT & RISK				\$16.77	\$0.21	\$0.00

1 Hauling Machinery & Labor Charges= \$0.20/Bushel

2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

3 Includes allocation of fallow acres in the rotation

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)						
		ALTERNATIVE PRICES (\$/bushel)				
		-25%	-10%	10%	25%	
ALTERNATIVE YIELDS		\$2.64	\$3.17	\$3.52	\$3.87	\$4.40
-25%	59.25	(\$94.89)	(\$63.61)	(\$42.75)	(\$21.89)	\$9.39
-10%	71.10	(\$63.61)	(\$26.07)	(\$1.04)	\$23.99	\$61.53
BUSHEL PER ACRE	79.00	(\$42.75)	(\$1.04)	\$26.77	\$54.58	\$96.29
10%	86.90	(\$21.89)	\$23.99	\$54.58	\$85.17	\$131.05
25%	98.75	\$9.39	\$61.53	\$96.29	\$131.05	\$183.19

Table 12. Northeastern Colorado - Dryland Oil Sunflowers Reduced-Till in Two-Crop in

Three-Year Rotation - Estimated Production Costs & Returns **2018**

GROSS RECEIPTS FROM PRODUCTION					
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER CWT
Sunflowers	cwt	\$16.69	22	\$367.18	\$16.69
Your Farm	cwt			\$0.00	\$0.00

Farm Bill payments were not included due to great variability between counties covered by this budget

Gross Receipts		\$367.18		\$0
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DIRECT COSTS

	UNIT	COST PER			YOUR FARM
		UNIT QUANTITY	PER ACRE	PER CWT	
OPERATING PREHARVEST					
Seed					
Seed	dollars	24.79	1.00	24.79	1.13
Crop Protection					
Fertilizer	dollars	26.69	1	26.69	1.21
Herbicide	dollars	42.07	1	42.07	1.91
Custom Application	dollars	7.00	2	7.00	0.32
Insecticide	dollars	10.36	1	10.36	0.47
Crop Insurance	dollars	42.42	1	42.42	1.99
Custom Aerial Application	dollars	7.50	1	7.50	0.34
Fuel	dollars	2.04	1	2.19	0.10
Repair & Maintenance	dollars	2.18	1	2.18	0.10
Labor	dollars	1.46	1	1.46	0.07
Interest (6 months @ 6.25%) ²	dollars	5.20	1	5.21	0.24
Total Pre-Harvest Expenses				\$171.87	\$7.81
HARVEST COSTS					
Fuel	dollars	4.57	1	5.35	0.24
Repair & Maintenance	dollars	5.26	1	5.14	0.23
Labor	dollars	1.77	1	1.77	0.08
Hauling ¹	dollars	5.50	1	5.50	0.25
Total Harvest Costs				\$17.76	\$0.81
Total Operating Costs				\$189.63	\$8.62
PROPERTY & OWNERSHIP COSTS					
General Farm Overhead	dollars	10.10	1	10.10	0.46
Machinery Ownership Costs	dollars	23.17	1	23.17	1.05
Real Estate Taxes	dollars	2.76	1	2.76	0.13
Total Property & Ownership Costs				\$36.03	\$1.64
TOTAL DIRECT COSTS				\$225.66	\$10.26
NET RECEIPTS BEFORE FACTOR PAYMENTS				\$141.52	\$6.49
FACTOR PAYMENTS					
Land (\$1,250 @ 4%) ³				10.00	0.45
RETURN TO MANAGEMENT & RISK				\$131.52	\$5.98

1 Hauling Machinery & Labor Charges= \$0.25/Cwt

2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%

3 Includes allocation of fallow acres in the rotation

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)

ALTERNATIVE YIELDS		ALTERNATIVE PRICES (\$/cwt)				
		-25%	-10%	10%	25%	
		\$12.52	\$15.02	\$16.69	\$18.36	\$20.86
-25%	16.50	(\$19.12)	\$22.19	\$49.73	\$77.27	\$118.57
-10%	19.80	\$22.19	\$71.76	\$104.80	\$137.85	\$187.42
CWT	22.00	\$49.73	\$104.80	\$141.52	\$178.24	\$233.32
10%	24.20	\$77.27	\$137.85	\$178.24	\$218.63	\$279.21
25%	27.50	\$118.57	\$187.42	\$233.32	\$279.21	\$348.06

Table 13. Northeastern Colorado - Dryland Proso Millet Reduced-Till in a Two-Crop in Three-Year Rotation - Estimated Production Costs & Returns

2018

GROSS RECEIPTS FROM PRODUCTION						
GROSS RECEIPTS	UNIT	PRICE	YIELD	PER ACRE	PER CWT	
Proso Millet	cwt	\$6.64	14	\$92.96	\$6.64	Your Farm
Your Farm	cwt			\$0.00	\$0.00	\$0.00
Gross Receipts				\$92.96		\$0
DIRECT COSTS						
	UNIT	COST PER		PER ACRE	PER CWT	YOUR FARM
		UNIT QUANTITY				
OPERATING PREHARVEST						
Seed						
Seed	dollars	3.69	1.00	3.69	0.26	
Crop Protection						
Fertilizer	dollars	15.52	1	15.52	1.11	
Herbicide	dollars	12.12	1	12.12	0.87	
Custom Application	dollars	7.00	1	7.00	0.50	
Crop Insurance	dollars	11.11	1	11.11	0.79	
Fuel	dollars	5.18	1	5.18	0.37	
Repairs & Maintenance	dollars	5.17	1	5.17	0.37	
Labor	dollars	2.80	1	2.80	0.20	
Interest (6 months @ 6.25%) ²	dollars	1.96	1	1.96	0.14	
Total Pre-Harvest Expenses				\$64.55	\$4.61	\$0.00
HARVEST COSTS						
Fuel	dollars	8.67	1	8.67	0.62	
Repair & Maintenance	dollars	8.3	1	8.30	0.59	
Labor	dollars	4.63	1	4.63	0.33	
Hauling ¹	bu	5.60	1	5.60	0.40	
Total Harvest Costs				\$27.20	\$1.94	\$0.00
Total Operating Costs				\$91.75	\$6.55	\$0.00
PROPERTY & OWNERSHIP COSTS						
General Farm Overhead	dollars	10.10	1	10.10	0.72	
Machinery Ownership Costs	dollars	44.97	1	44.97	3.21	
Real Estate Taxes	dollars	2.41	1	2.41	0.17	
Total Property & Ownership Costs				\$57.48	\$4.11	\$0.00
TOTAL DIRECT COSTS				\$149.23	\$10.66	\$0.00
NET RECEIPTS BEFORE FACTOR PAYMENTS				(\$56.27)	(\$4.02)	\$0.00
FACTOR PAYMENTS						
Land (\$1.250 @ 4%) ³				10.00	0.71	
RETURN TO MANAGEMENT & RISK				(\$66.27)	(\$4.73)	\$0.00

1 Hauling Machinery & Labor Charges= \$0.40/CWT
 2 Interest on Operating Capital is calculated on 1/2 of pre-harvest operating costs at 6.25%
 3 Includes allocation of fallow acres in the rotation

BREAKEVEN ANALYSIS - PER ACRE RETURNS OVER TOTAL DIRECT COSTS (\$/ACRE)						
ALTERNATIVE YIELDS		ALTERNATIVE PRICES (\$/cwt)				
		-25%	-10%	\$6.64	10%	25%
		\$4.98	\$5.98	\$6.64	\$7.30	\$8.30
-25%	10.50	(\$96.94)	(\$86.48)	(\$79.51)	(\$72.53)	(\$62.08)
-10%	12.60	(\$86.48)	(\$73.93)	(\$65.56)	(\$57.20)	(\$44.65)
CWT	14.00	(\$79.51)	(\$65.56)	(\$56.27)	(\$46.97)	(\$33.03)
10%	15.40	(\$72.53)	(\$57.20)	(\$46.97)	(\$36.74)	(\$21.41)
25%	17.50	(\$62.08)	(\$44.65)	(\$33.03)	(\$21.41)	(\$3.98)

LIVESTOCK ENTERPRISE BUDGET PRINCIPLES

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Introduction | An enterprise is defined as a single crop or livestock commodity being produced. Most farms or ranches consist of a combination of several enterprises. An enterprise budget is a listing of all estimated income and expenses associated with a specific enterprise to help evaluate its profitability. An enterprise budget can be developed for each current or future enterprise in a farm plan. Each is developed on the basis of a common unit such as one acre or one head of livestock. This permits comparison of the profit for alternative and competing enterprises.

