



# Irrigated Alfalfa, Barley, Corn, and Sugar Beet Budgets

*for the Big Horn Basin, Wyoming*

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## IRRIGATED ALFALFA (ESTABLISHING), BIG HORN BASIN, WYOMING

This crop budget is a representative model of establishing irrigated alfalfa in northwest Wyoming. The budget contains estimated costs for one year of alfalfa production. Operation costs in the budget represent the best estimates from multiple sources in northwest Wyoming (Big Horn Co-op, personal communication, October 2019) (P. Kukowski, personal communication, October 2019), as well as University of Nebraska state crop budgets (Klein et al., 2019). University of Minnesota machinery cost estimates (Lazarus, 2019) were used to establish use-related and total costs.

Wyoming ranks 17th among all states in terms of alfalfa production and over 25 percent of production occurred in the northwest region of the state (USDA-NASS, 2018). In terms of acreage, alfalfa is the second most widely produced crop in the state behind grass hay.

### Land

This budget is based on the assumption the land base is owned by the producer. Real estate opportunity cost is assumed to be 4 percent per acre of the land value. Real estate taxes are assumed to be 0.74 percent per acre which is based off of the 2019 mill levy assessed property tax rate in northwest Wyoming, no water tax is figured into this budget. The land value is estimated at \$2,430 per acre, this is the average value of irrigated cropland in Wyoming according to the most current United States Agricultural Statistics Service Survey, released August 2019 (USDA-NASS, 2019b).

### Labor

Labor in this budget is assumed to be provided by the landowner at the rate of \$20 per hour for all field operations.

### Capital

Interest on operating capital is included at 6.5 percent. This is based on the Wall Street Journal Prime rate (WSJP) current rate of 5.0 percent and the assumption individual lenders will raise personal rates at least an additional 1.5 percent (“Farm Operating Loans: Farm Equity Line of Credit Loans”). This percentage is the rate at which the

lending institution is charging the operation on loaned capital. Interest is charged on operating capital for cash expenses biannually. This percentage should be adjusted based on the individual producer’s situation.

### Field Operations

This enterprise budget is based on the annual assumed yield of 2.5 ton per acre (Klein et al., 2019). This is an assumed average yield for establishing irrigated alfalfa for the first year of production in northwest Wyoming. Due to the variability in products and premiums, no crop insurance is assumed for this budget, and individual operations should adjust this assumption if they purchase crop insurance. One fertilizer application is included, a dry formulation mix, 11-52-0. Round-Up Ready seed is used in this budget which accounts for the higher seed price as compared to conventional alfalfa seed. Also, one application of a pesticide and herbicide was accounted for which is common practice for establishing alfalfa stands. While gravity irrigation has been historically more prevalent in this area, center pivot irrigation is assumed in this budget as more crop-ground is expected to be converted to this irrigation type. Pivot costs are separated into use-related and ownership related. Cost per acre of ownership is assumed to be \$62.61/acre, while use related differs by acre-inch of water (USDA-NRCS, 2017).

Power costs and labor costs make up the use-related costs. Power sources for the motor vary between natural gas, single phase to three phase converted electricity and straight three phase electricity. (Other power sources such as diesel may be used, however it is not common in northwest Wyoming, so it was excluded from our budget.) Averages from these three power sources gave us a cost of power per acre inch of water. Per acre use-related and total cost for implement, with associated power units, are averaged over all sizes by implement type in the field operation portion of the budget. Using this approach accounts for all possible tractor types and horsepower sizes.

