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2017 Nebraska Crop Budgets

Developed and
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Note: These budget projections were created using assumptions thought to be valid for many Nebraska producers; however, each farming operation is unique. These budgets are being released in both Adobe PDF and Excel® worksheet formats. The worksheet format allows producers to modify them to match their specific situation. The danger of releasing a tool that can subsequently be modified is that there is no way to verify whether alterations were made or unrealistic data was entered. Users of this tool are responsible for independently verifying all results prior to relying on them. Original files for these budgets are available at h*ttp://extension.unl.edu/publications* and on *http://cropwatch.unl.edu/economics/budgets*.

Additional Resource Persons

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2017 Crop Budgeting Procedures

This publication contains 73 crop production budgets for 15 crops, as well as tables for power, machinery, labor, and input costs used to develop these budgets. Each budget consists of five sections:

- Heading
- List of representative field operations
- List of materials and services used
- Operations and interest tabulations
- Overhead costs, including real estate taxes and opportunity charges

The budgets are presented in a worksheet format with a "Your Estimate" column for recording cost modifications.

Budget Divisions

The **heading** consists of the crop name, system description, and method of water application.

The **list of representative field operations** is organized in a table with columns for the operation name, quantity or number of times used with units, labor, fuel and lube, power source, and implement costs for both repairs and ownership. "Times" or "Quantity" is typically presented in acres with a decimal denoting where an operation is done on less than all of the acres or where it represents the probability of an operation being done. For those operations that are done multiple times, the number of times are listed. Swathing multiple cuttings of hay is an example. If a unit is other than "acres," it is specified in the "Unit" column. Other units used are bushels (bu), hundredweight (cwt), tons, and acre-inches (ai).

Labor costs for each operation were calculated from machinery accomplishment rates and adjusted for additional time required for getting machinery ready, adjusting machinery, and handling fertilizer and other supplies. The estimated costs for completing these operations are multiplied by the number in the "Times" or "Quantity" column, the product of which is multiplied by the hourly wage ($20 per hour) and the labor factor.

Fuel costs also use machinery accomplishment rates as well as estimated fuel consumption rates to determine fuel use. The fuel cost is multiplied by a lube factor of 1.15 and the price of energy, which is $2.25 per gallon for diesel and $0.105 per kWh for electricity. Repairs and depreciation costs were estimated using functions and factors from the *Agricultural Engineer's Yearbook*, which is published by the American Society of Agricultural and Biological Engineers. It requires making assumptions about the size and age of the equipment, which we did. We further assumed that machinery was fully utilized.

Data used to calculate power unit costs are in *Table 1* and data used for machinery operation costs are in *Table 2*. All units are acres unless noted in footnotes.

Irrigation costs were calculated using engineering performance standards and typical water application rates, which will depend on the rainfall area. Repair and ownership costs for the power component of the irrigation system refer to the pump and power unit. Repair and ownership costs for the implement component refer to the delivery system (pipe or pivot).

The list of materials and services used is calculated by multiplying the application rate by the application price (*Table 3*) and then by the percent acres applied. A value less than 100 percent is used when a material or service is applied on only part of the acres or part of the time. For example, fields planted with Bt corn seed must have 20 percent of the acres planted to a refuge crop. There would be 20 percent in the column called "Percent Acres Applied" for the non-Bt seed and 80 percent for the Bt seed. Another example is when a practice is not always used. If an insecticide is used one year out of four, a "25 percent" would be entered in the column "Percent Acres Applied." The cost for each material/service is computed by multiplying the percentage of acres by the quantity per acre and then by the price per unit. Note: All prices for materials and services in the budgets were obtained in October 2016.

The value in the "Operation Index" column in the "Materials and Services" section indicates the corresponding operation in the "Field Operations" section. Data for calculating materials cost is in *Table 3*.

The **operations and interest** tabulations are

the sum of totals of the first two sections with interest calculated on the cash costs. Cash costs in interest calculations include labor, fuel, and repairs from the list of field operations and all costs from the materials and services.

Overhead costs include accounting, liability insurance, vehicle cost, and office expense. Real estate cost is calculated using values from the UNL publication *Nebraska Farm Real Estate Market Developments* published in June 2016 times an investment rate of 4 percent. Taxes on real estate are not included in interest calculations because in Nebraska they are due at the end of the year in which they accrue and are not delinquent until May and September of the following year.