Developing an Enterprise Budget | Enterprise budgets can be organized and presented in several different formats, however, they typically contain three sections: 1) Income, 2) Variable or operating costs and 3) Fixed costs. The following are four basic steps in developing an enterprise budget.

- ◆ The first step is to estimate variable costs. In the case of livestock such expenses would include feed, veterinary, repairs, fuel, labor, etc.
- ◆ The second step is to develop an assessment of fixed costs. Fixed costs include, but are not limited to, machinery, breeding stock replacement and land debt payments, lease payments and overhead charges like insurance, taxes and interest.
- ◆ The third step in the process is to estimate the total production and realistic expected commodity price.
- ◆ The last step is to determine net returns (profits) for the given enterprise. Net returns represent that income which is left for the farm or ranch manager and his family to live on, pay debts,

invest or save.

The primary weakness of the budget is that it presents income and cost data for only one situation. The use of computerized budgets will allow you to ask many “what if” questions, thus allowing greater flexibility of the enterprise budget as a management decision tool. Finally, the enterprise budget ignores the impact of one enterprise on other enterprises. For example, a dairy enterprise may compete for a limited labor supply, particularly when it causes delays in planting or harvesting of grain crops.

Livestock Enterprise Budgets | Livestock budgets follow the same general format as crop budgets but are often more difficult to complete because there is a problem of accounting for multiple outputs such as calves, culls cows and cull bulls for a beef cow enterprise or lambs, wool, cull ewes and cull rams for a sheep enterprise. A second problem is proper accounting for the cost of raising or purchasing replacement animals to maintain a breeding herd. Thirdly is the problem of determining a proper charge for farm raised feed, pasture or crop residues used in the livestock enterprise.

Break-Even Factors for the Cow/Calf Operator | While the producer has little or no control over market prices, he does have at least some control over the price needed to break even. Three important factors of break-even prices for the cow/calf producer are: 1) Annual cow costs, 2) Percent calf crop and 3) Weaning weights. Break-even selling prices for weaned calves are presented in Table 1. Factors affecting annual cow costs are expenses for feed, pasture or range leases, vet and medicine, marketing, utilities, labor, fuel, machinery and facility repairs, interest, depreciation, property taxes, etc.

Percent of calf crop is the number of calves weaned per 100 cows exposed the previous breeding season. The two major factors affecting this are: 1) Failure to conceive at breeding and 2) Death loss at or near birth. Calving difficulties play an important role in both areas through actual losses at birth and by delaying the subsequent rebreeding. Weaning weight is significantly influenced by the age of the calf at weaning. Calves born in the first three weeks of calving season average 70 pounds heavier than those born in the last three weeks. Once a cow starts calving late, she tends to always calve late unless she is left open for a year. Obviously, there are numerous factors affecting percent calf crop and weaning weights. However, three pieces of information, kept on an annual basis for each cow, can provide a basis for evaluating the current status of the herd and suggest areas for improvement. These three pieces of information are: 1) calving date, 2) calving ease, and 3) actual weaning weights.

Summary: Enterprise budgets are a tool Colorado producers can use to assist them in making management decisions involving production, financial re-

quirements and marketing strategies. Although enterprise budgets have been used primarily for production planning, like identifying the most profitable enterprise to produce, they also provide valuable information about dollar needs and the timing of those needs. Marketing decisions must be continually evaluated, and should impact the quantity of various products that a farmer/rancher decides to produce. With increased costs of inputs, including money, producers must concern themselves with financial and marketing management decisions. Enterprise budgets are a tool to help evaluate some of these important management decisions.

Tables 1 through 11 contain enterprise budgets (Cost-Return Budgets) for various classes of livestock. The Cost-Return Budgets have been taken from the Kansas State University AgManager.info web site (www.agmanager.info). Glynn Tonsor and Robin Reid are the authors of the cost-return budgets. Glynn and Robin are located in the Department of Agricultural Economics, K-State Research and Extension, Kansas State University, Manhattan, KS.

Production Efficiency Information

Weaning Percentage	91.0%
Cow Replacement Percentage	16.0%

Revenue	Price	Unit	Qty	Unit	Total per Year per Cow
Weaned Calf Sale	\$ 160.90	per cwt	x 550	lbs	x 0.91 = \$ 805.28
Cull Cows	\$ 45.50	per cwt	x 1250	lbs	x 0.16 = \$ 91.00
Other Income					
Gross Income					\$ 896.28

Variable Costs

Pasture	\$ 19.00	per acre	x 9.5	total acres	= \$ 180.50
Crop Residue	\$ 15.00	per acre	x 2.0	total acres	= \$ 30.00
Harvested Forage	\$ 90.00	per ton	x 2.25	total tons	= \$ 202.50
Grain/Protein Supplements	\$ 170.31	per ton	x 833.0	total lbs	= \$ 70.94
Mineral	\$ 850.00	per ton	x 100.0	total lbs	= \$ 42.50
Other Feed	\$ -	per unit	x 0.0	units	= \$ -
Labor	\$ 20.00	per hour	x 8.0	total hours	= \$ 160.00
Vet Medicine/Drugs					\$ 35.00
Replacement Females	\$ 840.35	per head	x 0.16	hd	= \$ 134.46
Annual Bull Charge or A.I.					\$ 43.00
Other Livestock Breeding/Marketing					\$ 23.50
Utilities					\$ 15.00
Gas, Fuel, Oil					\$ 22.00
Machinery, Facility/Equip. Repairs					\$ 45.00
Cash Interest Paid					\$ 32.00
Other variable costs					\$ 15.00
Total Variable Costs					\$ 1,051.39

Fixed Costs

Depreciation	\$ 54.00
Taxes	\$ 12.00
Farm/Livestock Insurance	\$ 15.00
Opportunity Cost of Investment	\$ 135.00
Other fixed costs	\$ -
Total Fixed Costs	\$ 216.00

Total Costs

Total Costs	\$ 1,267.39
Income Over Variable Costs	\$ (155.12)
Income Over Total Costs	\$ (371.12)

Production Efficiency Information

Death Loss	2.0%				CWT Produced
Days In Backgrounding Lot	150.0	Average Daily Gain	1.25		1.875

	Gross Return	Price	Unit	Qty	Unit		Total per Year
Feeder Animal Sale	\$	147.98	per cwt	x	738	lbs	= \$ 1,091.37
Purchase price	\$	169.00	per cwt	x	550	lbs	= \$ (929.50)
Death Loss							\$ (18.59)
Other							
Total Gross Return							\$ 149.28