Irrigated Alfalfa (Establishing), Northwest Wyoming, 2019						
Establishing Alfalfa 2.5 ton/acre						
Pivot irrigated, ground water, 16 acre inches						
<b>Establishing Alfalfa</b>						
				<b>Use Related</b>	<b>Total</b>	<b>Your</b>
<b>Field Operations</b>				<b>Cost/Acre</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
Pre-Plant Fall						
Soil Tests				\$ 0.65	\$ 0.65	\$
Pre-Plant Spring						
Spread Fertilizer				\$ 3.12	\$ 5.24	\$
Field Cultivations				\$ 4.98	\$ 8.08	\$
Deep Rip (Plow)				\$ 8.84	\$ 15.25	\$
Disc				\$ 8.50	\$ 12.40	\$
Roller Harrow				\$ 4.94	\$ 7.30	\$
Plant						
Drill Seed				\$ 9.06	\$ 13.41	\$
Grow						
Spray Herbicide Application				\$ 3.00	\$ 5.00	\$
Pivot Irrigation				\$ 52.38	\$ 114.99	\$
Harvest						
Self Propelled Swather				\$ 11.48	\$ 18.14	\$
Large Rectangular Baler				\$ 12.41	\$ 19.15	\$
Stack and Load				\$ 5.26	\$ 8.63	\$
<b>Total Field Operations</b>				<b>119.36</b>	<b>219.61</b>	<b>\$</b>
<b>Materials and Services</b>	<b>Type</b>	<b>Rate</b>	<b>Unit</b>	<b>Per Unit</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
Fertilizer	11-52-0	78	lbs P2O5	\$ 0.28	\$ 21.84	\$
Seed	Roundup Ready with Inoculant	12	lbs	\$ 7.50	\$ 90.00	\$
Spray	Pesticide	1.5	pt.	\$ 5.21	\$ 7.82	\$
	Glyphosate	36	oz	\$ 0.13	\$ 4.74	\$
Other	Twine Large Square	2.5	ton	\$ 1.81	\$ 4.53	\$
<b>Total Materials and Services</b>					<b>\$ 128.92</b>	<b>\$</b>
Total Listed Costs for Operations, and Materials, and Services					\$ 348.53	\$
Annual Interest on Operation Capital	Cash Related/Non-Ownership	6.50%		\$ 248.28	\$ 16.14	\$
<b>Total Operations and Materials and Services</b>					<b>\$ 364.67</b>	<b>\$</b>
Overhead	Insurance, Vehicles, Office				\$ 20.00	\$
Real Estate Opportunity Cost	Wyoming Irrigated	\$ 2,430	acre	4.00%	\$ 97.20	\$
Real Estate Taxes		\$ 2,430	acre	0.74%	\$ 17.86	\$
<b>Total Cost Including Overhead</b>					<b>\$ 499.73</b>	<b>\$</b>
<b>Cost per Ton</b>					<b>\$ 199.89</b>	<b>\$</b>
<b>Cash Cost per Ton</b>					<b>\$ 105.77</b>	<b>\$</b>
<b>Notes:</b> Only one cutting is expected off of the establishing alfalfa stand whereas three cuttings is typical from an established stand. Also one application of a pesticide and herbicide are standard practice in this situation.						

## Sources

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## IRRIGATED ALFALFA (ESTABLISHED), BIG HORN BASIN, WYOMING

This crop budget is a representative model of established irrigated alfalfa production in northwest Wyoming. The budget contains estimated costs for one year of alfalfa production. Operation costs in the budget represent the best estimates from multiple sources in northwest Wyoming (Big Horn Co-op, personal communication, October 2019) (P. Kukowski, personal communication, October 2019), as well as University of Nebraska state crop budgets (Klein et al., 2019). University of Minnesota machinery cost estimates (Lazarus, 2019) were used to establish use-related and total costs.

Wyoming ranks 17th among all states in terms of alfalfa production and over 25 percent of production occurred in the northwest region of the state (USDA-NASS, 2018). In terms of acreage, alfalfa is the second most widely produced crop in the state behind grass hay.

### Land

This budget assumes the land base is owned by the producer. Real estate opportunity cost is assumed to be 4 percent per acre of the land value. Real estate taxes are assumed to be 0.74 percent per acre which is based on the 2019 mill levy assessed property tax rate in northwest Wyoming, no water tax is assumed for these budgets. The land value is estimated at \$2,430 per acre, this is the average value of irrigated cropland in Wyoming according to the most current United States Agricultural Statistics Service Survey, released August 2019 (USDA-NASS, 2019b).

### Labor

Labor in this budget is assumed to be provided by the landowner at the rate of \$20 per hour for all field operations.

### Capital

Interest on operating capital is included at 6.5 percent. This is based on the Wall Street Journal Prime rate (WSJP) current rate of 5.0 percent and the assumption individual lenders will raise personal rates at least an additional 1.5 percent (“Farm Operating Loans: Farm Equity Line of Credit Loans”). This percentage is the rate at which the lending institution is charging the operation on loaned

capital. Interest is charged on operating capital for cash expenses biannually. This percentage should be adjusted based on the individual producer’s situation.

### Field Operations

This enterprise budget is based on the annual assumed yield of 6 ton per acre (Holmgren and Pace, 2016) and three swathing operations. This is an assumed average yield for irrigated alfalfa in northwest Wyoming. Due to the variability in products and premiums, no crop insurance is assumed for this budget, and individual operations should adjust this assumption if they purchase crop insurance.

One fertilizer application is included in this budget, a dry formulation mix, 11-52-0. While gravity irrigation has been historically more prevalent in this area, center pivot irrigation is assumed in this budget as more crop-ground is expected to be converted to this irrigation type. Pivot costs are separated into use-related and ownership related. Cost per acre of ownership is assumed to be \$62.61/acre, while use related differs by acre-inch of water (USDA-NRCS, 2017). Power costs and labor costs make up the use-related costs.