A **production cost and cash cost** per unit of production is calculated. The cost per unit of production is the sum of all costs divided by the projected yield. The cash cost per unit of production does not include machinery power and implement ownership, overhead, and real estate opportunity costs.

It should be noted that these budgets are cost estimates only and have no estimates as to profitability.

Benefits of Soybeans in Corn/Soybean Rotation

The budgets for continuous soybeans are different from the budgets for soybeans after corn. A direct comparison of these budgets does not tell the entire story as some of the benefits from soybeans in a corn/soybean rotation are realized in the following corn crop.

One benefit is decrease of the corn rootworm problem. When corn follows soybeans, the rootworm insecticide can be omitted and purchasing corn seed with the root worm trait is not necessary. This amounts to approximately a $15 per acre savings to the following corn crop.

A second benefit is corn following soybeans will typically yield more. This increase is between 4 to 10 bushels per acre for irrigated corn and 10 to 30 bushels for dryland corn. Using a 10 bushel increase in corn and a price of $3 per bushel results in a $30 per acre increase in income.

A final benefit is the value of nitrogen produced by the soybean crop. If the soybeans produce 45 pounds of nitrogen per acre, this amounts to a savings to the corn crop of $18 per acre when nitrogen costs forty cents a pound.

The above benefits amount to $63 per acre, which does not include the benefits of spreading labor and machinery use requirements out over a longer time frame.

However, additional phosphorus must be applied to replace that used by the soybeans in a corn crop following soybeans. This amounts to about 0.8 pound for every bushel of soybeans produced. The cost to replace 48 pounds of P_2O_5 needed for a 60 bushel per acre soybean crop would be approximately $18 per acre.

Table 1. Power Unit Cost Data Used for 2017 Budgets

Name	*List Price*	*Age*	*Total Tach*	*Est. Hours per Year*
Large Tractor	331,066	10	1,500	300
Medium Tractor	224,262	5	2,500	500
Combine	351,122	10	1,500	300
Electric Pump	10,500	5	2,400	800
Diesel Pump for Pivot	15,750	10	2,400	800
Diesel Pump for Pipe	15,750	10	2,400	800
Windrower	150,309	10	2,500	120

Table 2. Machinery Cost Data Used for 2017 Budgets

Operation Name	*List Price*	*Age*	*Annual Use*	*Units*	*Units per Hour*	*Diesel Use per Hour*
Anhydrous Apply	N/A	5	500	acre	12	6.36
Bale Large Round	22,417	5	1,000	ton	10	2.88
Bale Large Square	120,658	5	1,000	ton	16	6.19
Bale Small Square	24,555	5	1,250	ton	4	3.50
Cart	42,000	5	440,000	bushel	1,540	3.00
Chisel	59,791	5	2,000	acre	11	8.26
Chop Stalks	19,971	5	500	acre	12	5.74
Combine Dryland Corn	53,013	5	1,000	acre	7	10.50
Combine Dryland SB	32,435	5	1,000	acre	7	10.50
Combine Dryland SG	32,435	5	1,000	acre	7	10.50
Combine Irrigated Corn	32,435	5	1,000	acre	7	10.50
Combine Irrigated Dry Beans	53,013	5	1,000	acre	5	10.50
Combine Irrigated SB	32,435	5	1,000	acre	6	10.50
Combine Irrigated SG	32,435	5	1,000	acre	7	10.50
Combine Irrigated Dry Beans with Draper Flex Platform	32,435	5	1,000	acre	5	10.50
Combine Small Grain	32,435	5	1,000	acre	7	10.47
Combine Sunflowers	32,435	5	1,000	acre	7	10.50
Corrugate	53,013	5	1,000	acre	7	10.50
Disk	30,000	5	300	acre	7	4.39
Double Windrows	44,962	5	2,000	acre	11	8.29
Drill	7,403	20	300	acre	20	2.11
Drill Grass	66,251	10	1,000	acre	13	4.99
Drill No-Till	73,000	10	1,000	acre	9	4.29
Drill w/ Fertilizer	66,251	5	1,000	acre	12	6.07
Fallow Master	66,251	10	1,000	acre	11	5.00
Field Cultivation	59,791	5	2,000	acre	13	8.62
Harrow	59,791	5	2,000	acre	15	8.20
Irrigation Ditch		5	1,000	acre	19	2.05
Irrigation Pipe D 125' Lift	N/A	5	1,000	acre-inch	2	-
Irrigation Pivot D 125' Lift	N/A	10	2,600	acre-inch	2	3.03
Irrigation Pivot D 125' Lift w/fertigation	70,000	10	2,600	acre-inch	2	3.34
Irrigation Pivot E 125' Lift	75,000	10	2,600	acre-inch	2	3.34
Irrigation Pivot E 125' Lift w/fertigation	70,000	10	2,600	acre-inch	2	
Lift Beets	75,000	10	2,600	acre-inch	2	
Load Large Square	110,000	5	1,000	acre	6	6.19
Move Large Round	4,213	5	3,000	ton	20	4.00
Pickett Windrower	4,213	5	3,000	ton	20	4.00
Plant	32,000	5	1,000	acre	10	6.07
Plant Narrow Row	72,828	5	1,000	acre	10	2.73
Plant No-Till	72,828	5	1,000	acre	10	2.58
Plow	126,703	5	1,000	acre	10	3.38
Ridge Cultivate/Ditch	15,874	5	1,000	acre	8	6.00
Ridge Cultivation	30,000	5	1,000	acre	12	5.33
Ridge Plant and Band Herbicide	30,000	5	1,500	acre	10	5.33
Rod Weeder	126,703	5	1,500	acre	10	3.41
Rod Weeder & Fertilizer		5	1,000	acre	13	5.35
Roll		5	1,000	acre	13	5.35
Roller Harrow		5	300	acre	9	5.46
Rotary Hoe	30,000	5	1,000	acre	10	5.00
Row Crop Cultivation	25,000	5	1,000	acre	15	3.67
Seeder/Packer	30,000	5	1,000	acre	11	3.50
	62,545	5	1,000	acre	8	4.29