Variable Costs							
Pasture	\$	19.00	per acre	x	0.0	total acres	= \$ -
Crop Residue	\$	15.00	per acre	x	0.0	total acres	= \$ -
Harvested Forage	\$	135.00	per ton	x	0.53	total tons	= \$ 70.88
Grain/Protein Supplements	\$	154.46	per ton	x	2100	total lbs	= \$ 162.19
Mineral	\$	600.00	per ton	x	45.0	total lbs	= \$ 13.50
Other Feed	\$	-	per unit	x	0.0	units	= \$ -
Labor	\$	20.00	per hour	x	1.5	hours	= \$ 30.00
Vet Medicine/Drugs							\$ 13.00
Marketing costs							\$ 9.00
Utilities, Gas, Fuel, Oil							\$ 4.00
Machinery, Facility/Equip. Repairs							\$ 7.00
Cash Interest Paid							\$ 9.00
Other variable costs							\$ 2.00
Total Variable Costs							\$ 320.56

Fixed Costs							
Depreciation							\$ 6.00
Taxes							\$ 1.00
Farm/Livestock Insurance							\$ 1.50
Opportunity Cost of Investment							\$ 22.00
Other fixed costs							\$ -
Total Fixed Costs							\$ 30.50

Total Costs							\$ 351.06
Income Over Variable Costs							\$ (177.28)
Income Over Total Costs							\$ (207.78)

KSU Beef Stocker Budget

2019 Production Year (as of Dec. 17th, 2018)

Production Efficiency Information

Death Loss	1.0%		CWT Produced
Days on Grass	120.0	Average Daily Gain	1.25
			1.500

Gross Return	Price	Unit	Qty	Unit	=	Total per Year
Feeder Sale	\$ 153.47	<i>per cwt</i>	x 888	<i>lbs</i>	=	\$ 1,362.06
Purchase price	\$ 151.99	<i>per cwt</i>	x 738	<i>lbs</i>	=	\$ (1,120.94)
Death Loss						\$ (11.21)
Other						
Total Gross Return						\$ 229.91

Variable Costs

Pasture	\$ 19.00	<i>per acre</i>	x 2.5	<i>total acres</i>	=	\$ 47.50
Crop Residue	\$ 15.00	<i>per acre</i>	x 0.0	<i>total acres</i>	=	\$ -
Harvested Forage	\$ -	<i>per ton</i>	x 0	<i>total tons</i>	=	\$ -
Grain/Protein Supplements	\$ -	<i>per ton</i>	x 0	<i>total lbs</i>	=	\$ -
Mineral	\$ 600.00	<i>per ton</i>	x 12.0	<i>total lbs</i>	=	\$ 3.60
Other Feed	\$ -	<i>per unit</i>	x 0.0	<i>units</i>	=	\$ -
Labor	\$ 20.00	<i>per hour</i>	x 0.8	<i>hours</i>	=	\$ 16.00
Vet Medicine/Drugs						\$ 6.00
Marketing costs						\$ 9.00
Utilities, Gas, Fuel, Oil						\$ 5.00
Machinery, Facility/Equip. Repairs						\$ 7.00
Cash Interest Paid						\$ 6.00
Other variable costs						\$ 2.00
Total Variable Costs						\$ 102.10

Fixed Costs

Depreciation						\$ 5.00
Taxes						\$ 1.00
Farm/Livestock Insurance						\$ 1.00
Opportunity Cost of Investment						\$ 15.00
Other fixed costs						\$ -
Total Fixed Costs						\$ 22.00

Total Costs

Total Costs	\$ 124.10
Income Over Variable Costs	\$ 127.81
Income Over Total Costs	\$ 105.81

Kansas State University, Department of Agricultural Economics - www.agmanager.info

Publication: AM-FMG-Stocker

Version- 12.17.2018

KSU Beef Stocker Budget

K-State's Agricultural Economics Department annually publishes *Farm Management Guides* to

Gross Return

Feeder Animal Sale: Default is based upon Steer price in

KSU Beef Finishing Budget 2019 Production Year (as of Dec. 17th, 2018)

Production Efficiency Information

Death Loss	1.5%			CWT Produced	5.550
Days on Feed	150.0	Average Daily Gain	3.7		

	Gross Return	Price	Unit	Qty	Unit	Total per Year
Fed Animal Sale	\$	102.11	per cwt	x 1443	lbs	= \$ 1,472.92
Purchase price	\$	153.47	per cwt	x 888	lbs	= \$ (1,362.06)
Death Loss						\$ (20.43)
Other						
Total Gross Return						\$ 90.42

Variable Costs

Harvested Forage	\$	135.00	per ton	x 0.23	total tons	= \$ 30.38
Grain/Protein Supplements	\$	143.26	per ton	x 3300.0	total lbs	= \$ 236.38
Mineral	\$	600.00	per ton	x 75.0	total lbs	= \$ 22.50
Other Feed	\$	-	per unit	x 0.0	units	= \$ -
Labor	\$	20.00	per hour	x 1.5	hours	= \$ 30.00
Vet Medicine/Drugs						\$ 20.00
Marketing costs						\$ 10.00
Utilities,Gas, Fuel, Oil						\$ 9.00
Machinery, Facility/Equip. Repairs						\$ 10.00
Cash Interest Paid						\$ 17.00
Other variable costs						\$ 8.00
Total Variable Costs						\$ 393.26

Fixed Costs

Depreciation	\$	15.00				\$ 15.00
Taxes	\$	2.00				\$ 2.00
Farm/Livestock Insurance	\$	3.50				\$ 3.50
Opportunity Cost of Investment	\$	36.00				\$ 36.00
Other fixed costs	\$	-				\$ -
Total Fixed Costs						\$ 56.50

Total Costs

Total Costs						\$ 449.76
Income Over Variable Costs						\$ (302.84)
Income Over Total Costs						\$ (359.34)

Kansas State University, Department of Agricultural Economics - www.agmanager.info

Publication: AM-FMG-Finishing

Version- 12.17.2018

KSU Beef Finishing Budget

K-State's Agricultural Economics Department annually publishes *Farm Management Guides* to estimate the current profitability of different

Gross Return

Fed Animal Sale: Default is based upon a December Steer price, adjust if feeding heifers.

KSU Dairy Cow Budget-Purchased Replacements

Current Prices (as of Dec. 17th, 2018)

Production Efficiency Information

Milk Produced Per Cow (lbs)	23,500				
Replacement Heifer Purchases	37.0%	Cull Cows Sales	30.0%	Calves Sold	92%

Returns	Price	Unit		Qty	Unit		Total per Cow/Year	Total per CWT Milk/Year
Milk Sales	\$ 16.60	per cwt	x	23500	lbs	=	\$ 3,901.00	\$ 16.60
Milk Premiums	\$ -	per cwt	x	23500	lbs	=	\$ -	\$ -
Calves Sold	\$ 68.75	per head	x	0.92	hd	=	\$ 63.25	\$ 0.27
Cull Cows Sold	\$ 37.50	per cwt	x	1350	lbs	x 0.30 =	\$ 151.88	\$ 0.65
Manure Credit							\$ 120.00	\$ 0.51
Other Income							\$ 80.00	\$ 0.34
Total Gross Return							\$ 4,316.13	\$ 18.37

