



2015 Saskatchewan

Irrigation Economics and Agronomics

Disclaimer

The authors of Irrigation Economics and Agronomics attempt to provide accurate and useful information. Average and target yields were determined by surveying producers from the Lake Diefenbaker Development Area of Saskatchewan. Fertility requirements are based on the yield targets used. Actual yields achieved are affected by seasonal growing conditions and individual management skills.

The prices used for crops and inputs are based on discussions with grain marketing companies and farm supply retailers, and are only accurate at the time of printing. Therefore, the authors and the Irrigation Crop Diversification Corporation assume no responsibility for any actions taken by any reader of this publication based on the information provided.

Electronic Version at www.irrigationsaskatchewan.com

An electronic version of the economic worksheets is available online at www.irrigationsaskatchewan.com. Simply input your farm specifics into the Excel worksheet, and your returns are automatically calculated.

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Irrigation Crop Budget Assumptions

Projected crop prices and input costs for 2015 are estimates based on the information available as of January 2015. Readers are advised to use the latest available input costs and crop prices to calculate their returns.

Seed costs are from industry sources. Varieties are selected from the “Crop Variety Guide for Irrigation” based on the most suitable for irrigation. Refer to Appendix A for more details.

Seed treatment and inoculant costs are based on retail prices for 2015. For budgeting purposes, in this publication cereals are treated with Cruiser MAXX Vibrance™, pulses with Cruiser Maxx Pulse™. The canola, soy bean, and corn seed price includes seed treatment.

Fertilizer recommendations are based on the assumption that the nutrients available in a 0–12" soil sample are: 30 lb/ac N, 20 lb/ac P, and > 800 lb/ac K. An actual soil test is required to provide recommendations for fertilizer applications based on soil nutrient levels and crop needs for each field.

Fertilizer prices are retail prices as of January 2015:

- Nitrogen based on 46-0-0 at \$590/tonne (\$0.58/lb)
- Nitrogen based on 28-0-0 at \$400/tonne (\$0.65/lb)
- Phosphorus based on 11-52-0 at \$760/tonne (\$0.60/lb)
- Potassium based on 0-0-62 at \$535/tonne (\$0.39/lb)

The water from the South Saskatchewan River (Lake Diefenbaker) supplies about 5 lbs of sulphur per inch of irrigation. Addition of sulfur may be required for high sulfur demanding crops such as canola and alfalfa, but producers should base addition of sulfur on soil test results.

Herbicide, insecticide, and fungicide costs are based on retail prices for 2015. The products chosen are based on best management practice and are examples only. Refer to Appendix A for more details on product examples.

Equipment repair costs are based on Saskatchewan Ministry of Agriculture Crop Planning Guides for 2014. Equipment fuel and repair for other crops is estimated based on producer experience. Fuel is based on a cost of \$0.92/L for diesel, including delivery.

Custom work and hired labour are based on the Crop Planning Guide 2014 (\$21 hour).

Irrigation application rates are based on the 10 year average seasonal rainfall of 10.7 inches at Outlook, Saskatchewan and the measured seasonal crop water use.

Irrigation power costs for pumping are based on a 40 hp pump and a 7 tower low pressure pivot, with an annual cost being approximately \$1,860 for 133 acres.

Irrigation repair cost is based on 1.5% of \$100,000 (pivot, pump, and mainline cost) over 133 acres.

Irrigation service charge based on the 2014 per acre rate for SSRID (base \$25.39; pressure charge \$3 with a water usage adjustment; \$3.75 for 12 inches).

Be aware: district charges vary depending on delivery system.

Crop insurance rates are based on the 2014 rates at 70% for soil class J in Risk Area 16. See Generic Insurance Cost Calculator at www.saskcropinsurance.com for 2014 rates released in March.

Hail insurance rates are based on \$150.00/ac coverage at 5.2% premium for crops insured at the basic rate, 1.75X for canola, and 2.00X for pulse crops.

Other is for expenses not covered above. Refer to Appendix A for more details.

Farm overhead costs include property taxes, auto expenses, building repairs, insurance, and small tools.

Operating interest is 4.2% for 6 months (consistent with Saskatchewan Ministry of Agriculture Crop Planning Guide 2014).

Farm equipment and buildings annual cost is based on 5.5% annual interest being charged against the value of the assets of a sample farm.

Irrigation system cost is equal to a payment at 5.5% interest based on a system value of \$50,000 (50% of new cost \$100,000) irrigating 133 acres.

Special Crop Equipment

- Row crop equipment costs used in the dry bean and corn budgets (planter, cultivator, etc.) is based on 600 acres of use annually for 10 years.
- Grain corn header use cost is based on 300 acres of use annually for 10 years.
- Side knife use cost is based on 300 acres of use annually for 10 years.
- Flex-header and land roller (peas, lentils, and soy beans) use cost is based on 600 acres of use annually for 10 years.
- Hay equipment: baler, mower/conditioner, and swath inverter costs are based on 500 acres of use annually for 10 years, bale mover for 15 years.
- Potato field equipment (10 year life), storage/handling equipment (10 year life), and storage facility (15 year life) costs are based on 500 acres.

Land investment cost is calculated at a 4.5 per cent return on investment of \$1,250 per cultivated acre.

Most grain prices provided from an online app for August/September delivery to Moose Jaw, Saskatchewan as of January 2015. Moose Jaw was chosen as it is a central location and prices for several crops were available. Grain corn and soy bean price is for August/September delivery to Weyburn. Other crop prices were provided by industry.

Target yields reflect yields that can be obtained under ideal growing conditions using the agronomic practices and levels of inputs as stated in the budget.

Average yields reflect what experienced irrigators tell us they are achieving on a regular basis.

Average and target yields are based on producer experience. Variations can occur due to environmental conditions, management, and soil productivity.

Break Even Yield is calculated using total cost divided by the price (\$/bu).

Break Even Price is calculated using total cost divided by the target yield (bu/ac).

Variety Selection — irrigators may wish to consult *Crop Varieties for Irrigation*, which Irrigation Crop Diversification Corporation updates annually.

CROP: Hard Wheat

ECONOMICS

Item	Unit	\$/ac	My Farm \$/ac
Seed		\$30.80	
Seed treatment		\$8.71	
Soil test		\$1.00	
Fertilizer: N	135 lb	\$78.56	
P ₂ O ₅	45 lb	\$26.96	
K ₂ O	0 lb	\$0.00	
Herbicide		\$33.38	
Insecticide *		\$0.00	
Fungicide		\$18.50	
Equipment fuel		\$16.42	
Equipment repair		\$6.22	
Custom work		\$0.00	
Irrigation power	3.5 inches	\$7.00	
Irrigation repair		\$11.28	
Irrigation service/water charge		\$26.41	
Crop insurance	53 bu/ac	\$3.35	
Hail insurance		\$7.80	
Hired labour	0 hr/ac	\$0.00	
Other		\$0.00	
Farm overhead		\$9.20	
Operating interest	4.2 %	\$6.00	
Total Cash Costs		\$291.59	
Farm Equipment & Buildings		\$65.79	
Irrigation System		\$28.03	
Specialized Equipment		\$0.00	
Land		\$56.25	
Total Non-Cash Costs		\$150.07	
Total Costs		\$441.66	
Returns	AVG	Target	
Yield bu/ac	70	80	
Price \$/bu (#1 13.5%)		\$5.90	
Gross Return	\$413	\$472	
Net Return	-\$29	\$30	
Specialized Equipment		\$/ac/yr	
TOTAL		\$0.00	
Break Even using Target Returns & Total Costs			
Break Even Price	\$/ac	\$5.52	
Break Even Yield	bu/ac	75	

AGRONOMICS

Variety Selection:

Vesper VB, Unity, and CDC Utmost are wheat midge tolerant varieties. Vesper VB, 5604HR CL, and CDC Kernen are high yielding varieties. Carberry is resistant to fusarium head blight. Select an irrigated variety on the basis of high yield, lodging resistance, and disease resistance. See ICDCs **Crop Varieties for Irrigation**.

Seeding:

Plant population 250.0 plants/sq m.
TKW 42.0 grams
Seeding Rate 110.0 lb/ac

Seed before May 15th.

Fertilization:

Apply 120–135 lb/ac N and 30–45 lb/ac P₂O₅.
A soil test will provide a recommendation for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 300–400 mm; avg. 337 mm ☼
- Emergence to Tillering: 1.0 to 4.5 mm/day
- Stem Extension to Heading: 3.5 increasing to 6.5 mm/day
- Flowering to Late Milk: 5.5 to 7.5 mm/day
- Early Dough to Maturity: 6.5 decreasing to 2 mm/day

Critical stages for moisture are tillering and flowering. Maintain soil at > 50% available moisture. Use a soil probe to check moisture status. † Allow the canopy to dry between irrigations to minimize disease pressure and lodging.

Harvest:

Swath or desiccate at a kernel moisture content of 30%. The kernel will dent with pressure. In some years the straw may still be green. Decide on the basis of grain firmness and colour.