Table 2. Machinery Cost Data Used for2017 Budgets (Continued)

Operation Name	*List Price*	*Age*	*Annual Use*	*Units*	*Units per Hour*	*Diesel Use per Hour*
Spray	36,000	5	2,500	acre	25	2.64
Spray (Prior Year Stubble)	36,000	5	2,500	acre	25	2.64
Spray Fertilizer	36,000	5	1,000	acre	25	2.64
Spray Fertilizer and Herbicide	36,000	5	1,000	acre	25	2.64
Spray Spring Burndown Herbicide	36,000	5	2,500	acre	25	2.64
Spread Fertilizer	N/A	5	1,000	acre	13	3.86
Stack Small Square	13,000	5	1,250	ton	10	2.00
Subsoil	59,791	5	500	acre	9	8.25
Swath/Condition Hay	-	5	2,000	acre	10	5.00
Till Plant Beets	48,000	5	1,000	acre	6	8.25
Top Beets	50,000	5	1,000	acre	6	3.50
Turn Windrows	7,403	5	1,000	acre	12	2.10
Windrow Grain	-	5	3,000	acre	10	5.00

Table 3. Material Prices Used for 2017 Budgets

Item	*Price per Unit*
Additive	
21-0-0-24S	$0.35/pound
Crop Oil Concentrate	$9.00/gallon
NIS	$16.00/gallon
UAN	$1.50/gallon

Custom	
Aerial Spray	$10.00/acre
Bale Lg Sq 1360 lb	$15.00/bale
Chop, Haul, Pack	$10.75/ton
Dry 2 Points Removed	$0.08/bushel
Haul & Apply Manure	$6.00/ton
Haul Beets	$5.00/ton
Haul Grain (Dry Beans)	$0.28/cwt
Haul Grain (Millet)	$0.24/cwt
Haul Grain (Sunflower)	$0.30/cwt
Haul Grain Bushels	$0.11/bushel
Load Large Square Bales	$2.00/bale
Spray	$7.00/acre

Item	*Price per Unit*
Fertilizer	
10-34-0	$2.40/gallon
10-34-0-1Z	$2.45/gallon
11-52-0	$0.24/pound
28-0-0	$1.30/gallon
32-0-0	$0.42/lb N
32-0-0 (Applied by Pivot)	$0.42/lb N
32-0-0 (Applied by R2)	$0.42/lb N
46-0-0	$0.38/lb N
82-0-0	$0.28/lb N
Uncomposted manure	$1.00/ton