Variable Costs

Feed Cost	\$ 5.98	per head/day	x	365	days	=	\$ 2,181.68	\$ 9.28
Replacement Helpers	\$ 875.00	per head	x	0.37	hd	=	\$ 323.75	\$ 1.38
Cow Breeding Fees							\$ 44.50	\$ 0.19
Daily Labor	\$ 15.00	per hour	x	35.0	hours	=	\$ 525.00	\$ 2.23
Management Labor	\$ 25.00	per hour	x	8.0	hours	=	\$ 200.00	\$ 0.85
Milk Marketing & Hauling							\$ 105.00	\$ 0.45
Veterinary							\$ 130.00	\$ 0.55
Fuel & Oil							\$ 70.00	\$ 0.30
Utilities							\$ 65.00	\$ 0.28
Machinery, Facility/Equip. Repairs							\$ 137.00	\$ 0.58
Bedding							\$ 85.00	\$ 0.36
Custom Hire							\$ 75.00	\$ 0.32
Cash Interest Paid							\$ 95.00	\$ 0.40
Other variable costs							\$ 280.00	\$ 1.19
Total Variable Costs							\$ 4,316.93	\$ 18.37

Fixed Costs

Depreciation							\$ 185.00	\$ 0.79
Farm/Livestock Insurance							\$ 54.00	\$ 0.23
Opportunity Cost of Investment							\$ 260.00	\$ 1.11
Other fixed costs							\$ 115.00	\$ 0.49
Total Fixed Costs							\$ 614.00	\$ 2.61

Total Costs

							\$ 4,930.93	\$ 20.98
Income Over Variable Costs							\$ (0.81)	\$ (0.00)
Income Over Total Costs							\$ (614.81)	\$ (2.62)

Production Efficiency Information

Milk Produced Per Cow (lbs)	23,500	Cull Cows Sales	30.0%	Calves Sold at Birth	46%
Cull Replacements Sold	5.0%	Cull Yearlings Sold	2.0%	Repl. Heifer Death Loss	7.0%
Replacement Heifer Turnover	36.0%				

Returns	Price	Unit	Qty	Unit	Total per Cow/Year	Total per CWT Milk/Year
Milk Sales	\$ 16.60	per cwt	x 23500	lbs	= \$ 3,901.00	\$ 16.60
Milk Premiums	\$ -	per cwt	x 23500	lbs	= \$ -	\$ -
Calves Sold	\$ 67.50	per head	x 0.46	hd	= \$ 31.05	\$ 0.13
Cull Cows Sold	\$ 37.50	per cwt	x 1350	lbs	x 0.30 = \$ 151.88	\$ 0.65
Cull Replacements Sold	\$ 107.00	per cwt	x 1250	lbs	x 0.05 = \$ 66.88	\$ 0.28
Cull Yearlings Sold	\$ 145.00	per cwt	x 725	lbs	x 0.02 = \$ 21.03	\$ 0.09
Manure Credit					\$ 192.60	\$ 0.56
Other Income					\$ 86.00	\$ 0.37
Total Gross Return					\$ 4,390.43	\$ 18.68

Variable Costs

Heifer Feed Cost	\$ 840.00	total cost			x 0.43	\$ 361.20	\$ 1.54
Cow Feed Cost	\$ 5.98	per head/day	x 365	days		\$ 2,181.88	\$ 9.28
Breeding Fees						\$ 62.00	\$ 0.26
Daily Labor	\$ 15.00	per hour	x 42.0	hours	=	\$ 630.00	\$ 2.68
Management Labor	\$ 25.00	per hour	x 9.5	hours	=	\$ 237.50	\$ 1.01
Milk Marketing & Hauling						\$ 105.00	\$ 0.45
Veterinary						\$ 160.00	\$ 0.68
Fuel & Oil						\$ 85.00	\$ 0.36
Utilities						\$ 83.00	\$ 0.35
Machinery, Facility/Equip. Repairs						\$ 160.00	\$ 0.68
Bedding						\$ 120.00	\$ 0.51
Custom Hire						\$ 77.00	\$ 0.33
Cash Interest Paid						\$ 102.00	\$ 0.43
Other variable costs						\$ 303.00	\$ 1.29
Total Variable Costs						\$ 4,667.38	\$ 19.86

Fixed Costs

Depreciation						\$ 192.00	\$ 0.82
Farm/Livestock Insurance						\$ 65.00	\$ 0.28
Opportunity Cost of Investment						\$ 268.00	\$ 1.14
Other fixed costs						\$ 134.00	\$ 0.57
Total Fixed Costs						\$ 659.00	\$ 2.80

Total Costs

						\$ 5,326.38	\$ 22.67
Income Over Variable Costs						\$ (276.96)	\$ (1.18)
Income Over Total Costs						\$ (995.96)	\$ (3.98)

Production Efficiency Information

Cull Replacements Sold	5.0%	Death Loss	7.0%
Cull Yearlings Sold	2.0%		

Returns	Price	Unit		Qty	Unit	%		Total per Heifer
Springer Heifer Sales	\$ 875.00	per head	x			0.86	=	\$ 752.50
Cull Replacements Sold	\$ 107.00	per cwt	x	1250	lbs	0.05	=	\$ 66.88
Cull Yearlings Sold	\$ 145.00	per cwt	x	725	lbs	0.02	=	\$ 21.03
Manure Credit								\$ 35.00
Other Income								
Purchase of Heifer Calf	\$ 70.00	per head						\$ (70.00)
Total Gross Return								\$ 805.40

Variable Costs

Feed Costs								\$ 840.00
Daily Labor	\$ 15.00	per hour	x	15.0	hours			\$ 225.00
Management Labor	\$ 25.00	per hour	x	3.0	hours			\$ 75.00
Breeding Fees								\$ 25.00
Veterinary								\$ 48.00
Fuel & Oil								\$ 26.00
Utilities								\$ 25.50
Machinery, Facility/Equip. Repairs								\$ 49.00
Bedding								\$ 41.00
Custom Hire								\$ 10.00
Cash Interest Paid								\$ 33.00
Other Variable Costs								\$ 44.00
Total Variable Costs								\$ 1,441.50

Fixed Costs

Depreciation								\$ 74.00
Insurance								\$ 18.00
Opportunity Cost of Investment								\$ 84.00
Other fixed costs								\$ 43.00
Total Fixed Costs								\$ 219.00

Total Costs

Total Costs								\$ 1,660.50
Income Over Variable Costs								\$ (636.10)
Income Over Total Costs								\$ (855.10)

Production Efficiency Information

Weaned Pigs/Mated Sow/Year	23.90		
Litters/Mated Sow/Year	2.30		
Wean-Finish Mortality (%)	7.99	Nursery Feed to Gain	1.54
Market Hogs Sold/Mated Sow/Year	21.99	Grow/Finish Feed to Gain	2.54
Sow Replacement Rate	50%	Weaned Pig Weight	14.00
Sow Mortality (%)	8%	Nursery Exit Weight	52.00