Handling, Storage, and Grading:

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection:

Fungicide seed treatment recommended. Wheat on wheat stubble will yield at least 15% less (due to disease build-up) than wheat on broadleaf stubble. Break from cereals for one year. Fusarium head blight is a concern on irrigation. Hard wheat is less susceptible than durum, but a fungicide application is recommended for control.

* Wheat midge may require control.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Durum

ECONOMICS

Item	UNIT			\$/ac	My Farm \$/ac
Seed				\$42.00	
Seed treatment				\$9.52	
Soil test				\$1.00	
Fertilizer:	N	165	lb	\$96.02	
	P ₂ O ₅	40	lb	\$23.96	
	K ₂ O	0	lb	\$0.00	
Herbicide				\$33.38	
Insecticide *				\$0.00	
Fungicide				\$18.50	
Equipment fuel				\$16.42	
Equipment repair				\$6.22	
Custom work				\$0.00	
Irrigation power	3.5	inches		\$7.00	
Irrigation repair				\$11.28	
Irrigation service/water charge				\$26.41	
Crop insurance	64	bu/ac		\$5.56	
Hail insurance				\$7.80	
Hired labour	0	hr/ac		\$0.00	
Other				\$0.00	
Farm overhead				\$9.20	
Operating interest	4.2	%		\$6.60	
Total Cash Costs				\$320.88	
Farm Equipment & Buildings				\$65.79	
Irrigation System				\$28.03	
Specialized Equipment				\$0.00	
Land				\$56.25	
Total Non Cash Costs				\$150.07	
Total Costs				\$470.95	
Returns	AVG	Target			
Yield bu/ac	80	90			
Price \$/bu (#1 13.5%)				\$8.00	
Gross Return	\$640	\$720			
Net Return	\$169	\$249			
Specialized Equipment				\$/ac/yr	
TOTAL				\$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price		\$/ac		\$5.23	
Break Even Yield		bu/ac		59	

AGRONOMICS

Variety Selection:

Strongfield and Brigade are high-yielding varieties with good lodging resistance. Durum varieties require more days to mature than other wheats. See ICDCs *Crop Varieties for Irrigation*.

Seeding:

Plant population	250.0	plants/sq m.
TKW	45.0	grams
Seeding Rate	120.0	lb/ac

Seed before May 15th

Fertilization:

Durum can be downgraded due to piebald kernels. Sufficient N reduces the problem. Apply 140–165 lb/ac N and 30–40 lb/ac P₂O₅. A soil test will provide a recommendation for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 300–400 mm; avg. 337 mm ☼
- Emergence to Tillering: 1.0 to 4.5 mm/day
- Stem Extension to Heading: 3.5 increasing to 6.5 mm/day
- Flowering to Late Milk: 5.5 to 7.5 mm/day
- Early Dough to Maturity: 6.5 decreasing to 2 mm/day

Critical stages for moisture are tillering and flowering. Maintain soil at > 50% available moisture. Use a soil probe to check moisture status.† Allow the canopy to dry between irrigations to minimize disease pressure and lodging.

Harvest:

Swath or desiccate at a kernel moisture content of 30%. The kernel will dent with pressure. In some years the straw may still be green. Decide on the basis of grain firmness and colour. Durum is more susceptible to weathering and sprouting than hard wheat.

Handling, Storage, and Grading:

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection:

Fungicide seed treatment recommended. Durum is more susceptible to fusarium head blight than other wheat classes. A four year break between durum crops reduces risk and build-up of disease. Avoid planting durum on or near corn stubble. Wheat on wheat stubble will yield at least 15% less (due to disease build-up) than wheat on broadleaf stubble. A fungicide application is recommended. Break from cereals for one year.

* Wheat midge may require control.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

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CROP: CPS Wheat

ECONOMICS

ITEM	UNIT			\$/ac	My Farm \$/ac
Seed				\$23.10	
Seed treatment				\$8.71	
Soil test				\$1.00	
Fertilizer:	N	90	lb	\$52.38	
	P ₂ O ₅	30	lb	\$17.97	
	K ₂ O	15	lb	\$5.87	
Herbicide				\$33.38	
Insecticide *				\$0.00	
Fungicide				\$18.50	
Equipment fuel				\$16.42	
Equipment repair				\$6.22	
Custom work				\$0.00	
Irrigation power	3.5	inches		\$7.00	
Irrigation repair				\$11.28	
Irrigation service/water charge				\$26.41	
Crop insurance	57	bu/ac		\$5.35	
Hail insurance				\$7.80	
Hired labour	0	hr/ac		\$0.00	
Other				\$0.00	
Farm overhead				\$9.20	
Operating int	4.2	%		\$5.26	
Total Cash Costs				\$255.85	
Farm equipment & buildings				\$65.79	
Irrigation system				\$28.03	
Specialized equipment				\$0.00	
Land				\$56.25	
Total Non-Cash Costs				\$150.07	
Total Costs				\$405.92	
Returns	AVG	Target			
Target yield bu/ac	75	80			
Price \$/bu (#1 CPSR)				\$4.66	
Gross	\$350	\$373			
Net Return	-\$56	-\$33			
Specialized Equipment				\$/ac/yr	
TOTAL				\$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price	\$/ac			\$5.07	
Break Even Yield	bu/ac			87	

AGRONOMICS

Variety Selection:

Conquer is the only high yielding CPS midge tolerant variety. Select an irrigated variety on the basis of high yield, lodging resistance, and disease resistance. See ICDCs *Crop Varieties for Irrigation*.

Seeding:

Plant population	250.0	plants/sq m.
TKW	42.0	grams
Seeding Rate	110.0	lb/ac

Seed before May 15th.

Fertilization:

Apply 80–90 lb/ac N, 25–20 lb/ac P₂O₅, and 10–15 lb/ac K₂O.

A soil test will provide recommendations for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 300–400 mm; avg. 337 mm ☼
- Emergence to Tillering: 1.0 to 4.5 mm/day
- Stem Extension to Heading: 3.5 increasing to 6.5 mm/day
- Flowering to Late Milk: 5.5 to 7.5 mm/day
- Early Dough to Maturity: 6.5 decreasing to 2 mm/day

Critical stages for moisture are tillering and flowering. Maintain soil at > 50% available moisture. Use a soil probe to check moisture status.† Allow the canopy to dry between irrigations to minimize disease pressure and lodging.

Harvest:

Swath or desiccate at a kernel moisture content of 30%. The kernel will dent with pressure. In some years the straw may still be green. Decide on the basis of grain firmness and colour. CPS is more susceptible to weathering and sprouting than hard wheat.

Handling, Storage, and Grading:

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection:

Fungicide seed treatment is recommended. Wheat on wheat stubble will yield at least 15% less than wheat on broadleaf stubble due to disease build-up. Break from cereals for one year. CPS is less susceptible to fusarium head blight than durum. A fungicide application is recommended.

* Wheat midge may require control.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

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CROP: Soft Wheat

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$25.30	
Seed treatment			\$8.71	
Soil test			\$1.00	
Fertilizer: N	140	lb	\$81.47	
P ₂ O ₅	40	lb	\$23.96	
K ₂ O	15	lb	\$5.87	
Herbicide			\$33.38	
Insecticide *			\$0.00	
Fungicide			\$18.50	
Equipment fuel			\$16.42	
Equipment repair			\$6.22	
Custom work			\$0.00	
Irrigation power	3.5	inches	\$7.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.41	
Crop insurance	55	bu/ac	\$3.48	
Hail insurance			\$7.80	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating Interest	4.2	%	\$6.01	
Total Cash Costs			\$292.02	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$0.00	
Land			\$56.25	
Total Non-Cash Costs			\$150.07	
Total Costs			\$442.09	
Returns	AVG	Target		
Yield bu/ac	90	100		
Price \$/bu (#1 CWSWS)			\$4.23	
Gross	\$381	\$423		
Net Return	-\$61	-\$19		
Specialized Equipment			\$/ac/yr	
TOTAL			\$0.00	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$4.42	
Break Even Yield		bu/ac	105	

AGRONOMICS

Variety Selection:

Sadash and AC Andrew are high yielding varieties with a good lodging rating. See ICDCs **Crop Varieties for Irrigation**.

Seeding:

Plant population	250.0	plants/sq m.
TKW	39.0	grams
Seeding Rate	110.0	lb/ac

Seed before May 15th.

Fertilization:

Low protein soft wheat production requires a balance between water and nitrogen. Apply 130–140 lb/ac N, 30–40 lb/ac P₂O₅ and 10–15 lb/ac K₂O. A soil test will provide recommendations for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 300–400 mm; avg. 337 mm ☼
- Emergence to Tillering: 1.0 to 4.5 mm/day
- Stem Extension to Heading: 3.5 increasing to 6.5 mm/day
- Flowering to Late Milk: 5.5 to 7.5 mm/day
- Early Dough to Maturity: 6.5 decreasing to 2 mm/day

Critical stages for moisture are at tillering and flowering. Maintain soil at > 50% available moisture. Allow the canopy to dry between irrigations to minimize disease pressure and lodging. Use a soil probe to check moisture status.†

Harvest:

Swath or desiccate at a kernel moisture content of 30%. The kernel will dent with pressure. In some years the straw may still be green. Decide on the basis of grain firmness & colour. Soft wheat is more susceptible to weathering and sprouting than hard wheat.