Fungicide	
Copper	$3.50/pint
Headline AMP	$340.00/gallon
Pea Seed Innoculent	$8.00/pound
Priaxor	$700.00/gallon
Quadris	$300.00/gallon
Quilt Xcel	$220.00/gallon
Stratego YLD	$600.00/gallon
Tilt	$105.00/gallon

Table 3. Material Prices Used for 2017 Budgets (Continued)

Item	*Price per Unit*
Herbicide	
2,4-D Amine	$14.00/gallon
2,4-D Ester 4#	$18.00/gallon
AAtrex 4L	$20.00/gallon
Acuron	$77.00/gallon
Aim 2EC	$200.00/quart
Ally Extra SGW/TOTSOL	$9.00/ounce
Atrazine 4L	$14.00/gallon
Atrazine 90 DF	$3.30/pound
Authority First DF	$95.00/pound
Balance Flexx	$6.00/ounce
Basagran	$80.00/gallon
Beyond	$625.00/gallon
Bicep II Magnum	$48.00/gallon
Brox 2EC	$34.00/gallon
Dicamba	$50.00/gallon
Distinct	$40.00/gallon
Expert	$37.00/gallon
Glyphosate w/Surf	$12.50/gallon
Gramoxone SL	$38.00/gallon
Huskie	$120.00/gallon
Landmaster BW	$19.00/gallon
Laudis	$830.00/gallon
Lumax EZ	$80.00/gallon
Outlook	$150.00/gallon
Peak	$18.00/ounce
Prowl H2O	$52.00/gallon
Pursuit	$490.00/gallon
Raptor	$610.00/gallon
Roundup WeatherMax	$32.00/gallon
Rugged	$45.00/gallon
Select Max	$110.00/gallon
Sharpen	$900.00/gallon
Spartan 4F	$600.00/gallon
Spirit	$12.00/ounce
Status	$4.30/ounce
Valor XLT	$92.00/pound
Velpar 75DF	$37.00/pound
Vida	$9.00/ounce

Item	*Price per Unit*
Insecticide	
Asana XL	$85.00/gallon
Brigade 2EC	$145.00/gallon
Capture LFR	$360.00/gallon
Lorsban 15 G	$2.65/pound
Lorsban 4 E	$55.00/gallon
Lorsban Advanced	$55.00/gallon
Mustang Max EC	$190.00/gallon
Regent 4 SC	$9.90/ounce
Warrior II/Zeon	$380.00/gallon

Other	
Electricity Fixed	$30.00/acre
Electricity Usage	$0.11/kw
Fence/Water Repairs	$260.00/circle
Irrigation District O&M Charge	$30.00/acre
Move Cattle	$20.00/hour
Twine Large Round	$0.70/bale
Twine Large Square	$1.23/bale
Twine Small Square	$0.07/bale

Rental	
Grass Drill	$15.00/acre
Seeder/Packer	$13.00/acre

Scouting	
Scouting Dry Beans	$10.00/acre
Scouting Dryland Corn	$7.00/acre
Scouting Dryland Soybeans	$7.00/acre
Scouting Dryland Wheat	$7.00/acre
Scouting Grain Sorghum	$7.00/acre
Scouting Irrigated Corn	$9.00/acre
Scouting Irrigated Soybeans	$9.00/acre
Scouting Irrigated Wheat	$9.00/acre
Scouting Sugar Beets	$16.00/acre

Table 3. Material Prices Used for 2017 Budgets (Continued)

Item	*Price per Unit*
Seed	
Alfalfa RR w/Inoculant	$9.00/pound
Alfalfa w/Inoculant	$6.00/pound
Corn	$200.00/bag
Corn Bt & ECB	$230.00/bag
Corn Bt, ECB & RW	$230.00/bag
Corn Bt, ECB, RW & RR2	$270.00/bag
Corn ECB & RR2	$260.00/bag
Corn RR2	$240.00/bag
Corn SmartStax RIB Complete	$330.00/bag
Cover Crop	$15.00/acre
Cover Crop Legume	$30.00/acre
Edible Beans	$92.00/cwt
Grass Seed	$75.00/acre
Millet	$0.45/pound
Oats	$9.00/bushel