Power sources for the motor vary between natural gas, single phase to three phase converted electricity and straight three phase electricity. (Other power sources such as diesel may be used, however it is not common in northwest Wyoming so it was excluded from our budget.) Averages from these three power sources gave us a cost of power per acre inch of water. Per acre use-related and total cost for implement, with associated power units, are averaged over all sizes by implement type in the field operation portion of the budget. Using this approach accounts for all possible tractor types and horsepower sizes.

Irrigated Alfalfa (Established), Northwest Wyoming, 2019						
Established Alfalfa 6 ton/acre						
Pivot irrigated, ground water, 16 acre inches						
<b>Established Alfalfa</b>						
				<b>Use Related</b>	<b>Total</b>	<b>Your</b>
<b>Field Operations</b>				<b>Cost/Acre</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
Spread Fertilizer				\$ 3.12	\$ 5.24	\$
Pivot Irrigation				\$ 46.56	\$ 109.17	\$
Self Propelled Swather				\$ 15.47	\$ 20.81	\$
Large Rectangular Baler				\$ 13.01	\$ 22.78	\$
Stack and Load				\$ 9.02	\$ 15.59	\$
<b>Total Field Operations</b>				<b>\$ 87.18</b>	<b>\$ 173.59</b>	<b>\$</b>
<b>Materials and Services</b>	<b>Type</b>	<b>Rate</b>	<b>Unit</b>	<b>Per Unit</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
Fertilizer	11-52-0		78 lbs P2O5	\$ 0.28	\$ 21.84	\$
Spray	Pesticide		1.5 pt.	\$ 5.21	\$ 7.82	\$
Other	Twine Large Square		6 ton	\$ 1.81	\$ 10.86	\$
<b>Total Materials and Services</b>					<b>\$ 40.52</b>	<b>\$</b>
Total Listed Costs on Operations, and Materials and Services					\$ 214.11	\$
Annual Interest on Operation Capital		6.50%		\$ 127.69	\$ 8.30	\$
<b>Total Operations, Materials, and Services</b>					<b>\$ 222.41</b>	<b>\$</b>
Overhead	Insurance, Vehicles, Office				\$ 20.00	\$
Real Estate Opportunity Cost	Wyoming Irrigated		\$ 2,430 acre	4.00%	\$ 97.20	\$
Real Estate Taxes			\$ 2,430 acre	0.74%	\$ 17.86	\$
<b>Total Cost Including Overhead</b>					<b>\$ 357.47</b>	<b>\$</b>
<b>Cost per Ton</b>					<b>\$ 59.58</b>	<b>\$</b>
<b>Cash Cost per Ton</b>					<b>\$ 22.67</b>	<b>\$</b>
<b>Notes:</b> 6 ton/acre is considered average in the Big Horn Basin. The pesticide used was Yuma, which is a generic Lorsban. Most established alfalfa is not treated with a herbicide so that is not included. 11-52-0 also provides 16 lbs of nitrogen per acre.						

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## IRRIGATED BARLEY FOR GRAIN, BIG HORN BASIN, WYOMING

This crop budget is a representative model of irrigated barley harvested for grain production in northwest Wyoming. The budget contains estimated costs for one year of barley production. Operation costs in the budget represent the best estimates from multiple sources in northwest Wyoming (Big Horn Co-op, personal communication, October 2019) (P. Kukowski, personal communication, October 2019), as well as University of Nebraska state crop budgets (Klein et al., 2019). University of Minnesota machinery cost estimates (Lazarus, 2019) were used to establish use-related and total costs.

Barley in Wyoming has two major markets, malt barley and feed barley for livestock. This budget looks at malt barley as that is most common in the northwest part of the state. Many different spring malt barley varieties are planted in northwest Wyoming. The Moravian 69 variety has historically been the most popular seed variety in the state (USDA-NASS, 2012). Different varieties continue to become more prevalent throughout the state, such as Merit 57. Seventy-one thousand acres of barley were planted in northwest Wyoming in 2016, which was 75 percent of the barley planted in the state (USDA-NASS, 2018).

### Land

This budget assumes the land base is owned by the producer. Real estate opportunity cost is assumed to be 4 percent per acre of the land value. Real estate taxes are assumed to be 0.74 percent per acre which is based on the 2019 mill levy assessed property tax rate in northwest Wyoming, no water tax is assumed for these budgets. The land value is estimated at \$2,430 per acre, this is the average value of irrigated cropland in Wyoming according to the most current United States Agricultural Statistics Service Survey, released August 2019 (USDA-NASS, 2019b).