Handling, Storage, and Grading:

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection:

Fungicide seed treatment is recommended. Wheat on wheat stubble will yield at least 15% less (due to disease build-up) than wheat on broadleaf stubble. Break from cereals for one year. Soft wheat is more susceptible to fusarium head blight than hard wheat, but less susceptible than durum. A fungicide application is recommended. Avoid planting soft wheat on or near corn stubble.

* Wheat midge may require control.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

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CROP: Malt Barley

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$22.00	
Seed treatment			\$8.76	
Soil test			\$1.00	
Fertilizer: N	85	lb	\$49.47	
P ₂ O ₅	30	lb	\$17.97	
K ₂ O	15	lb	\$5.87	
Herbicide			\$23.95	
Insecticide			\$0.00	
Fungicide			\$7.70	
Equipment fuel			\$16.42	
Equipment repair			\$6.22	
Custom work			\$0.00	
Irrigation power	2.0	inches	\$4.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$25.97	
Crop insurance	70	bu/ac	\$4.41	
Hail insurance			\$7.80	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$4.66	
Total Cash Costs			\$226.69	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$0.00	
Land			\$56.25	
Total Non-Cash Costs			\$150.07	
Total Costs			\$376.76	
Returns	AVG	Target		
Yield bu/ac	100	120		
Price \$/bu (2-row select)		\$5.85		
Gross	\$585	\$702		
Net Return	\$208	\$325		
Specialized Equipment		\$/ac/yr		
TOTAL		\$0.00		
Break Even using Target Returns & Total Costs				
Break Even Price	\$/ac	\$3.14		
Break Even Yield	bu/ac	64		

AGRONOMICS

Variety Selection:

CDC Copeland and Newdale are 2-row varieties with good lodging resistance and high yield. Six-row Legacy has good lodging ratings and high yield. Two-row varieties are more likely to be selected, but six row varieties will resist disease better in the humid irrigated crop. See "Crop Varieties for Irrigation" publication and variety recommendations of Canadian Malting Barley Technical Centre.

Seeding:

Plant population 270.0 plants/sq m
TKW 41.0 grams
Seeding Rate 110.0 lb/ac

Seed before May 15th.

Fertilization:

Apply 80–90 lb/ac N, 25–30 lb/ac P₂O₅, and 15–20 lb/ac K₂O. A soil test will provide field specific recommendations for fertilizer application based on soil nutrient levels and crop needs. Consider potassium and zinc status especially on eroded soils.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 250–350 mm; avg. 271 mm ☼
- Tillering: 1 to 3 mm/day
- Flag Leaf to Flowering: 7 to 8 mm/day

Critical stages for moisture are tillering and flowering. Maintain soil at > 50% available moisture from tillering to flowering. Check moisture status with soil probe.† Build soil moisture prior to grain fill and draw down reserve through maturation to reduce stain and lodging.

Harvest:

Swath at maturity to avoid green kernels in the sample. Delay swathing until kernel is difficult to dent with thumbnail. Barley is more susceptible to weathering and sprouting than hard wheat.

Handling, Storage, and Grading:

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection:

Barley is less susceptible to fusarium head blight than wheat and durum, but varieties differ in susceptibility. Net blotch is an important disease of barley, reducing yield and causing downgrading (black point). Reduce net blotch severity by variety selection, burying residue, applying fungicide, and leaving two years between barley crops.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Feed Barley

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$18.20	
Seed treatment			\$8.76	
Soil test			\$1.00	
Fertilizer:	N 100	lb	\$58.19	
	P ₂ O ₅ 30	lb	\$17.97	
	K ₂ O 15	lb	\$5.87	
Herbicide			\$23.95	
Insecticide			\$0.00	
Fungicide			\$7.70	
Equipment fuel			\$16.42	
Equipment repair			\$6.22	
Custom work			\$0.00	
Irrigation power	2.0	inches	\$4.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$25.97	
Crop insurance	70	bu/ac	\$4.41	
Hail insurance			\$7.80	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$4.77	
Total Cash Costs			\$231.72	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$0.00	
Land			\$56.25	
Total Non-Cash Costs			\$150.07	
Total Costs			\$381.79	
Returns	AVG	Target		
Yield bu/ac	110	130		
Price \$/bu (1 CW)			\$3.24	
Gross	\$356	\$421		
Net Return	-\$25	\$39		
Specialized equipment			\$/ac/yr	
TOTAL			\$0.00	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$2.94	
Break Even Yield		bu/ac	118	

AGRONOMICS

Variety Selection:

Alston (6-row) has good lodging resistance and high yield. Champion and CDC Austenson are 2-row varieties with good lodging resistance. Choose a variety on the basis of yield, lodging and resistance to diseases. See ICDCs *Crop Varieties for Irrigation*.

Seeding:

Plant population 320.0 plants/sq m.
TKW 41.0 grams
Seeding Rate 130.0 lb/ac
Seed before May 15th

Fertilization:

Apply 95–105 lb/ac N, 25–30 lb/ac P₂O₅, and 15–20 lb/ac K₂O. A soil test will provide field specific recommendations for fertilizer application based on soil nutrient levels and crop needs. Consider potassium and zinc status on eroded soils.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 250–350 mm; avg. 271 mm ☼
 - Tillering: 3 to 6 mm/day
 - Flag Leaf to Milk: 5.5 to 7.5 mm/day
- Critical stages for moisture are at tillering and flowering. Allow the canopy to dry between irrigations to minimize disease pressure and lodging. Maintain soil at > 50% available moisture for tillering through flowering. Use a soil probe to check moisture status.† Irrigation applications should end at the soft dough stage.

Harvest:

Delay swathing until barley kernel is difficult to dent with thumb nail. Barley is more susceptible to weathering and sprouting than hard wheat.

Handling, Storage, and Grading:

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection:

Barley is less susceptible to fusarium head blight than most other cereal types, but varieties differ in susceptibility. Reduce net blotch severity with variety selection, burying residue, leaving two years between barley crops, and fungicide application. Smuts reduces suitability of feed barley.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Milling Oats

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$19.20	
Seed treatment			\$13.44	
Soil Sample			\$1.00	
Fertilizer:	N 50	lb	\$29.10	
	P ₂ O ₅ 20	lb	\$11.98	
	K ₂ O 0	lb	\$0.00	
Herbicide			\$21.38	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$16.42	
Equipment repair			\$6.22	
Custom work			\$0.00	
Irrigation power	2.0	inches	\$4.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$25.97	
Crop insurance	68	bu/ac	\$7.50	
Hail insurance			\$7.80	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$3.87	
Total Cash Costs			\$188.37	
Farm Equipment & Buildings			\$65.79	
Irrigation System			\$28.03	
Specialized Equipment			\$0.00	
Land			\$56.25	
Total Non-Cash Costs			\$150.07	
Total Costs			\$338.44	
Returns	AVG	Target		
Yield bu/ac*	120	150		
Price \$/bu		\$2.45		
Gross	\$294	\$368		
Net Return	-\$44	\$29		
Specialized Equipment		\$/ac/yr		
TOTAL			\$0.00	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$2.26	
Break Even Yield		bu/ac	138	

AGRONOMICS

Variety Selection:

Milling oats must have a high bushel weight (at least 42 lb/bu) to be accepted for this market.

Oat varieties have not been evaluated in irrigated trials. Choose an oat variety based on lodging resistance, maturity, and yield. CDC Minstrel and Morgan have good lodging ratings, % plump, grain weight, and yield and are suitable for milling. Check with the buyer on variety preferences.

Seeding:

Plant population	300.0 plants/sq m.
TKW	41.0 grams
Seeding Rate	120.0 lb/ac

Early planting consistently produces oat crops with higher yield and kernel weight than late planting. Plant by May 15th. Calculate seeding rate to reach a target plant population.

Fertilization:

Irrigated oat fertility recommendations have not been established, but oats do not respond strongly to nitrogen and are prone to lodging with increased nitrogen rates. Oats perform well on terminated alfalfa stubble with minimal fertilization.

Crop Water Use and Irrigation:

Irrigation scheduling and recommendation have not yet been developed for Saskatchewan. However, oats are known to respond well to additional moisture with high yields.

Harvest:

Swath when grain moisture is between 20% and 35%. Adjust combine to minimize dehulling of oats. If the crop is ripening evenly (35% moisture) in mid-August, consider straight combining.

Handling, Storage, and Grading:

Store below 13.5% moisture. Do not dry milling oats over 60°C.

Rotations and Crop Protection:

Wild oat control is essential. There are no registered herbicides to control volunteer cereals in oats, but seeding rate will effectively compete with wild oats. Check recropping restrictions on residual wild oat herbicides. Oat is less susceptible to fusarium head blight than most cereals.