Revenue	Price	Unit	Qty	Unit		Total per Year per Sow	Total per Year per Pig Sold
Market Hogs	\$ 36.57	per cwt	x 277	lbs	x 21.99 =	\$ 2,227.60	\$ 101.30
Cull Sows	\$ 41.20	per cwt	x 400	lbs	x 0.42 =	\$ 69.22	\$ 3.15
Manure Credit						\$ 131.94	\$ 6.00
Other revenue						\$ -	\$ -
Gross Income						\$ 2,428.76	\$ 110.45
Variable Costs							
Sow Feed	\$ 0.09	per lb	x 125.0	lbs	=	\$ 26.63	\$ 11.58
Nursery Feed	\$ 0.14	per lb	x 58.5	lbs	=	\$ 199.75	\$ 8.36
Grow-Finish Feed	\$ 0.09	per lb	x 571.5	lbs	=	\$ 1,092.65	\$ 49.69
Feed Processing	\$ 17.00	per ton	x 0.4	ton	=	\$ 141.13	\$ 6.42
Labor	\$ 15.00	per hour	x 6.0	hours	=	\$ 207.00	\$ 9.41
Vet Medicine/Drugs						\$ 187.00	\$ 8.50
Replacement Females	\$ 175.57	per head	x 0.50	hd	=	\$ 87.78	\$ 3.99
Semen Cost & Genetic Fee						\$ 29.90	\$ 1.36
Marketing, Bedding, and Misc						\$ 62.13	\$ 2.83
Utilities, Gas, Fuel, Oil						\$ 116.95	\$ 5.32
Machinery, Facility/Equip. Repairs						\$ 87.11	\$ 3.96
Other variable costs						\$ -	\$ -
Total Variable Costs						\$ 2,238.03	\$ 111.41
Fixed Costs							
Machinery, Facilities, General Overhead						\$ 907.00	\$ 41.25
Taxes and Insurance						\$ 38.38	\$ 1.75
Legal, Accounting, etc.						\$ 32.99	\$ 1.50
Other fixed costs						\$ -	\$ -
Total Fixed Costs						\$ 978.36	\$ 44.49
Total Costs						\$ 3,216.39	\$ 155.90
Income Over Variable Costs						\$ 190.73	\$ (0.97)
Income Over Total Costs						\$ (787.63)	\$ (45.46)

Production Efficiency Information

Weaned Pigs/Mated Sow/Year	23.90
Litters/Mated Sow/Year	2.30
Weaning Weight (lbs)	14.00
Sow Replacement Rate	50%
Sow Mortality (%)	8%

Revenue	Price	Unit	Qty	Unit		Total per Year per Sow	Total per Year per Pig Sold
Weaned Pig	\$ 62.12	per hd	x 1	hd	=	\$ 1,484.67	\$ 62.12
Cull Sows	\$ 41.20	per cwt	x 400	lbs	x 0.42 =	\$ 69.22	\$ 2.90
Manure Credit						\$ 11.95	\$ 0.50
Other revenue						\$ -	\$ -
Gross Income						\$ 1,565.83	\$ 65.52
Variable Costs							
Sow Feed	\$ 0.09	per lb	x 125.0	lbs	=	\$ 276.69	\$ 11.58
Feed Processing	\$ 17.00	per ton	x 0.1	ton	=	\$ 25.39	\$ 1.06
Labor	\$ 15.00	per hour	x 6.9	hours	=	\$ 103.50	\$ 4.33
Vet Medicine/Drugs						\$ 60.03	\$ 2.51
Replacement Females	\$ 175.57	per head	x 0.50	hd	=	\$ 87.78	\$ 3.67
Semen Cost & Genetic Fee						\$ 29.90	\$ 1.25
Marketing, Bedding, and Misc						\$ 3.42	\$ 0.14
Utilities, Gas, Fuel, Oil						\$ 18.59	\$ 0.78
Machinery, Facility/Equip. Repairs						\$ 11.27	\$ 0.47
Other variable costs						\$ -	\$ -
Total Variable Costs						\$ 616.59	\$ 25.80
Fixed Costs							
Machinery, Facilities, General Overhead						\$ 178.37	\$ 7.46
Taxes and Insurance						\$ 6.08	\$ 0.25
Legal, Accounting, etc.						\$ 11.95	\$ 0.50
Other fixed costs						\$ -	\$ -
Total Fixed Costs						\$ 196.40	\$ 8.22
Total Costs						\$ 812.99	\$ 34.02
Income Over Variable Costs						\$ 949.24	\$ 39.72
Income Over Total Costs						\$ 752.84	\$ 31.50

Production Efficiency Information

Wean-Finish Mortality (%)	7.99
Wean-Finish Feed to Gain	2.54
Placement Weight (lbs)	14.00

Revenue	Price	Unit		Qty	Unit			Total per Year per Pig Sold
Market Hogs	\$ 36.57	per cwt	x	277	lbs	x	0.92	= \$ 93.21
Less cost of Weaned Pigs	\$ 62.12	per hd	x	1	hd			= \$ (62.12)
Manure Credit								\$ 5.50
Other revenue								\$ -
Gross Income								\$ 36.59
Variable Costs								
Nursery Feed	\$ 0.14	per lb	x	57.4	lbs			= \$ 8.19
Grow-Finish Feed	\$ 0.09	per lb	x	610.6	lbs			= \$ 53.09
Feed Processing	\$ 17.00	per ton	x	0.3	ton			= \$ 5.68
Labor	\$ 15.00	per hour	x	0.7	hours			= \$ 10.50
Vet Medicine/Drugs								\$ 6.02
Marketing, Bedding, and Misc								\$ 0.75
Utilities, Gas, Fuel, Oil								\$ 3.84
Machinery, Facility/Equip. Repairs								\$ 2.40
Other variable costs								\$ -
Total Variable Costs								\$ 90.46
Fixed Costs								
Machinery, Facilities, General Overhead								\$ 25.43
Taxes and Insurance								\$ 2.14
Legal, Accounting, etc.								\$ 1.00
Other fixed costs								\$ -
Total Fixed Costs								\$ 28.57
Total Costs								\$ 119.03
Income Over Variable Costs								\$ (53.88)
Income Over Total Costs								\$ (82.45)

KSU Nursery Swine Budget

Current Prices (as of Dec. 17th, 2018)

Production Efficiency Information

Nursery Mortality (%)	4.77
Feed to Gain Conversion	1.54
Entry Weight (lbs)	14.00
Exit Weight (lbs)	52.00

Revenue	Price	Unit		Qty	Unit			Total per Year per Pig Sold
Feeder Pigs	\$ 67.62	per hd	x	52.00	lbs	x	0.95	= \$ 64.39
Less cost of Weaned Pigs	\$ 62.12	per hd	x	1	hd			= \$ (62.12)
Manure Credit								\$ 0.50
Other revenue								\$ -
Gross Income								\$ 2.77
Variable Costs								
Nursery Feed	\$ 0.14	per lb	x	57.3	lbs			= \$ 8.18
Feed Processing	\$ 17.00	per ton	x	0.03	ton			= \$ 0.49
Labor	\$ 15.00	per hour	x	0.2	hours			= \$ 3.00
Vet Medicine/Drugs								\$ 1.76
Marketing, Bedding, and Misc								\$ 0.18
Utilities, Gas, Fuel, Oil								\$ 0.75
Machinery, Facility/Equip. Repairs								\$ 0.49
Other variable costs								\$ -
Total Variable Costs								\$ 14.85
Fixed Costs								
Machinery, Facilities, General Overhead								\$ 5.80
Taxes and Insurance								\$ 0.33
Legal, Accounting, etc.								\$ 0.50
Other fixed costs								\$ -
Total Fixed Costs								\$ 6.63
Total Costs								\$ 21.48
Income Over Variable Costs								\$ (12.08)
Income Over Total Costs								\$ (18.71)

KSU Finishing Swine Budget

Current Prices (as of Dec. 17th, 2018)

Production Efficiency Information

Finisher Mortality (%)	5.19
Feed to Gain Conversion	2.71
Entry Weight (lbs)	52.00
Exit Weight (lbs)	272.80