### Labor

Labor in this budget is assumed to be provided by the landowner at the rate of \$20 per hour for all field operations except the custom trucking.

### Capital

Interest on operating capital is included at 6.5 percent. This is based on the current Wall Street Journal Prime Rate (WSJP) rate of 5.0 percent and the assumption individual lenders will raise personal rates at least an additional 1.5 percent (“Farm Operating Loans: Farm Equity Line of Credit Loans”). This percentage is the rate at which the lending institution is charging the operation on loaned capital. Interest is charged on operating capital for cash expenses biannually. This percentage should be adjusted based on the individual producer’s situation.

### Field Operations

This enterprise budget is based on the assumed yield of 95 bushels per acre. This is an average yield for irrigated barley in northwest Wyoming. Due to the variability in products and premiums, no crop insurance is assumed for this budget, and individual operations should adjust this assumption if they purchase crop insurance. One fertilizer application is included in this budget, a pre-plant dry formulation mix, 105-50-30.

While gravity irrigation has been historically more prevalent in this area, center pivot irrigation is assumed in this budget as more crop-ground is expected to be converted to this irrigation type. Pivot costs are separated into use-related and ownership related. Cost per acre of ownership is assumed to be \$62.61/acre, while use related differs by acre-inch of water (USDA-NRCS, 2017).

Power costs and labor costs make up the use-related costs. Power sources for the motor vary between natural gas, single phase to three phase converted electricity and straight three phase electricity. (Other power sources such as diesel may be used, however it is not common in northwest Wyoming so it was excluded from our budget.) Averages from these three power sources gave us a cost of power per acre inch of water.

Barley is planted in the spring and the budget assumes planting with a conventional grain drill. Barley for grain is harvested in the fall, typically with a direct-cut combine head. Per acre use-related and total cost for implement,



with associated power units, are averaged over all sizes by implement type in the field operation portion of the

budget. Using this approach accounts for all possible tractor types and horsepower sizes.

Irrigated Barley for Grain, Northwest Wyoming, 2019						
Barley, Spring Field Work, 95 bushel/acre						
Pivot irrigated, ground water, 6 acre inches						
<b>Barley</b>						
				<b>Use Related</b>	<b>Total</b>	<b>Your</b>
<b>Field Operations</b>				<b>Cost/Acre</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
<b>Pre-Plant Fall</b>						
Soil Tests				\$ 0.65	\$ 0.65	\$
<b>Pre-Plant Spring</b>						
Spread Fertilizer				\$ 3.12	\$ 5.24	\$
Field Cultivations				\$ 4.98	\$ 8.08	\$
Deep Rip (Plow)				\$ 8.84	\$ 15.25	\$
Disc				\$ 8.50	\$ 12.40	\$
Roller Harrow				\$ 4.94	\$ 7.30	\$
Haul Seed				\$ 0.46	\$ 0.46	\$
<b>Plant</b>						
Plant Barley				\$ 9.06	\$ 13.41	\$
<b>Grow</b>						
Row Crop Cultivation				\$ 5.76	\$ 8.94	\$
Spray Herbicide Application				\$ 3.00	\$ 5.00	\$
Pivot Irrigation				\$ 17.46	\$ 80.07	\$
<b>Harvest</b>						
Combine Small Grain				\$ 15.76	\$ 24.16	\$
Grain Cart				\$ 14.85	\$ 15.72	\$
Truck				Custom		\$
<b>Total Field Operations</b>				<b>\$ 97.38</b>	<b>\$ 196.67</b>	<b>\$</b>
<b>Materials and Services</b>	<b>Type</b>	<b>Rate</b>	<b>Unit</b>	<b>Price</b>	<b>Total</b>	<b>Your</b>
Pre-Plant	46-0-0 Granular Fertilizer	206	lbs N	\$ 0.24	\$ 48.93	\$
	11-52-0 MAP Fertilizer	97	lbs P2O5	\$ 0.28	\$ 27.16	\$
	0-0-60 Fertilizer	49	lbs K2O	\$ 0.22	\$ 10.54	\$
At Plant	Moravian 69	110	lbs seed	\$ 0.25	\$ 27.84	\$
Custom Herbicide	Broadleaf Herbicide	24	oz	\$ 0.49	\$ 11.75	\$
Harvest	Haul Grain Bushels	95	bushel	\$ 0.20	\$ 19.00	\$
<b>Total Materials and Services</b>					<b>\$ 145.22</b>	<b>\$</b>
Total Listed Costs for Operations, and Materials, and Services					\$ 341.89	\$
Annual Interest on Operation Capital	Cash Related/Non-Ownership	6.50%		\$ 242.59	\$ 15.77	\$
<b>Total Operations and Materials and Services</b>					<b>\$ 357.66</b>	<b>\$</b>
Overhead	Insurance, Vehicles, Office				\$ 20.00	\$
Real Estate Opportunity Cost	Wyoming Irrigated	\$ 2,430	acre	4.00%	\$ 97.20	\$
Real Estate Taxes		\$ 2,430	acre	0.74%	\$ 17.86	\$
<b>Total Cost Including Overhead</b>					<b>\$ 492.72</b>	<b>\$</b>
<b>Cost per Bushel</b>					<b>\$ 5.19</b>	<b>\$</b>
<b>Cash Cost per Bushel</b>					<b>\$ 2.72</b>	<b>\$</b>
<b>Notes:</b> The broadleaf herbicide was the price and recommended rate of Carnivore. Soil test costs were based on a 70 acre field. The fertilizer blend used was 105-50-30. Merit 57 was the seed used, it was in the top two seed variety planted in Wyoming in 2017, Moravian 69 was first. Merit 57 is a Breiss product though and growers in Powell grow primarily for Breiss.						