* Yield and price per bushel are based on a 34 lb/bu standard weight for oats. Millers require bushel weights of at least 42 lb/bu.

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com. Refer to Prairie Oat Growers: www.poga.ca.

CROP: Canola

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$63.00	
Seed treatment			\$0.00	
Soil test			\$1.00	
Fertilizer:	N	160 lb	\$93.11	
	P ₂ O ₅	40 lb	\$23.96	
	K ₂ O	0 lb	\$0.00	
Herbicide			\$24.29	
Insecticide *			\$5.73	
Fungicide			\$21.95	
Equipment fuel			\$17.39	
Equipment repair			\$6.22	
Custom work			\$0.00	
Irrigation power	4.5	inches	\$9.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.70	
Crop insurance	46	bu/ac	\$8.33	
Hail insurance			\$13.65	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$7.03	
Total Cash Costs			\$341.85	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$0.33	
Land			\$56.25	
Total Non-Cash Costs			\$150.40	
Total Costs			\$492.25	
Returns	AVG	Target		
Yield bu/ac	55	70		
Price \$/bu		9.14		
Gross	\$503	\$640		
Net Return	\$10	\$148		
Specialized Equipment			\$/ac/yr	
Sideknife			\$0.33	
TOTAL			\$0.33	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$7.03	
Break Even Yield		bu/ac	54	

AGRONOMICS

Variety Selection:

Select a canola variety that is resistant to blackleg and resistant to lodging. Refer to the publication "Crop Varieties for Irrigation" for production data specific to irrigation in Saskatchewan.

Seeding:

Plant population 110.0 plants/sq m.
TKW Hybrid Canola 5.0 grams
Seeding Rate 6.0 lb/ac
Seed before May 15th.

Fertilization:

Apply 145–160 lb/ac N and 30–40 lb/ac P₂O₅. A soil test is recommended for fertilizer application based on soil nutrient levels and crop needs. Sulphate fertilization may be required depending on soil test recommendations.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 350–450 mm; avg. 372 mm ☼
- Vegetative: 1.5–3.0 mm/day
- Flowering: 7.5 mm/day maximum
- 30 day average peak use: 6.0–6.5 mm/day

Critical irrigation period extends from the late vegetative stage through flowering to initial seed ripening.

The active root zone of canola is 1.0 metre. Maintain the soil water content at or above 50% field capacity.†

Harvest:

Swath when 60% of seeds in pods on the main stem have changed colour. Green seed is caused by early swathing or extreme heat or cold while the crop is in the swath. Irrigated canola can be a challenge to swath.

Handling, Storage, and Grading:

Dry < 10%; Tough 10.1%; Damp 12.5%

Rotations and Crop Protection:

Canola should be grown in a four year rotation to control disease. A fungicide application is recommended for sclerotinia control. Recommended application timing is dependent upon product used, but should occur at 20–50% bloom (prior to petal drop). Scout fields weekly during growing season, checking for insects and diseases. An application of insecticide may be required to control flea beetles or bertha armyworm.

* An insecticide application may be required for Flea beetle, Bertha Armyworm or Diamondback Moth control.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com. Use the **Canola Growers Manual** from the Canola Council of Canada.

CROP: Soy Bean

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$92.00	
Seed treatment			\$0.00	
Soil Test			\$1.00	
Fertilizer:	N	0	lb	\$0.00
	P ₂ O ₅	20	lb	\$11.98
	K ₂ O	0	lb	\$0.00
Herbicide			\$24.07	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$18.35	
Equipment repair			\$10.81	
Custom work			\$0.00	
Irrigation power	2.5	inches	\$5.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.12	
Crop insurance	18	bu	\$10.74	
Hail insurance	7.2	%	\$15.60	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$4.96	
Total Cash Costs			\$241.11	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$8.55	
Land			\$56.25	
Total Non-Cash Costs			\$158.62	
Total Costs			\$399.74	
Returns	AVG	Target		
Yield bu/ac	30	40		
Price \$/bu			\$7.55	
Gross	\$227	\$302		
Net Return	-\$173	-\$98		
Specialized equipment			\$/ac/yr	
Land roller			\$3.54	
Flex header			\$5.01	
TOTAL			\$8.55	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$9.99	
Break Even Yield		bu/ac	53	

AGRONOMICS

Variety Selection:

Select a low corn heat unit (**CHU**) and early maturing variety. Soy bean maturity is determined by photosensitivity and the earliest maturing type is considered a **000** variety, which is most suitable for Saskatchewan. **2300 to 2400 CHU** is considered low. Refer to the publication "Crop Varieties for Irrigation" for production data specific to irrigation in Saskatchewan.

Seeding:

Plant population 45.0 plants/sq m.
TKW Variable grams
Soil temperature needs to be at least 10°C. Roll after seeding.
TKW is variety-specific; adjust seeding rate accordingly.

Fertilization:

- **Inoculant**—Soy beans require a specific species of rhizobia not native to Saskatchewan soil. Double inoculation is recommended on new fields.
- **Nitrogen**—Soy bean are not as efficient as other legumes at nitrogen fixation. If plants start yellowing around flowering consider a top-dress application of 40–50 lbs/ac N.
- **Phosphate**—Do not exceed 20 lbs/ac P₂O₅ seed placed phosphorus in solid seeded production. Higher rates need to be side banded.

Crop Water Use and Irrigation:

Irrigation scheduling recommendations have not been developed for Saskatchewan. The critical watering period is between flowering and pod fill.

Harvest:

Harvest will likely begin following a killing frost. Harvest at maximum of 20% moisture. 14% moisture is ideal for harvest. Plants are considered mature when 95% of pods have turned "buckskin."

Handling, Storage, and Grading:

Store soy beans from 10–13% moisture. 5% green and 15% splits and cracks are the maximum grading factors before deductions.

Rotations and Crop Protection:

Soy beans fit into rotation similar to any pulse crop. Most soy bean varieties are glyphosate tolerant. Seed treatment is a must in our cooler soil with soy beans being affected by pythium, rhizoctonia, and fusarium root rots. Soy beans are not competitive with weeds at the seedling stage and may require more than one herbicide application. A fungicide application may be required to control sclerotinia.

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Flax

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$19.20	
Seed treatment			\$0.00	
Soil test			\$1.00	
Fertilizer:	N	100 lb	\$58.19	
	P ₂ O ₅	35 lb	\$20.97	
	K ₂ O	0 lb	\$0.00	
Herbicide			\$25.20	
Insecticide			\$0.00	
Fungicide			\$14.97	
Equipment fuel			\$16.42	
Equipment repair			\$8.29	
Custom work			\$0.00	
Irrigation power	4.0	inches	\$8.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.56	
Crop insurance	31	bu/ac	\$9.16	
Hail insurance			\$7.80	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$4.96	
Total Cash Costs			\$241.20	
Farm Equipment & Buildings			\$65.79	
Irrigation System			\$28.03	
Specialized Equipment			\$0.00	
Land			\$56.25	
Total Non-Cash Costs			\$150.07	
Total Costs			\$391.27	
Returns	AVG	Target		
Yield bu/ac	40	50		
Price \$/bu		\$9.44		
Gross	\$378	\$472		
Net Return	-\$14	\$81		
Specialized Equipment		\$/ac/yr		
TOTAL			\$0.00	
Break Even using Target Returns & Total Costs				
Break Even Price	\$/ac	\$7.83		
Break Even Yield	bu/ac	41		

AGRONOMICS

Variety Selection:

Prairie Thunder, CDC Bethune, and Prairie Sapphire are high yielding with good lodging resistance. Refer ICDCs **Crop Varieties for Irrigation** for assistance. Use certified seed or seed must be tested to be deemed free of GMO flax.

Seeding:

Plant population 500.0 plants/sq m.
TKW 5.0 grams
Seeding Rate 40.0 lb/ac

Early May seeding produces highest yield. If seedbed is dry, irrigate prior to seeding rather than after seeding.

Fertilization:

Apply 90–100 lb/ac N and 30–35 lb/ac P₂O₅.
A soil test will provide recommendations for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 350–450 mm; avg. 372 mm
- Seeding: 1-3 mm/day
- Flowering: peak use of 7 mm/day

The critical irrigation period extends from flowering through to the initiation of seed ripening. The scheduling goal for flax is to maintain adequate soil moisture to extend flowering and ensure that all flowers develop seed. Irrigation operations must end by the second week of August for flax to reach maturity.

The active root zone of flax is 1.0 metre. Maintain the soil water content at or above 50% field capacity.†

Harvest:

Swath or desiccate when 75% of bolls have turned brown. Immature seed will blacken from -3° to -5°C frost. Early swathing will reduce seed size but not cause blackening.