Revenue	Price	Unit		Qty	Unit			Total per Year per Pig Sold
Market Hogs	\$ 36.57	per cwt	x	273	lbs	x 0.95	=	\$ 94.59
Less cost of Feeder Pigs	\$ 67.62	per hd					=	\$ (67.62)
Manure Credit								\$ 5.00
Other revenue								\$ -
Gross Income								\$ 31.97
Variable Costs								
Grow-Finish Feed	\$ 0.09	per lb	x	598.4	lbs		=	\$ 52.02
Feed Processing	\$ 17.00	per ton	x	0.30	ton		=	\$ 5.09
Labor	\$ 15.00	per hour	x	0.2	hours		=	\$ 3.00
Vet Medicine/Drugs								\$ 4.13
Marketing, Bedding, and Misc								\$ 0.55
Utilities, Gas, Fuel, Oil								\$ 3.11
Machinery, Facility/Equip. Repairs								\$ 1.88
Other variable costs								\$ -
Total Variable Costs								\$ 69.78
Fixed Costs								
Machinery, Facilities, General Overhead								\$ 19.39
Taxes and Insurance								\$ 1.77
Legal, Accounting, etc.								\$ 1.00
Other fixed costs								\$ -
Total Fixed Costs								\$ 22.15
Total Costs								\$ 91.93
Income Over Variable Costs								\$ (37.82)
Income Over Total Costs								\$ (59.97)

Other Livestock Breeding/Marketing	\$	4.00
Shearing	\$	5.00
Utilities, Gas, Fuel, Oil	\$	6.50
Machinery, Facility/Equip. Repairs	\$	6.00
Other Variable Costs	\$	-
Cash Interest Paid	\$	8.50
Total Variable Costs	\$	238.20
Fixed Costs		
Depreciation - Buildings/Equipment	\$	15.00
Depreciation - Livestock	\$	1.00
Taxes/Insurance - Farm & Livestock	\$	5.00
Interest - Buildings/Equipment & Livestock	\$	17.00
Other Fixed Costs	\$	-
Total Fixed Costs	\$	38.00
Total Costs	\$	276.20
Income Over Variable Costs	\$	138.17
Income Over Total Costs	\$	100.17

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Publication: AM-FMG-Once-a-Year Lambing

Version-12.17.2018

KSU Once-a-Year Lambing Budget

K-State's Agricultural Economics Department annually publishes *Farm Management Guides* to estimate the current profitability of different agricultural enterprises. A new format for livestock enterprises this year allows the user to change certain key inputs to cater the budget to their production situation. Climate, genetics, local cash prices, and a variety of other factors makes budgeting to the entire state of Kansas difficult. While defaults in the spreadsheet are estimates for the state, users should enter their own prices and costs using the cells in blue.

Two different sets of price forecasts are available in the spreadsheet. By clicking the dropdown menu at the top of the budget, a user can select "Current Prices" or "One Year Out Prices". All price assumptions can be viewed in the *Prices* tab. This budget assumes slaughter lambs will be sold in September of the budget year.

Feed assumptions can be viewed in the *Feed* tab. The default Once-a-Year Lambing budget assumes a spring lambing that develops their own replacements; therefore costs include 15% of the cost of raising a replacement ewe (default is a 15% replacement percentage) and 2.5% of the cost of maintaining a Ram (assuming 1 Ram per 40 ewes). If purchasing replacements or A.I. breeding, costs should be adjusted accordingly.

Production Efficiency Measures

Weaning Percentage: Lambs weaned per ewe exposed.
Ewe Replacement Percentage: Percent of lambs retained for replacements as well as cull ewes sold.

Variable Costs (continued)

Grain/Protein Supplements: In the *Feed* tab, a yearly ration of grain sorghum and soybean meal gets combined and the price weighted based on the proportions of each.

Salt & Mineral: In the *Feed* tab, total pounds/year is entered.

Other Feed: The amount for other feed that is not represented in the *Feed* tab.

Labor: *Labor Hired + Unpaid Operator Labor* determines a dollar per hour estimate across livestock budgets.

Replacement Ewes: If purchasing replacements, change this to purchase cost and reduce expenses accordingly.

Ram Charge: Default assumes straight-line depreciation on a \$550 Ram with a \$65 salvage value and 5 year useful life. 2.5% is applied per ewe.

Vet Medicine/Drugs: The amount for veterinarian services, drugs, and supplies.

Other Livestock Breeding/Marketing: The amount that includes trucking, sale commissions, and other expenses.

Shearing: The amount for shearing each ewe.

Utilities, Gas, Fuel, Oil: The amount for the lamb enterprises' share.

Machinery, Facility/Equip. Repairs: The amount for the lamb enterprises' share.

Cash Interest Paid: The amount for the lamb enterprises' share.

Other Variable Costs: Rough sum of all other variable costs, includes fees/publications/travel, conservation, building rental, predator control, etc. to the lamb enterprise.

Livestock Terms, Tables, and Figures

Travis Taylor, Area Livestock Agent

Livestock management decisions determine the success of an operation. The following section contains important information and tools to aid livestock producers in their decision-making and management practices.

Livestock Nutrition Terms

Proper livestock nutrition requires an understanding of the composition of animal feeds. This section contains key terms and definitions for understanding feed nutrient analysis results.

DM % - Dry Matter

Moisture levels vary greatly between livestock feeds. The material remaining in a feed after the water is removed is called the DM. The DM content of a feed affects feed intake. The following feed analysis values are on a DM basis.

CP % - Crude Protein

CP is an estimation of the protein content in a feed by measuring the amount of nitrogen. On average, proteins contain 16% nitrogen; therefore, by multiplying the nitrogen content by (6.25 or 100/16) gives an estimation of the protein content.

DIP % - Degradable Intake Protein

DIP is the fraction of the feed crude protein that is degraded in the rumen. It provides a nitrogen source for rumen microbes from both protein and non-protein nitrogen.

UIP % - Undegraded Intake Protein

UIP, also known as “by-pass” protein, is the fraction of the feed crude protein that passes out of the rumen undigested. It contributes to the metabolizable protein value.

MP % - Metabolizable Protein

MP is protein that is available to the animal including microbial crude protein and UIP.

NDF % - Neutral Detergent Fiber

NDF is the percentage of fiber in a feed (cellulose and lignin) including hemicellulose. There is a high correlation between NDF and feed intake.

ADF % - Acid Detergent Fiber

ADF is the percentage of fiber in a feed (cellulose and lignin) not including hemicellulose. There is a high correlation between ADF and digestibility.

TDN % - Total Digestible Nutrients

TDN is the preferred value for expressing the energy content of feeds despite some fundamental flaws with its use. TDN is generally calculated using the ADF value. One of the issues with TDN is it tends to overestimate the livestock performance consuming roughages.

NE – Net Energy

The NE system divides the energy use into three categories based on the production stage of the animal. The three categories are NE for maintenance (**NE_m**), NE for growth (**NE_g**) and NE for lactation (**NE_l**). The efficiency in which animals use the feed energy will change depending on bodily function. For example, energy is used more efficiently to meet maintenance requirements than for muscle/tissue growth. The accuracy of the NE system relies on the ability to predict animal intake.

RFV – Relative Feed Value

RFV is a value used solely for identifying the quality of hay. It is the combination of estimated feed intake and digestibility calculated from NDF and ADF values correspondingly.

RFQ - Relative Forage Quality

RFQ is similar to RFV in that it is used to identify the quality of hay, incorporating feed intake and digestibility. Where RFQ differs from RFV is that a

simulated rumen digestion test is performed, making it more accurate than RFV. Neither RFV nor RFQ are useful in balancing rations for livestock.