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## IRRIGATED CORN FOR GRAIN, BIG HORN BASIN, WYOMING

This crop budget is a representative model of irrigated corn harvested for grain production in northwest Wyoming. The budget contains estimated costs for one year of corn production. Operation costs in the budget represent the best estimates from multiple sources in northwest Wyoming (Big Horn Co-op, personal communication, October 2019) (P. Kukowski, personal communication, October 2019), as well as University of Nebraska state crop budgets (Klein et al., 2019). University of Minnesota machinery cost estimates (Lazarus, 2019) were used to establish use-related and total costs.

Many different corn varieties are planted in nearly all irrigated acres in Wyoming. In the nation, 92 percent of the corn planted are biotech varieties (USDA-NASS, 2019a). Biotech varieties would include any type of insect resistance, such as *Bacillus thuringiensis* (Bt), or herbicide resistance, such as glyphosate resistant (GR) corn. Combining modified biotech seed with compatible herbicide and pesticide regimes is common in commercial U.S. corn production. Corn throughout this budget is assumed to be glyphosate resistant.

### Land

This budget assumes the land base is owned by the producer. Real estate opportunity cost is assumed to be 4 percent per acre of the land value. Real estate taxes are assumed to be 0.74 percent per acre which is based off of the 2019 mill levy assessed property tax rate in northwest Wyoming, no water tax is assumed for these budgets. The land value is estimated at \$2,430 per acre, this is the average value of irrigated cropland in Wyoming according to the most current United States Agricultural Statistics Service Survey, released August 2019 (USDA-NASS, 2019b).

### Labor

Labor in this budget is assumed to be provided by the landowner at the rate of \$20 per hour for all field operations except the custom trucking.

### Capital

Interest on operating capital is included at 6.5 percent. This is based on the Wall Street Journal Prime rate (WSJP) current rate of 5.0 percent and the assumption individual lenders will raise personal rates at least an additional 1.5 percent (“Farm Operating Loans: Farm Equity Line of Credit Loans”). This percentage is the rate at which the lending institution is charging the operation on loaned capital. Interest is charged on operating capital for cash expenses biannually. This percentage should be adjusted based on the individual producer’s situation.

### Field Operations

This enterprise budget is based on the assumed yield of 180 bushels per acre (Larson et al., 2001). This is an assumed average yield for irrigated corn in northwest Wyoming. Due to the variability in products and premiums, no crop insurance is assumed for this budget, and individual operations should adjust this assumption if they purchase crop insurance. Three fertilizer applications are included in this budget, a pre-plant dry formulation mix 110-50-40-14S, an emergent fertilizer applied at planting and a post-plant application of 32-0-0 liquid fertilizer delivered via fertigation. While gravity irrigation has been historically more prevalent in this area, center pivot irrigation is assumed in this budget as more crop-ground is expected to be converted to this irrigation type. Pivot costs are separated into use-related and ownership related. Cost per acre of ownership is assumed to be \$62.61/acre, while use related differs by acre-inch of water (USDA-NRCS, 2017).

Power costs and labor costs make up the use-related costs. Power sources for the motor vary between natural gas, single phase to three phase converted electricity and straight three phase electricity. (Other power sources such as diesel may be used, however it is not common in northwest Wyoming so it was excluded from our budget.) Averages from these three power sources gave us a cost of power per acre inch of water.