Handling, Storage, and Grading:

Dry 10%; Tough 10.1%; Damp 13.5%

Rotations and Crop Protection:

Three or more years between flax crops is recommended to control soil and stubble-borne disease such as Fusarium Wilt and rust. Registered flax varieties are resistant to rust and moderately resistant to Fusarium Wilt. Seeding flax on cereal, corn, or legume stubble is the best rotation choice. Flax on canola or potato stubble is not recommended, as seeding on legume or potato stubble makes it more susceptible to seedling blight (Rhizoctonia diseases). An application of fungicide is recommended to control pasmo.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

✂ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Pea

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$36.00	
Seed treatment/inoculant			\$23.45	
Soil test			\$1.00	
Fertilizer:	N	0	lb	\$0.00
	P ₂ O ₅	30	lb	\$17.97
	K ₂ O	0	lb	\$0.00
Herbicide			\$28.46	
Insecticide			\$0.00	
Fungicide			\$20.82	
Equipment fuel			\$18.35	
Equipment repair			\$10.81	
Custom work			\$0.00	
Irrigation power	2.5	inches	\$5.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.12	
Crop insurance	42	bu/ac	\$6.79	
Hail insurance			\$15.60	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating int	4.2	%	\$4.85	
Total Cash Costs			\$235.70	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$8.55	
Land			\$56.25	
Total Non-Cash Costs			\$158.62	
Total Costs			\$394.33	
Returns	AVG	Target		
Yield bu/ac	55	75		
Price \$/bu (#2 or better yellow)			\$6.84	
Gross	\$376	\$513		
Net Return	-\$18	\$119		
Specialized Equipment			\$/ac/yr	
Flex Header			\$5.01	
Land Roller			\$3.54	
TOTAL			\$8.55	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$5.26	
Break Even Yield		bu/ac	58	

AGRONOMICS

Variety Selection:

Yellow: Agassiz, CDC Centennial, Argus. Green: CDC Raezer. High-yielding, lodging resistant varieties are recommended for irrigation. See ICDCs *Crop Varieties for Irrigation*.

Seeding:

Plant population	80.0	plants/sq m.
TKW	240.0	grams
Seeding Rate	180.0	lb/ac

Seed in late April/early May. Roll after seeding. TKW is variety specific; adjust seeding rate accordingly. Test seed for disease.

Fertilization:

Inoculate with a pea inoculant. Apply 30 lb/ac P₂O₅. Use a soil test for field-specific fertilizer application based on soil nutrient levels and crop needs. Peas have strong association with mycorrhiza to supplement P and micronutrient uptake.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 250–350 mm; avg. 300 mm ☼
- Vegetative Stage: 3 to 5 mm/day
- Flowering to Pod Formation Stages: 5 to 6 mm/day

Allow the canopy to dry between irrigation to reduce disease pressure and lodging. Use a soil probe to check moisture.†

Harvest:

Swath directly ahead of the combine or straight cut when the peas are mature to avoid wind damage. Use a flex header, pick-up reel, and vine lifters. Combine at 16-18% moisture and aerate, to prevent seed damage.

Handling, Storage, and Grading:

Dry 16 %; Tough 16.1%; Damp 18.0%

Rotations and Crop Protection:

Three years between pea crops. Check recropping restrictions on Group 2 and Group 4 herbicides. Irrigated pea yields have declined in recent years due to increased disease.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Faba Bean

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$36.00	
Seed treatment / inoculant			\$11.00	
Soil test			\$1.00	
Fertilizer:	N	0	lb	\$0.00
	P ₂ O ₅	50	lb	\$29.96
	K ₂ O	0	lb	\$0.00
Herbicide			\$66.50	
Insecticide			\$0.00	
Fungicide			\$19.95	
Equipment fuel			\$21.25	
Equipment repair			\$9.54	
Custom work			\$0.00	
Irrigation power	7.0	inches	\$14.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$27.43	
Crop insurance	1238	lb/ac	\$7.64	
Hail insurance			\$15.60	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$5.89	
Total Cash Costs			\$286.23	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$0.33	
Land			\$56.25	
Total Non-Cash Costs			\$150.40	
Total Costs			\$436.64	
Returns	AVG	Target		
Yield lb/ac	2400	3600		
Price \$/lb		\$0.10		
Gross	\$240	\$360		
Net Return	-\$197	-\$77		
Specialized equipment			\$/ac/yr	
Sideknife			\$0.33	
TOTAL			\$0.33	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$0.12	
Break Even Yield		lb/ac	4366	

AGRONOMICS

Variety Selection:

Marketing prospects should guide variety choice. Florent is an early maturing variety with high yield potential and is suitable for food markets. Snowbird is a small-seeded zero tannin variety suitable for feed markets and silage harvest. Malik is a large seeded tannin variety suitable for the export food market. See ICDCs *Crop Varieties for Irrigation*.

Seeding:

Plant population	40.0	plants/sq m.
TKW	440.0	grams
Seeding Rate	180.0	lb/ac

Faba bean is late maturing. Plant early to ensure increased height of the lowest pods for best yield results.

Fertilization:

Faba bean fixes a large amount of nitrogen. Inoculate with a faba bean inoculant. Apply 40–50 lb/ac P₂O₅. A soil test will provide recommendations for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation:

- Vegetative Stage: 2.5 to 6 mm/day
- Flowering to Pod Filling Stages: 6 to 8 mm/day
- Ripening Stage: < 6 mm/day

Maintain good soil moisture through the growing season. Allow the canopy to dry between irrigations to minimize disease pressure and lodging. Use a soil probe to check moisture status.†

Harvest:

Swath when 25% of plants have lower pods turning black, or September 7 whichever occurs first. Lay down a light swath as swaths take a long time to dry. Combine at 16–18% moisture and aerate to prevent seed damage. Early swathing will reduce seed size but not quality. Frost on immature seed will reduce quality.

Handling, Storage, and Grading:

Dry 16% ; Tough 16.1%; Damp 18.0%

Rotations and Crop Protection:

Two years between faba bean and another pulse crop. Check recropping restrictions on Group 2 (Ally, Everest, Sundance) and Group 4 herbicides. Faba bean is a good "break crop" as it is less susceptible to disease than other pulses. Chocolate spot (botrytis) can be a problem.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com. Use The Pulse Production Manual from The Saskatchewan Pulse Growers Association.

CROP: Red Lentil

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$18.00	
Seed treatment / inoculant			\$15.15	
Soil test			\$1.00	
Fertilizer:	N	0	lb	\$0.00
	P ₂ O ₅	30	lb	\$17.97
	K ₂ O	0	lb	\$0.00
Herbicide			\$36.73	
Insecticide			\$0.00	
Fungicide			\$20.82	
Equipment fuel			\$18.35	
Equipment repair			\$10.81	
Custom work			\$0.00	
Irrigation power	2.5	inches	\$5.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.12	
Crop insurance	1069	lb/ac	\$11.23	
Hail insurance			\$15.60	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$4.56	
Total Cash Costs			\$221.83	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$8.55	
Land			\$56.25	
Total Non-Cash Costs			\$158.62	
Total Costs			\$380.45	
Returns	AVG	Target		
Yield lb/ac	2000	2400		
Price \$/lb (#2 or better small red)			\$0.21	
Gross	\$420	\$504		
Net Return	\$40	\$124		
Specialized equipment			\$/ac/yr	
Flex header			\$5.01	
Land roller			\$3.54	
TOTAL			\$8.55	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$0.16	
Break Even Yield		lb/ac	1812	

AGRONOMICS

Variety Selection:

Red lentil varieties have not been evaluated under irrigation. Choose a variety with determinate growth habit.

Seeding:

Plant population 120.0 plants/sq m.
TKW 40.0 grams
Seeding Rate 45.0 lb/ac

Test seed for disease. Seed in late April to early May. Roll after seeding.

Fertilization:

Inoculate with a lentil inoculant. Apply 30 lb/ac P₂O₅. Use a soil test for field-specific fertilizer application based on soil nutrient levels and crop needs. Lentil has a strong association with mycorrhiza to supplement P and micronutrient uptake.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 250–350 mm; avg. 300 mm

Allow the canopy to dry between irrigations to minimize disease pressure and lodging. Lentils are sensitive to waterlogging; excessive water application reduces lentil yields. Lentils are sensitive to moisture stress during flowering and pod fill. Use a soil probe to check moisture status.†

Harvest:

Desiccate when lower pods are tan and seeds rattle. Combine at 18% moisture and aerate to prevent seed damage. Straight cut with a flex header.

Handling, Storage, and Grading:

Dry 14% ; Tough 14.1%; Damp 16.0%

Rotations and Crop Protection:

Three years between lentil crops. Check recropping restrictions on Group 2 and Group 4 herbicides. Control the spread of disease by fungicide application.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com. Also refer to Saskatchewan Pulse Growers website at www.saskpulse.com.