Item	*Price per Unit*
Seed	
Peas	$18.00/bushel
RR Soybeans	$50.00/bag
RR Soybeans Treated	$65.00/bag
RR2 Soybeans Extend	$65.00/bag
RR2 Soybeans Treated	$65.00/bag
Sorghum Safened/Insect	$2.10/pound
Sorghum Sudan	$0.60/pound
Sorghum Sudan (Treated)	$0.80/pound
Sorghum Sudan Brown (Treated)	$1.50/pound
Sorghum Sudan Brown Midrib	$1.30/pound
Sugar Beets RR Poncho	$180.00/acre
Sunflower Clearfield	$320.00/bag
Wheat	$0.10/pound
Wheat (Certified and Treated)	$0.20/pound

Converting Energy Numbers in Budgets

If your energy source is different from that used in the 2017 crop budgets, use *Table 4*, developed by Extension Irrigation Engineer Derrel Martin, to convert from diesel to other energy sources.

For example, to convert diesel in gallons to kilowatt-hours of electricity, the multiplier is 14.12. If electricity is $0.138 per kilowatt, the calculation would be 14.12 x 0.138 = $1.95. The 2017 crop budgets use $2.25/gallon of diesel. If you use electricity, the cost would be about 50 percent of that cost. However, with electricity you must also include connect charges, and in order to get the best rates, you'll need to sign up for load management.

Table 4. Conversion of Diesel to Electricity *Propane, Gasoline, and Natural Gas**.

Energy Source	Units	Multiplier
Electricity	Kilowatt-hours	14.12
Propane	Gallons	1.814
Gasoline	Gallons	1.443
Natural Gas	1000 Cubic Feet	0.2026

*Source: Estimating the Savings from Improving Pumping Plant Performance by Nebraska Extension Irrigation Specialist Derrel Martin

Diesel Fuel Conversion for Center Pivots

The 2017 crop production budgets with center pivot irrigation were developed with a pumping lift of 125 feet and 35 psi pressure to determine the amount of diesel fuel used per hour. *Table 5* was developed by Derrel Martin to determine the amount of diesel fuel for various pumping lifts and pressures to pump an acre-inch of water.

For example, the amount of diesel required to pump an acre-inch of water with 125 feet of lift at 35 psi is 1.88 gallons with a pump performance rating of 100 percent. If the producer has a lift of 300 feet and a pressure of 50 psi, the diesel fuel required at a performance rating of 100 percent is 3.79 gallons per acre-inch. If the rating on the producer's pump is 80 percent, the diesel fuel required will be 4.74 gallons per acre-inch of water.

With this information, the producer can calculate the additional cost since the diesel fuel required is now 4.74 gallons per acre-inch vs. 1.88 gallons per acre-inch. This is 2.86 gallons more per acre-inch. If a crop budget requires 9 inches, the additional diesel fuel would be 25.74 gallons of diesel at $2.25/gallon (9 inches x 2.86 gallons). The producer's additional cost would be $57.92/acre.

Table 5. Table for adjusting the amount of diesel fuel required by center pivots for lifts and pressures other than the 125 feet of lift and 35 PSI used in the budgets. Gallons of diesel fuel required to pump an acre-inch of water at pump performance ratings of 100 percent*

Lift Feet	Pressure at							
	10	20	30	35	40	50	60	80
0	0.21	0.42	0.63	0.74	0.84	1.05	1.26	1.69
25	0.44	0.65	0.86	0.97	1.07	1.28	1.49	1.91
50	0.67	0.88	1.09	1.20	1.30	1.51	1.72	2.14
75	0.89	1.11	1.32	1.43	1.53	1.74	1.95	2.37
100	1.12	1.33	1.54	1.65	1.75	1.97	2.18	2.60
125	1.35	1.56	1.77	1.88	1.98	2.19	2.40	2.83
150	1.58	1.79	2.00	2.11	2.21	2.42	2.63	3.05
200	2.03	2.25	2.46	2.57	2.67	2.88	3.09	3.51
250	2.49	2.70	2.91	3.02	3.12	3.33	3.54	3.97
300	2.95	3.16	3.37	3.48	3.58	3.79	4.00	4.42
350	3.40	3.61	3.82	3.93	4.03	4.25	4.46	4.88
400	3.86	4.07	4.28	4.39	4.49	4.70	4.91	5.33

*Multiplier when pumping plant performance rating is less than 100 percent.

Rating %	100	90	80	70	60	50
Multiplier	1.00	1.11	1.25	1.43	1.67	2.00

* Source: *Estimating the Savings From Improving Pumping Plant Performance* by Nebraska Extension Irrigation Specialist Derrel Martin.