Comparing Prices of Livestock Feeds

Feeding livestock makes up the majority of the costs associated with livestock production. The ability to compare and price one feed to another gives livestock producers the ability to choose least cost feeding solutions and save money. This table allows the user to compare the price of feeds on a nutrient or feed analysis basis.

To use the feed price calculator, enter information that you know about the feed in the feed analysis table.

Feed Costs, Pounds per unit, and Dry Matter must be entered to perform calculations. Crude protein, TDN, and Net Energy values are optional, but are valuable in balancing rations for livestock. For descriptions of these values, see the terms and definitions on the previous page.

Next, use the Feed Price Comparison table to calculate prices per nutrient/analysis value. Use the numbers in the calculations column to complete the Feed Price Comparison Table 1. The price of the feeds in the Feed Price Comparison section can then be compared horizontally between feed #1 and #2.

Table 1. Comparing Prices of Livestock Feeds

Feed Analysis Information	Feed #1	Feed #2	Example	Calculation #	
<i>Feed Name</i>			Ex. Alfalfa	1	
<i>Feed Cost per unit (\$)</i>			240	2	
<i>Pounds per unit (pounds, ex: 2000 lbs)</i>			2000	3	
<i>Dry Matter (%)</i>			91	4	<i>*Use decimal form of percent's in calculations</i>
<i>Crude Protein (%)</i>			20	5	
<i>TDN (%)</i>			58	6	
<i>Net Energy for maintenance (Mcal/lb)</i>			0.56	7	
<i>Net Energy for gain (Mcal/lb)</i>			0.31	8	
					<i>Ex: 91%/100 = .91</i>

Feed Price Comparison	Feed #1	Feed #2	Example	Calculations	
<i>Price per pound of DM (\$/lb)</i>			0.132	2/(3*4)	<i>*Use calculation #'s from above to perform the calculations.</i>
<i>Price per pound of CP (\$/lb)</i>			0.659	2/(3*4*5)	
<i>Price per pound of TDN (\$/lb)</i>			0.227	2/(3*4*6)	
<i>Price per pound of NEm (\$/lb)</i>			0.235	2/(3*4*7)	
<i>Price per pound of NEg (\$/lb)</i>			0.425	2/(3*4*8)	

**Use the "Calculations" column on the right to find feed prices for specific nutrients.*

Animal Unit Equivalents for Grazing

Grazing management is crucial for rangeland health in the Golden Plains Area. Using a stocking rate too high can lead to overgrazing and damage the ecology of the rangeland. Effective grazing strategies identify forage availability and the animal units the pasture can support. The following table allows livestock producers,

who know their pasture’s forage availability and the appropriate stocking rate, to determine the appropriate number of grazing animals by species. Animal intake may fluctuate between animals and on a day-to-day basis. The data in Table 2 are averages, and the assumption is that 1 animal unit (AU) will consume 26 pounds per day of air dried forage.

Table 2. Animal Unit Equivalents for Various Livestock and Wildlife Species

Animal Class	AU Equivalent
Cattle	
Cow (1,000 lb non- lactating)	1
Pregnant heifer (≥ 18 months)	1
Bull (> 24 months)	1.5
Bull (< 24 months)	1.2
Cow and calf	1.3
Yearling (> 18 months)	0.9
Yearling (< 18 months)	0.8
Calf (< 12 months)	0.6
Sheep and goat	
Non-lactating ewe or doe	0.2
Ewe or doe with young	0.3
Weaned lamb or kid	0.15
Horse	
Draft	1.5
Saddle	1.25
Others	
Deer (red)	0.34
Deer (fallow)	0.17
Bison (mature)	1
Elk (mature)	0.65
<i>An animal unit is considered to be equal to a mature 1,000 lb cow that is not lactating and is being fed at a maintenance level diet with an intake of 26 pounds per day.</i>	

Estimated Livestock Water Requirements

Livestock use water for temperature regulation, digestion, growth, and many other bodily functions, making it very important for producers to know how much their livestock will drink. The ambient temperature,

water temperature, diet, growth, lactation and the animal's activity all play a part in how much the animal will drink. Table 3 contains average water consumption for various livestock species at various temperatures. Actual water consumption may vary.

Table 3. Estimated livestock water requirements (gallons per head per day)						
	Temperature in ° F					
Weight in lbs	40	50	60	70	80	90
Growing Beef Calves^a						
400	4.0	4.3	5.0	5.8	6.7	9.5
600	5.3	5.8	6.6	7.8	8.9	12.7
800	6.3	6.8	7.9	9.2	10.6	15.0
Finishing Beef Cattle^a						
600	6.0	6.5	7.4	8.7	10.0	14.3
800	7.3	7.9	9.1	10.7	12.3	17.4
1,000	8.7	9.4	10.8	12.6	14.5	20.6
Wintering Pregnant Beef Cows^a						
900	6.7	7.2	8.3	9.7	---	---
1,110	6.0	6.5	7.4	8.7	---	---
Lactating Beef Cows^a						
900 and up	11.4	12.6	14.5	16.9	17.9	16.2
Mature Beef Bulls^a						
1,400	8.0	8.6	9.9	11.7	13.4	19.0
1,600 and up	8.7	9.4	10.8	12.6	14.5	20.6
Lactating Dairy Cows^b						
75 lbs/d milk	17.1	18.8	20.6	22.3	24.1	25.9
Horses and Mules						
---	8.0	8.8	9.6	10.4	11.2	12.0
Sheep						
---	1.5	1.9	2.3	2.7	3.1	3.5
Goat						
---	1.5	1.9	2.3	2.7	3.1	3.5
Swine						
per 100 lbs	1.0	1.1	1.2	1.3	1.4	1.5
Turkey						
per 100 lb	10.0	11.0	12.0	13.0	14.0	15.0
Chicken						
per 100 lb	6.0	6.6	7.2	7.8	8.4	9.0
^a Meehan, M.A., G. Stokka, and M. Mostrom. <i>Livestock Water Requirements</i> . 2015. NDSU Extension Service.						
^b Calculation from Murphy, M. R., C. L. Davis and G. C. McCoy. 1983. Factors affecting water consumption by Holstein cows in early lactation. <i>J. Dairy Sci.</i> 66: 35. Variables include typical temperature fluctuations, dry matter intake, milk production, and salt intake.						

Table 4. Body Condition Score Description (Adapted from Herd and Sprott, 1986)

BCS	Description
Thin	1 Bone structures are sharp to the touch. Little evidence of fat deposits or muscling.
	2 Little evidence of fat deposition but some muscling in hindquarters. Spinous process are sharp to the touch and easily seen with space between them.
	3 Slight fat cover over loin, back and foreribs. Backbone highly visible and spinous processes are identifiable by touch. Spaces between processes are less pronounced.
Borderline	4 Foreribs not noticeable. 12th and 13th rib still noticeable. Transverse processes identifiable only by palpation (slight pressure), feel rounded rather than sharp. Full but straightness of muscling in hindquarters.
	5 12th and 13th ribs not visible unless animal has been shrunk. The transverse spinous processes can only be felt with firm pressure to feel rounded—not noticeable to the eye. Spaces between the processes not visible and only distinguishable with firm pressure. Areas on each side of the tail head are fairly well filled but not mounded.
Ideal	6 Ribs fully covered, not noticeable to the eye. Hindquarters plump and full. Noticeable sponginess to covering of foreribs and on each side of the tail head. Palpation of the transverse process requires firm pressure.
	7 Ends of the spinous processes can only be felt with very firm pressure. Spaces between processes can barely be distinguished at all. Abundant fat cover on either side of tail head with some patchiness evident.
Fat	8 Animal taking on a smooth, blocky appearance; bone structure disappearing from sight. Fat cover thick and spongy with patchiness likely.
	9 Bone structure not seen or easily felt. Tail head buried in fat. Animal's mobility may actually be impaired by excess amount of fat.