CROP: Dry Bean

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$75.00	
Seed treatment / inoculant			\$11.00	
Soil test			\$1.00	
Fertilizer: * N	60	lb	\$34.92	
P ₂ O ₅	40	lb	\$23.96	
K ₂ O	0	lb	\$0.00	
Herbicide			\$37.00	
Insecticide			\$0.00	
Fungicide			\$39.90	
Equipment fuel			\$18.35	
Equipment repair			\$10.81	
Custom work			\$0.00	
Irrigation power	2.5	inches	\$5.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.12	
Crop insurance	1172	lb/ac	\$27.19	
Hail insurance			\$15.60	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$7.27	
Total Cash Costs			\$353.61	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$17.87	
Land			\$56.25	
Total Non-Cash Costs			\$167.94	
Total Costs			\$521.55	
Returns	AVG	Target		
Yield lb/ac	2700	3000		
Price \$/lb		\$0.25		
Gross	\$675	\$750		
Net Return	\$153	\$228		
Specialized equipment (\$/ac/yr)	Custom	Own		
Planter	\$19.00	\$5.01		
Row crop cultivator	\$24.00	\$1.34		
Band sprayer		\$1.50		
Undercutter/windrower	\$20.00	\$5.01		
Tractor accessories—3 pt hitch		\$3.34		
10" tube belt conveyor		\$1.67		
Combine	\$34.00			
TOTAL	\$97.00	\$17.87		

AGRONOMICS

Variety Selection:

AC Island and Medicine Hat have improved plant structure and high yield potential. White Mountain pinto beans may receive a quality premium. Choose an indeterminate short vine-type plant for irrigated production. Refer to ICDCs **Crop Varieties for Irrigation**.

Seeding:

Plant population 96000.0 plants/ac
TKW 345.0 grams
Seeding Rate 75.0 lb/ac

Seed after the danger of frost: May 20-25th. Seed weights vary with each market class and seed lot. See "Crop Varieties for Irrigation" for averages. Row crop equipment is required.

Fertilization:

Inoculate with a dry bean inoculant. Apply 50–60 lb/ac N and 30–40 lb/ac P₂O₅. Dry beans may respond to the micronutrient zinc.* A soil test will provide recommendations for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 250–350 mm; avg. 300 mm
- Vegetative Stage: 2 to 3.5 mm/day
- Flowering Stage: 3.5 to 5 mm/day
- Pod Formation Stage: 5 to 6.5 mm/day
- Ripening Stage: < 5 mm/day

Allow the canopy to dry between irrigations to minimize disease pressure and lodging. Use a soil probe to check moisture status.†

Harvest:

Undercut when 40% of pods are buckskin colour and leaves are still attached. Combine at 14–16% moisture to avoid seed damage. Handle beans gently, use conveyors and bean ladders.

Handling, Storage, and Grading:

Dry 15.4% ;Tough 15.5%; Damp 18.0%

Rotations and Crop Protection:

Check recropping restrictions on Group 2, 4, 6, 27 herbicides. Reduce White Mold (sclerotinia) incidence with crop rotation to non-host crops like cereals and flax, choosing a less susceptible upright variety like Winchester, and treating at the appropriate stage with a fungicide. Bacterial blight may require control with a copper-based foliar product.

* May require 5 lb/ac of zinc

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com. Use The Pulse Production Manual from The Sask Pulse Growers Association.

CROP: Corn—Grain

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$70.00	
Seed treatment			\$0.00	
Soil test			\$1.00	
Fertilizer: N	90	lb	\$52.38	
P ₂ O ₅	35	lb	\$20.97	
K ₂ O	15	lb	\$5.87	
Herbicide			\$26.04	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$12.88	
Equipment repair			\$5.37	
Custom work			\$0.00	
Irrigation power	4	inches	\$7.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.41	
Crop insurance			\$0.00	
Hail insurance			\$0.00	
Hired labour	0	hr/ac	\$0.00	
Grain Drying			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$5.22	
Total Cash Costs			\$253.61	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$5.01	
Land			\$56.25	
Total Non-Cash Costs			\$155.08	
Drying Costs				
Custom Drying \$/ac			\$18.75	
Total Costs			\$427	
Returns	AVG	Target		
Yield bu/ac	100	150		
Price \$/bu			\$3.60	
Gross	\$360	\$540		
Net Return	-\$67	\$113		
Specialized equipment			\$/ac/yr	
Planter			\$5.01	
Corn header			\$3.34	
TOTAL			\$5.01	
Break Even using Target Returns & Total Costs				
Break Even Price		\$/ac	\$2.85	
Break Even Yield		bu/ac	119	

AGRONOMICS

Variety Selection:

Select a variety for grain corn production that can reach maturity prior to first fall frost in your area. For corn heat unit map and variety selection information, refer to the Saskatchewan Ministry of Agriculture website. The Alberta Corn Committee website provides variety trial data for Saskatchewan.

Seeding:

TKW 380.0 grams
Seeding Rate 32,000.0 plants/ac

Fertilization:

Apply 90–100 lb/ac N, 35–40 lb/ac P₂O₅, and 10–15 lb/ac K₂O. Spring banding of fertilizer prior to seeding is recommended. Soil testing, including micronutrients, is recommended every 5 to 10 years.

If field conditions or soil texture cause concern for a high nutrient loss, fertigation may be an option. Sulfur application may be required.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 300–400 mm; avg. 342 mm
- Tasseling Stage: 5 mm/day
- Silking Stage: 6 mm/day
- Kernel Formation: 5 mm/day

Maintain soil moisture above 50% field capacity throughout the growing season. Use a soil probe to check moisture status.†

Harvest:

Can combine < 30% moisture with more cracking, but aim for < 20%. Safe storage is 14–15%.

Handling, Storage, and Grading:

Drying costs are based on \$0.125/bushel. Expect to dry corn in most years.

Rotations and Crop Protection:

Specialized equipment is required for seeding, but can be hired custom. Group 3 residues can stunt corn. Be aware of the potential problem of volunteers that may result from the consecutive use of the same herbicide system annually. Early weed control is essential for optimal production. Corn is susceptible to Fusarium infection.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☀ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Corn—Grazing

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$70.00	
Seed treatment			\$0.00	
Soil test			\$1.00	
Fertilizer:	N 90	lb	\$52.38	
	P ₂ O ₅ 35	lb	\$20.97	
	K ₂ O 0	lb	\$0.00	
Herbicide			\$26.04	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$6.44	
Equipment repair			\$5.50	
Custom work			\$0.00	
Irrigation power	4	inches	\$7.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$26.41	
Crop insurance			\$0.00	
Hail insurance			\$0.00	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$4.96	
Total Cash Costs			\$241.17	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$0.00	
Land			\$56.25	
Total Non-Cash Costs			\$150.07	
Total Costs			\$391.24	

AGRONOMICS

Variety Selection:

To select a corn variety for grazing, select an early-maturing silage corn variety. Silage varieties are more palatable and better suited for grazing than grain corn varieties. Refer to the corn heat unit map on the Saskatchewan Ministry website. Early seeding date is critical to ensuring crop receives adequate heat units for yield potential.

Seeding:

TKW 380.0 grams
Seeding Rate 32,000.0 plants/ac

Fertilization:

Apply 90–100 lb/ac N, 30–35 lb/ac P, and 10–15 lb/ac K. Spring banding of fertilizer prior to seeding is recommended. If corn is planted on a field previously grazed, fertilizer recommendations are 75–80 lb/ac N, 0 lb/ac P, and 10 lb/ac K. Sulfur application may be required. Soil testing, including micronutrients, is recommended every 5 to 10 years.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 300–400 mm; avg. 342mm ☼
- Tasseling Stage: 5 mm/day
- Silking Stage: 6 mm/day
- Kernel Formation: 5 mm/day

Maintain soil moisture above 50% field capacity throughout the growing season. Use a soil probe to check moisture status.†

Rotations and Crop Protection:

Early weed competition delays growth and decreases yield. Weed control up until inter-row closure (mid-July) is important.

Grazing Management:

When grazing corn, pregnant beef cows receive adequate levels of energy, protein, and phosphorus. Supplementation of calcium, trace minerals, and vitamins is essential when grazing corn. Four ounces of 3:1 mineral per day will generally satisfy these requirements. Consult a nutritionist to discuss your specific situation. Controlled grazing through the use of electric fence is essential to efficiently graze standing corn. Three-day allocations work well to minimize wastage. Cows with free access to corn will graze the cobs first, putting them at risk of grain overload and rumen acidosis. Corn maturity at the time of a killing frost will also dictate grazing management. If corn maturity has progressed to fully dent stage and is moving into physiological maturity, paddock size should be restricted to less than 3 days grazing. Cattle should receive other forages to reduce onset of acidosis and grain overload.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Corn—Silage

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$70.00	
Seed treatment			\$0.00	
Soil test			\$1.00	
Fertilizer:	N	90	lb	\$52.38
	P ₂ O ₅	35	lb	\$20.97
	K ₂ O	15	lb	\$5.87
Herbicide			\$26.04	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$6.44	
Equipment repair			\$5.50	
Custom work			\$0.00	
Irrigation power	4	inches	\$7.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			26.41	
Crop insurance			\$0.00	
Hail insurance			\$0.00	
Hired labour	0	hr/ac	\$0.00	
Other			\$0.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$5.08	
Total Cash Costs			\$247.17	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$5.01	
Land			\$56.25	
Total Non-Cash Costs			\$155.08	
Harvest Costs				
Custom silage \$/ac			\$264.00	
Total Costs			\$666	
Returns	AVG	Target		
Yield MT/ac @ 65% moisture	16	24		
Price \$/MT *			\$30	
Gross Return	\$480	\$720		
Net Return	-\$186	\$54		
Specialized equipment			\$/ac/yr	
Planter			\$5.01	
TOTAL			\$5.01	

AGRONOMICS

Variety Selection:

To select a corn variety for silage, choose a variety that is high yielding and reaches dent stage before frost damage. For corn heat unit map refer to the Saskatchewan Ministry of Agriculture website. An early seeding date is critical to ensure corn receives adequate heat units for yield potential.