This budget assumes most tillage is done in the fall after the corn is harvested and Verdict is added as a spray down

Irrigated Corn for Grain, Northwest Wyoming, 2019						
Corn, Fall Field Work, 180 bushel/acre						
Pivot irrigated, ground water, 13 acre inches						
<b>Corn</b>						
<b>Field Operations</b>				<b>Use Related</b>	<b>Total</b>	<b>Your</b>
				<b>Cost/Acre</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
<b>Pre-Plant Fall</b>						
Deep Rip (Plow)				\$ 8.84	\$ 15.25	\$
Disc				\$ 8.50	\$ 12.40	\$
Roller Harrow				\$ 4.94	\$ 7.30	\$
Soil Tests				\$ 0.65	\$ 0.65	\$
<b>Pre-Plant Spring</b>						
Pre-Plant Spray				\$ 5.98	\$ 8.50	\$
Spread Fertilizer				\$ 3.12	\$ 5.24	\$
Field Cultivations				\$ 4.98	\$ 8.08	\$
<b>Plant</b>						
Plant Corn				\$ 10.45	\$ 16.18	\$
<b>Grow</b>						
Row Crop Cultivation				\$ 5.76	\$ 8.94	\$
Spray Herbicide Applications				\$ 3.00	\$ 5.00	\$
Pivot Irrigation				\$ 36.85	\$ 99.46	\$
<b>Harvest</b>						
Combine Corn				\$ 27.66	\$ 35.52	\$
Grain Cart				\$ 14.85	\$ 15.72	\$
Truck				Custom		\$
Chop Stalks				\$ 9.23	\$ 13.31	\$
<b>Total Field Operations</b>				<b>\$ 144.81</b>	<b>\$ 251.53</b>	
<b>Materials and Services</b>	<b>Type</b>	<b>Rate</b>	<b>Unit</b>	<b>Price</b>	<b>Total</b>	<b>Your</b>
				<b>Per Unit</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
<b>Pre-Plant</b>						
	46-0-0 Granular Fertilizer	110	lbs N	\$ 0.24	\$ 26.13	\$
	11-52-0 MAP Fertilizer	50	lbs P2O5	\$ 0.28	\$ 14.00	\$
	0-0-60 Fertilizer	40	lbs K2O	\$ 0.22	\$ 8.60	\$
	Ammonium Sulfate Fertilizer	14	lbs SO4	\$ 0.19	\$ 2.63	\$
	Verdict	14	ounce	\$ 2.09	\$ 29.20	\$
<b>At Plant</b>						
	VT Double PRO® RIB Complete®	36	k seed	\$ 3.00	\$ 108.00	\$
	Pop Up fertilizer	5	gal	\$ 4.20	\$ 21.00	\$
<b>Liquid Fertilizer</b>						
	32-0-0 Liquid Fertilizer	110	lbs N	\$ 0.21	\$ 22.83	\$
<b>Herbicide</b>						
	Glyphosate 41%	36	ounce	\$ 0.13	\$ 4.74	\$
	Dicamba	12	ounce	\$ 0.43	\$ 5.18	\$
	Surfactant	6	ounce	\$ 0.31	\$ 1.87	\$
<b>Harvest</b>						
	Haul Grain Bushels	180	bushel	\$ 0.20	\$ 36.00	\$
	Dry 2 Points Removed	180	bushel	\$ 0.07	\$ 12.60	\$
<b>Total Materials and Services</b>					<b>\$ 292.76</b>	<b>\$</b>
Total Listed Costs for Operations and Materials and Services					\$ 544.29	\$
Annual Interest on Operation Capital	Cash Related/Non-Ownership	6.50%		\$ 437.57	\$ 28.44	\$
<b>Total Operating and Use Related Ownership Costs</b>					<b>\$ 572.73</b>	<b>\$</b>
Overhead	Insurance, Vehicles, Office				\$ 20.00	\$
Real Estate Opportunity Cost	Wyoming Irrigated	\$ 2,430	acre	4.00%	\$ 97.20	\$
Real Estate Taxes		\$ 2,430	acre	0.74%	\$ 17.86	\$
<b>Total Cost Including Overhead</b>					<b>\$ 707.80</b>	<b>\$</b>
<b>Cost per Bushel</b>					<b>\$ 3.93</b>	<b>\$</b>
<b>Cash Cost per Bushel</b>					<b>\$ 2.59</b>	<b>\$</b>
<b>Notes:</b> Conventional corn is assumed to be glyphosate resistant; conventional is meant to be non-organic. This assumes most tillage is done in the fall after harvest, Verdict is added as a spray down herbicide before planting in the spring. If field work is done in the spring than Verdict is not necessary. Generic Glyphosate at 41% was used instead of commercial RoundUp. Soil test costs were based on a 70 acre field. For a goal of 180 bushel/acre corn the dry blend fertilizer was 110-50-14S, the other 110 units of nitrogen will come from 32-0-0 as fertigation. The total blend would then be 220-50-40-14S.						

herbicide before planting in the spring. If field work is completed in the spring, then Verdict is not necessary. Corn is planted in the spring and the budget assumes planting in 30-inch rows<sup>1</sup> with a conventional planter. Corn for grain is harvested in the fall, typically with a row crop head. Per acre use-related and total cost for implement, with associated power units, are averaged over all sizes by implement type in the field operation portion of the budget. Using this approach accounts for all possible tractor types and horsepower sizes.