Figure 1. Body Condition Score Palpation Guide (over the loin)

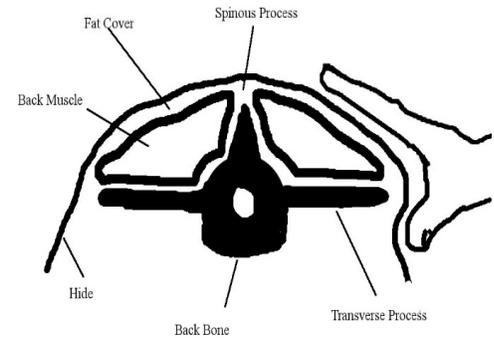


Figure 2. Cross Section of Body Condition Scores for Beef Cattle

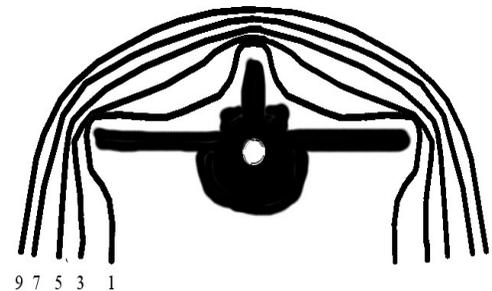


Table 5. Cattle Temperature Humidity Index Chart (Adapted from Herd and Sprott, 1986)

		Relative Humidity (%)												
		30	35	40	45	50	55	60	65	70	75	80	85	
Temperature (°F)	100	84	85	86	87	88	90	91	92	93	94	95	97	
	98	83	84	85	86	87	88	89	90	91	93	94	95	
	96	81	82	83	85	86	87	88	89	90	91	92	93	
	94	80	81	82	83	84	85	86	87	88	89	90	91	
	92	79	80	81	82	83	84	85	85	86	87	88	89	
	90	78	79	79	80	81	82	83	84	85	86	86	87	
	88	76	77	78	79	80	81	81	82	83	84	85	86	
	86	75	76	77	78	78	79	80	81	81	82	83	84	
	84	74	75	75	76	77	78	78	79	80	80	81	82	
	82	73	73	74	75	75	76	77	77	78	79	79	80	
	80	72	72	73	73	74	75	75	76	76	77	78	78	
	78	70	71	71	72	73	73	74	74	75	78	76	76	
	76	69	70	70	71	71	72	72	73	73	74	72	75	
Temperature Humidity Index (THI)														
		Normal <75			Alert 75-78			Danger 79-83			Emergency >84			

Table 6. Livestock Gestation Calendar

Date of Service	Date Animal is Due to Give Birth				
	Cow	Mare	Ewe	Doe	Sow
1-Apr-14	9-Jan-15	7-Mar-15	26-Aug-14	29-Aug-14	25-Jul-14
15-Apr-14	23-Jan-15	21-Mar-15	9-Sep-14	12-Sep-14	8-Aug-14
1-May-14	8-Feb-15	6-Apr-15	25-Sep-14	28-Sep-14	24-Aug-14
15-May-14	22-Feb-15	20-Apr-15	9-Oct-14	12-Oct-14	7-Sep-14
1-Jun-14	11-Mar-15	7-May-15	26-Oct-14	29-Oct-14	24-Sep-14
15-Jun-14	25-Mar-15	21-May-15	9-Nov-14	12-Nov-14	8-Oct-14
1-Jul-14	10-Apr-15	6-Jun-15	25-Nov-14	28-Nov-14	24-Oct-14
15-Jul-14	24-Apr-15	20-Jun-15	9-Dec-14	12-Dec-14	7-Nov-14
1-Aug-14	11-May-15	7-Jul-15	26-Dec-14	29-Dec-14	24-Nov-14
15-Aug-14	25-May-15	21-Jul-15	9-Jan-15	12-Jan-15	8-Dec-14
1-Sep-14	11-Jun-15	7-Aug-15	26-Jan-15	29-Jan-15	25-Dec-14
15-Sep-14	25-Jun-15	21-Aug-15	9-Feb-15	12-Feb-15	8-Jan-15
1-Oct-14	11-Jul-15	6-Sep-15	25-Feb-15	28-Feb-15	24-Jan-15
15-Oct-14	25-Jul-15	20-Sep-15	11-Mar-15	14-Mar-15	7-Feb-15
1-Nov-14	11-Aug-15	7-Oct-15	28-Mar-15	31-Mar-15	24-Feb-15
15-Nov-14	25-Aug-15	21-Oct-15	11-Apr-15	14-Apr-15	10-Mar-15
1-Dec-14	10-Sep-15	6-Nov-15	27-Apr-15	30-Apr-15	26-Mar-15
15-Dec-14	24-Sep-15	20-Nov-15	11-May-15	14-May-15	9-Apr-15
1-Jan-15	11-Oct-15	7-Dec-15	28-May-15	31-May-15	26-Apr-15
15-Jan-15	25-Oct-15	21-Dec-15	11-Jun-15	14-Jun-15	10-May-15
1-Feb-15	11-Nov-15	7-Jan-16	28-Jun-15	1-Jul-15	27-May-15
15-Feb-15	25-Nov-15	21-Jan-16	12-Jul-15	15-Jul-15	10-Jun-15
1-Mar-15	9-Dec-15	4-Feb-16	26-Jul-15	29-Jul-15	24-Jun-15
15-Mar-15	23-Dec-15	18-Feb-16	9-Aug-15	12-Aug-15	8-Jul-15
1-Apr-15	9-Jan-16	6-Mar-16	26-Aug-15	29-Aug-15	25-Jul-15
15-Apr-15	23-Jan-16	20-Mar-16	9-Sep-15	12-Sep-15	8-Aug-15
1-May-15	8-Feb-16	5-Apr-16	25-Sep-15	28-Sep-15	24-Aug-15
15-May-15	22-Feb-16	19-Apr-16	9-Oct-15	12-Oct-15	7-Sep-15
1-Jun-15	10-Mar-16	6-May-16	26-Oct-15	29-Oct-15	24-Sep-15
15-Jun-15	24-Mar-16	20-May-16	9-Nov-15	12-Nov-15	8-Oct-15
1-Jul-15	9-Apr-16	5-Jun-16	25-Nov-15	28-Nov-15	24-Oct-15
15-Jul-15	23-Apr-16	19-Jun-16	9-Dec-15	12-Dec-15	7-Nov-15
1-Aug-15	10-May-16	6-Jul-16	26-Dec-15	29-Dec-15	24-Nov-15
15-Aug-15	24-May-16	20-Jul-16	9-Jan-16	12-Jan-16	8-Dec-15
1-Sep-15	10-Jun-16	6-Aug-16	26-Jan-16	29-Jan-16	25-Dec-15
15-Sep-15	24-Jun-16	20-Aug-16	9-Feb-16	12-Feb-16	8-Jan-16
1-Oct-15	10-Jul-16	5-Sep-16	25-Feb-16	28-Feb-16	24-Jan-16
15-Oct-15	24-Jul-16	19-Sep-16	10-Mar-16	13-Mar-16	7-Feb-16