Seeding:

TKW 380.0 grams
Seeding Rate 32,000.0 plants/ac

Fertilization:

Spring banding of fertilizer prior to seeding is recommended. Apply 90–100 lb/ac N, 35–40 lb/ac P₂O₅, and 10–15 lb/ac K₂O. Soil testing, including micronutrients, is recommended every 5 to 10 years.

If field conditions or soil texture cause concern for high nutrient loss, fertigation may be an option. Sulfur application may be required.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 300–400 mm; avg. 342 mm ☼
- Tasseling Stage: 5 mm/day
- Silking Stage: 6 mm/day
- Kernel Formation: 5 mm/day

Maintain soil moisture above 50% field capacity throughout the growing season. Use a soil probe to check moisture status.†

Harvest:

Cut at about 3/4 milk line. Moisture content will be about 65–70%. Corn silage price is for silage already at the pit. Price adjusted to 65% moisture of corn. Silage per tonne is based on the feed barley grain price times 11. Distance of haul will determine feasibility.

Rotations and Crop Protection:

Early weed control is essential. Early weed competition delays growth and decreases yield. Weed control up until inter-row closure (mid-July) is important.

* Value very dependent on location and market need.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation Saskatchewan.com.

CROP: Cereal—Silage

				My Farm	
ITEM	#	UNIT	\$/ac	\$/ac	
Seed			\$18.20		
Seed treatment			\$10.32		
Soil test			\$1.00		
Fertilizer:	N	90	lb	\$52.38	
	P ₂ O ₅	35	lb	\$20.97	
	K ₂ O	15	lb	\$5.87	
Herbicide			\$23.95		
Insecticide			\$0.00		
Fungicide*			\$0.00		
Equipment fuel			\$6.26		
Equipment repair			\$5.50		
Custom work			\$0.00		
Irrigation power	2	inches	\$4.00		
Irrigation repair			\$11.28		
Irrigation service/water charge			\$25.97		
Crop insurance			\$0.00		
Hail insurance			\$0.00		
Hired labour	0	hr/ac	\$0.00		
Other			\$0.00		
Farm overhead			\$9.20		
Operating interest	4.2	%	\$4.09		
Total Cash Costs			\$198.99		
Farm equipment & buildings			\$65.79		
Irrigation system			\$28.03		
Specialized equipment			\$0.00		
Land			\$56.25		
Total Non-Cash Costs			\$150.07		
Harvest Costs					
Custom silage \$/ac			\$154.00		
Total Costs			\$503		
Returns	AVG	Target			
Yield MT/ac @ 65% moisture	12	14			
Price \$/MT *			\$32		
Gross Return	\$389	\$454			
Net Return	-\$114	-\$49			
Specialized equipment			\$/ac/yr		
TOTAL			\$0.00		

Variety Selection:

Choose a variety based on dry matter yield, and disease and lodging resistance. Lodging and disease resistant varieties are best suited. Barley, oats, and triticale are grown. Refer to ICDCs **Crop Varieties for Irrigation**. Talk to your local forage specialist on forage varieties.

Seeding:

Plant population	320.0	plants/sq m.
TKW	41.0	grams
Seeding Rate	130.0	lb/ac

Fertilization:

Apply 90 N/ac, 35 P₂O₅/ac, and 15 K₂O/ac. A soil test will provide field-specific recommendations for fertilizer application based on soil nutrient levels and crop needs. Soil testing including micronutrients is recommended every 5 to 10 years.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 200–300 mm; avg. 247mm ☼
- Tillering: 1 to 3 mm/day
- Flag Leaf to Flowering: 7 to 8 mm/day

Critical stages for moisture are at tillering and at flowering. Maintain soil at > 50% available moisture. Use a soil probe to check moisture status.†

Cut cereals at soft dough stage; moisture content 65–70%. Barley silage is commonly priced on a per ton basis at 65% moisture, using the formula of feed barley grain price per bushel times a factor of 10. Distance of haul will determine feasibility.

Rotations and Crop Protection:

Fungicide seed treatment is recommended. Cereal on cereal will yield at least 15% less than cereal on broadleaf stubble, including silaged cereals. Break from cereal for one year to get higher yields and reduce disease build-up. Spot and net blotch can be severe in irrigated barley. May require an application of fungicide to control leaf disease.

* Value very dependent on location and market need.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigationsaskatchewan.com.

CROP: Seedling Alfalfa (no cover crop)

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed (c/w inoculant)			\$46.10	
Seed treatment			\$0.00	
Soil test			\$1.00	
Fertilizer:	N	0	lb	\$0.00
	P ₂ O ₅	100	lb	\$59.91
	K ₂ O	0	lb	\$0.00
Herbicide			\$6.28	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$14.08	
Equipment repair			\$5.00	
Custom work			\$0.00	
Irrigation power	8	inches	\$15.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$27.58	
Crop insurance			\$5.66	
Hail insurance			\$0.00	
Hired labour	0	hr/ac	\$0.00	
Other			\$3.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$4.29	
Total Cash Costs			\$208.37	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$10.74	
Land			\$56.25	
Total Non-Cash Costs			\$160.81	
Total Costs			\$369.18	
Returns	AVG	Target		
Yield MT/ac	2.0	2.5		
Price \$/MT		\$70		
Gross Return	\$140	\$175		
Net Return	-\$229	-\$194		
Specialized equipment			\$/ac/yr	
Mower/condition			\$4.15	
Round baler			\$6.60	
TOTAL			\$10.74	

AGRONOMICS

Variety Selection:

Select a variety that exhibits rapid re-growth, good winter hardiness and disease resistance. Refer to ICDs **Crop Varieties for Irrigation** for yield data on 50 different varieties. Talk to your local forage specialist for forage variety information.

Seeding:

Plant population 30 to 40 PLS/sq ft
Seed size 200,000 seeds/lb
Seeding Rate 10 lb/ac

Pure live seed (PLS) = Germination x Purity

Calculate seeding rate using formula:

$$\text{Seeding rate (lb/ac)} = \frac{\text{seeds/sq ft} \times \text{sq ft/acre} / \text{PLS}}{\text{seeds/lb}}$$

Recommended row spacing for irrigation is six inches.

Fertilization:

Soil testing prior to planting is recommended. Ensure purchased seed is inoculated. Apply 100 lb/ac actual P prior to establishment. On coarse textured soils, application of 40–45 lb/ac actual K is recommended.

Crop Water Use and Irrigation:

Irrigate seedling alfalfa to maintain soil moisture above 60% field capacity in top foot of soil. Frequent, light irrigation applications (15 mm/app) following germination are optimal. Once stand is well established, about six weeks after seeding, irrigate to maintain soil moisture above 50% field capacity in the top two feet. Use a soil probe to check moisture status.† Irrigate after cutting for fall regrowth to restore soil profile to field capacity. Monitor soil moisture to ensure that crop enters winter with 70% available soil water in the profile to avoid alfalfa winter kill or injury.

Harvest:

Cut at 25% bloom, mid to late July, for a single cut of hay in establishment year.

Handling, Storage, and Grading:

Percent moisture limits to prevent spoilage: small square bale - 18%; round soft core - 17%; round hard core - 16%

Rotations and Crop Protection:

Do not seed the year after treatment with Lontrel or other Group 4 residual broadleaf herbicides. Annual weeds can be controlled in-crop through cutting of crop prior to weed seed set.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Established Alfalfa (2-cut harvest)

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$0.00	
Seed treatment/inoculant			\$0.00	
Soil test			\$1.00	
Fertilizer:	N	0	lb	\$0.00
	P ₂ O ₅	50	lb	\$29.96
	K ₂ O	50	lb	\$19.58
Herbicide			\$0.00	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$11.73	
Equipment repair			\$5.37	
Custom work			\$0.00	
Irrigation power	8	inches	\$15.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$27.58	
Crop insurance			\$5.66	
Hail insurance			\$0.00	
Hired labour	1	hr/ac	\$21.00	
Other			\$5.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$3.41	
TOTAL CASH COSTS			\$165.76	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$16.22	
Land			\$56.25	
Total Non-Cash Costs			\$166.29	
Total Costs			\$332.05	
Returns		AVG	Target	
Yield MT/ac*		3.0	4.0	
Price \$/MT			\$85	
Gross Return		\$255	\$340	
Net Return		-\$77	\$8	
Specialized equipment			\$/ac/yr	
Mower/condition			\$4.15	
Round baler			\$6.60	
Hay rake (21-30 ft wheel)			\$2.89	
Bale mover			\$2.60	
TOTAL			\$16.22	

AGRONOMICS

Establishment year costs (p. 21) over 4 years of production are not included in budget.