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<sup>1</sup> 30-inch rows and a plant population of 36,000 plants/acre is common practice in Northwest Wyoming, there are producers who plant at 22-inch row spacing, however, in this research we assume 30-inch row spacing.



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## IRRIGATED SUGARBEET, BIG HORN BASIN, WYOMING

This crop budget is a representative model of sugarbeet production in northwest Wyoming. The budget contains estimated costs for one year of sugarbeet production. Operation costs in the budget represent the best estimates from multiple sources in northwest Wyoming (Big Horn Co-op, personal communication, October 2019) (P. Kukowski, personal communication, October 2019), as well as University of Nebraska state crop budgets (Klein et al., 2019), and University of Idaho regional crop budgets (Eborn, 2017). University of Minnesota machinery cost estimates (Lazarus, 2019) were used to establish use-related and total costs.

Sugarbeet is an irrigated crop in Wyoming. This budget refers to conventional sugarbeet which is to say, non-organic. Almost all of the sugarbeets planted in the state, and in the nation currently, are considered biotech species (Kniss, 2010). For sugarbeets, this means cultivars are glyphosate resistant (GR), that is, genetically engineered to be unaffected by glyphosate herbicides accordingly, the budget uses this commonly occurring seed and herbicide combination. In Wyoming, 33,100 acres of sugarbeet were reported in the March planting forecast for 2019 (USDA-NASS 2019b). Sugarbeet throughout this budget is assumed to be glyphosate resistant.

### Land

This budget is based on the assumption the land base is owned by the producer. Real estate opportunity cost is assumed to be 4 percent per acre of the land value. Real estate taxes are assumed to be 0.74 percent per acre based on the 2019 mill levy assessed property tax rate in northwest Wyoming, no water tax is figured in this budget. The land value is estimated to be \$2,430 per acre. This is the average value of irrigated cropland in Wyoming according to the most current United States Agricultural Statistics Service Survey, released August 2019 (USDA-NASS, 2019a).

### Labor

Labor in this budget is assumed to be provided by the landowner at the rate of \$20 per hour for all field operations except the custom trucking.

### Capital

Interest on operating capital is included at 6.5 percent. This is based on the Wall Street Journal Prime Rate (WSJP) current rate of 5.0 percent and the assumption individual lenders will raise percentage rates at least an additional 1.5 percent (“Farm Operating Loans: Farm Equity Line of Credit Loans”). This percentage is the rate which the lending institution charges the operation on loaned capital. Interest is charged on operating capital for cash expenses biannually. This percentage should be adjusted based on the individual producer’s situation.

### Field Operations

This enterprise budget is based on the assumed yield of 29 ton per acre (USDA-NASS, 2018). This is an average yield for irrigated sugarbeet in northwest Wyoming. Due to the variability in products and premiums, no crop insurance is assumed for this budget, and individual operations should adjust this assumption if they purchase crop insurance. Three fertilizer applications are included in this budget, a pre-plant dry formulation mix, 115-80-10-36S, an emergent fertilizer applied at planting and a post-plant application of 32-0-0 liquid fertilizer delivered via fertigation. The spraying protocol for the sugarbeet is three applications of glyphosate and one application of both a grass herbicide, and a fungicide. While gravity irrigation has been historically more prevalent in this area, center pivot irrigation is assumed in this budget as more crop-ground is expected to be converted to this irrigation type. Pivot costs are separated into use-related and ownership related. Cost per acre of ownership is assumed to be \$62.61/acre, while use related differs by acre-inch of water (USDA-NRCS, 2017). Power costs and labor costs make up the use-related costs. Power sources for the motor vary between natural gas, single phase to three phase converted electricity and straight three phase electricity. (Other power sources such as diesel may be used, however it is not common in northwest Wyoming so it was excluded from our budget.) Averages from these three power sources yielded a cost of power per acre inch of water.

Sugarbeets are planted in May with a 12-row planter on 22-inch rows. The beets are topped and harvested in

Irrigated Sugarbeet, Northwest Wyoming, 2019						
Sugarbeet, Spring Field Work, 29 ton/acre, 18% sugar						
Pivot irrigated, ground water, 16 acre inches						
<b>Sugarbeet</b>						
<b>Field Operations</b>				<b>Use Related</b>	<b>Total</b>	<b>Your</b>
				<b>Cost/Acre</b>	<b>Cost/Acre</b>	<b>Cost/Acre</b>
<b>Pre-Plant Fall</b>						
Soil Tests				\$ 0.65	\$ 0.65	\$
<b>Pre-Plant Spring</b>						
Spread Fertilizer				\$ 3.12	\$ 5.24	\$
Field Cultivations				\$ 4.98	\$ 8.08	\$
Deep Rip (Plow)				\$ 8.84	\$ 15.25	\$
Disc				\$ 8.50	\$ 12.40	\$
Roller Harrow				\$ 4.94	\$ 7.30	\$
<b>Plant</b>						
Plant Sugarbeet				\$ 7.25	\$ 14.12	\$
<b>Grow</b>						
Row Crop Cultivation				\$ 5.76	\$ 8.94	\$
Spray Herbicide Applications				\$ 3.00	\$ 5.00	\$
Pivot Irrigation				\$ 46.56	\$ 109.17	\$
<b>Harvest</b>						
Top Sugarbeet				\$ 12.88	\$ 21.46	\$
Sugarbeet Harvester, 6 row				\$ 21.00	\$ 33.50	\$
Truck				Custom		\$
<b>Total Field Operations</b>				<b>\$ 127.49</b>	<b>\$ 241.10</b>	<b>\$</b>
<b>Materials and Services</b>	<b>Type</b>	<b>Rate</b>	<b>Unit</b>	<b>Price Per Unit</b>	<b>Total Cost/Acre</b>	<b>Your Cost/Acre</b>
Pre-Plant	46-0-0 Granular Fertilizer	115	lbs N	\$ 0.24	\$ 27.31	\$
	11-52-0 MAP Fertilizer	80	lbs P2O5	\$ 0.28	\$ 22.40	\$
	0-0-60 Fertilizer	10	lbs K2O	\$ 0.22	\$ 2.15	\$
	Ammonium Sulfate Fertilizer	36	lbs S	\$ 0.19	\$ 6.75	\$
At Plant	Sugarbeet RR Betashield Plus	1	box	\$ 200.00	\$ 200.00	\$
	Pop up Fertilizer	3	Gal	\$ 4.20	\$ 12.60	\$
Liquid Fertilizer	32-0-0 Liquid Fertilizer	115	lbs N	\$ 0.21	\$ 23.86	\$
Custom Herbicide	Glyphosate 41% (3 applications)	36	oz	\$ 0.13	\$ 14.23	\$
	Grass Herbicide (1 application)	6	oz	\$ 0.81	\$ 4.87	\$
	Fungicide (1 application)	6	oz	\$ 4.61	\$ 27.63	\$
	Surfactant (3 applications)	6	oz	\$ 0.31	\$ 5.60	\$
Harvest	Haul Sugarbeet	29	ton	\$ 5.00	\$ 145.00	\$
<b>Total Materials and Services</b>					<b>\$ 492.40</b>	<b>\$</b>
Total Listed Costs for Operations, and Materials and Services					\$ 733.49	\$
Annual Interest on Operation Capital	Cash Related/non-Ownership	6.50%		\$ 619.88	\$ 40.29	\$
<b>Total Operations and Materials and Services</b>					<b>\$ 773.79</b>	<b>\$</b>
Overhead	Insurance, Vehicles, Office				\$ 20.00	\$
Real Estate Opportunity Cost	Wyoming Irrigated	\$ 2,430	acre	4.00%	\$ 97.20	\$
Real Estate Taxes		\$ 2,430	acre	0.74%	\$ 17.86	\$
<b>Total Cost Including Overhead</b>					<b>\$ 908.85</b>	<b>\$</b>
<b>Cost per Ton</b>					<b>\$ 31.34</b>	<b>\$</b>
<b>Cash Cost per Ton</b>					<b>\$ 22.76</b>	<b>\$</b>
<b>Notes:</b> My application protocol is; App #1: Glyphosate + Grass Herbicide + Surfactant, App #2: Glyphosate + Surfactant, App #3: Glyphosate + Fungicide + Surfactant. My rate recommendations are per application so they are multiplied by number of applications to find the total amount sprayed. Generic Glyphosate at 41% was used instead of RoundUp. The fertilizer was a dry blend 115-80-10-36S and 115 more units of nitrogen were fertiligated on with 32-0-0 later. Soil test costs are based on a 70 acre field.						

September through October. Per acre use-related and total cost for implement, with associated power units, are averaged over all sizes by implement type in the field operation portion of the budget. Using this approach accounts for all possible tractor types and horsepower sizes.

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