Fertilization:

Most of the crop's nitrogen needs are met by fixation if properly inoculated. Phosphorus should be supplied annually or applied prior to establishment in large amounts. Fertilizer application is optimized with a disc bander or dribble band over broadcast application. Apply 50–75 lb/ac actual P annually. Increase this amount by two to three times if broadcast application is used. Potassium fertilizer can be broadcast supplied at a rate of 50–75 lb/ac actual K annually. Soil testing is recommended.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 400–500 mm; avg. 454 mm ☼
- Peak moisture use (before cutting): 9 mm/day (first cut)
- 8 mm/day (second cut)

Maintain soil moisture above 50% field capacity throughout the growing season. Use a soil probe to check moisture status. Irrigate immediately following each cut. Irrigate to restore root zone to 100% available moisture. Manage irrigations to ensure crop enters winter with 70% available moisture in the profile.

Harvest:

For good quality alfalfa, cut at 10% flower. First cut late June or early July; second cut should be completed by August 15. Delaying a cut will set back the dates of subsequent cuts & increase the chance of winter injury. To reduce the incidence of winter injury, the recommendation is not to cut alfalfa during the critical period four to six weeks prior to the first killing frost of -5°C.

Handling, Storage, and Grading:

Hay moisture limits to prevent spoilage: small square bale - 18%; round soft core - 17%; round hard core - 16%. Storing for quality is just as important as harvesting for quality.

Rotations and Crop Protection:

Aim for at least 6" regrowth before freeze-up.

- * Total yield per year
- † Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual
- ☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Established Alfalfa (3-cut harvest)

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$0.00	
Seed treatment/inoculant			\$0.00	
Soil test			\$1.00	
Fertilizer:	N	0	lb	\$0.00
	P ₂ O ₅	50	lb	\$29.96
	K ₂ O	50	lb	\$19.58
Herbicide			\$0.00	
Insecticide			\$0.00	
Fungicide			\$0.00	
Equipment fuel			\$17.62	
Equipment repair			\$8.06	
Custom work			\$0.00	
Irrigation power	8	inches	\$15.00	
Irrigation repair			\$11.28	
Irrigation service/water charge			\$27.58	
Crop insurance			\$5.66	
Hail insurance			\$0.00	
Hired labour	1	hr/ac	\$21.00	
Other			\$7.50	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$3.64	
Total Cash Costs			\$177.06	
Farm equipment & buildings			\$65.79	
Irrigation system			\$28.03	
Specialized equipment			\$16.22	
Land			\$56.25	
Total Non-Cash Costs			\$166.29	
Total Cost			\$343.36	
Returns		AVG	Target	
Yield MT/ac *		4.0	5.0	
Price \$/MT			\$100	
Gross Return		\$400	\$500	
Net Return		\$57	\$157	
Specialized equipment			\$/ac/yr	
Mower/condition			\$4.15	
Round baler			\$6.60	
Hay rake (21–30 ft wheel)			\$2.89	
Bale mover			\$2.60	
TOTAL			\$16.22	

AGRONOMICS

Establishment year costs (p. 21) over 4 years of production are not included in budget.

Fertilization:

Most of the crop's nitrogen needs are met by fixation, if properly inoculated. Phosphorus should be supplied annually. Apply fertilizer with disc bander or dribble band is optimal over broadcast application. Apply 50-75 lb actual P/ac annually. Increase this amount by two to three times if broadcast application is used. Potassium fertilizer can be broadcast supplied at a rate of 50-75 lb/ac actual annually. Soil testing is recommended.

Crop Water Use and Irrigation:

- Total seasonal crop water use: 400-500 mm; avg. 454 mm ☼
- Peak moisture use:
 - 8 mm/day in June before first cut
 - 8 mm/day in July before second cut
 - 7 mm/day in August before third cut

Maintain soil moisture above 50% field capacity throughout the growing season. Use a soil probe to check soil moisture status. Irrigate immediately following each cut. Irrigate to restore root zone to 100% available moisture. Manage irrigations to ensure crop enters winter with 70% available moisture in the profile.

Harvest:

For good quality alfalfa, cut at 10% flower. First cut late June or early July; second cut should be completed by August 15. Delaying a cut will set back the dates of subsequent cuts and increase the chance of winter injury. To reduce the incidence of winter injury, the recommendation is not to cut alfalfa during the critical period of four to six weeks prior to the first killing frost of -5°C.

Handling, Storage, and Grading:

Hay moisture limits to prevent spoilage: small square bale - 18%; round soft core - 17%; round hard core - 16%. Storing for quality is just as important as harvesting for quality.

Rotations and Crop Protection:

Aim for at least 6" regrowth before freeze-up.

* Total yield per year

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigation.saskatchewan.com.

CROP: Seed Potato (Norland Elite II variety)

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$676.00	
Seed treatment/inoculant			\$86.45	
Soil test			\$1.00	
Fertilizer:	N 105	lb	\$61.10	
	P ₂ O ₅ 60	lb	\$35.95	
	K ₂ O 30	lb	\$11.75	
Herbicide			\$48.00	
Insecticide			\$19.74	
Fungicide			\$140.46	
Equipment fuel			\$123.46	
Equipment repair			\$75.00	
Custom work			\$80.00	
Irrigation power	5	inches	\$9.00	
Irrigation repair *			\$0.00	
Irrigation service/water charge *			\$0.00	
Crop insurance	14	tons/ac	\$190.81	
Hail insurance			\$0.00	
Hired labour	15	hr/ac	\$315.00	
Inspection Fees & Testing			\$120.00	
Storage O & M			\$71.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$43.55	
Total Cash Costs			\$2,117.47	
Farm equipment & buildings			\$36.46	
Irrigation system *			\$0.00	
Specialized equipment			\$310.84	
Land rental rate			\$285.00	
Total Non-Cash Costs			\$632.30	
Total Costs			\$2,749.78	
Returns	AVG	Target		
Yield ton/ac	12	14		
Price \$/ton			\$440	
Gross Return	\$5,280	\$6,160		
Net Return	\$2,530	\$3,410		
Specialized equipment			\$/ac/yr	
Potato field equipment			\$130.30	
Potato handling equipment			\$60.14	
Potato storage facility			\$120.40	
TOTAL			\$310.84	

* Provided by landowner.

AGRONOMICS

This potato budget is based on a 500 acre potato farm that rents land.

Variety Selection:

Choose varieties based on the intended market.

Seeding:

Plant population	21780.0	plants/acre
Weight of Seed Piece	60.0	grams
Seeding Rate	1.3	tons/ac

Fertilization:

Fertilize according to soil test recommendations. Response to nitrogen varies by cultivar. Apply 90–105 lb/ac N, 45–60 lb/ac P₂O₅, and 20–30 lb/ac K₂O.

Crop Water Use and Irrigation:†

- Total seasonal crop water use: 300-400 mm; avg. 359mm ☼

Average weekly crop water use:

- June: 19 mm increasing to 38 mm weekly
- July: 38 mm weekly through the month
- August: 38 mm decreasing to 19 mm in 3rd week

Effect of adequate and consistent irrigation by crop stage:

- *Planting to Emergence* (1 to 2 weeks)—increases stem number and promotes early tuber initiation.
- *Emergence to Stolon Initiation* (2 to 3 weeks)—increases vegetative growth and tuber set.
- *Stolon Initiation to Tuber Set* (3 to 4 weeks)—increases stolon growth and tuber initiation.
- *Bulking* (4–8 weeks) increases tuber size and uniformity.

Maintain the soil water content above 70% field capacity.

Harvest:

Top kill: to ensure removal of vine growth that interferes with harvest to initiate maturity, control tuber size, and to prevent the spread of disease.

Handling, Storage, and Grading:

Field and storage inspection must be done by Canadian Food Inspection Agency.

Rotations and Crop Protection:

Use a four year rotation to minimize disease and weed problems. Do not seed where residues of Group 2 and 4 herbicides may be present. When renting out land for potato production, it is the land owner's responsibility to disclose herbicide use, including spot usage for perennial weed control. When in doubt, consult a potato specialist.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

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CROP: Table Potato (Norland Variety)

ECONOMICS

ITEM	#	UNIT	\$/ac	My Farm \$/ac
Seed			\$396.00	
Seed treatment/inoculant			\$59.85	
Soil test			\$1.00	
Fertilizer: N	135	lb	\$78.56	
P ₂ O ₅	60	lb	\$35.95	
K ₂ O	30	lb	\$11.75	
Herbicide			\$48.00	
Insecticide			\$19.74	
Fungicide			\$140.46	
Equipment fuel			\$126.90	
Equipment repair			\$75.00	
Custom work			\$80.00	
Irrigation power	5	inches	\$9.00	
Irrigation repair *			\$0.00	
Irrigation service/water charge *			\$0.00	
Crop insurance	11	tons/ac	\$154.79	
Hail insurance			\$0.00	
Hired labour	15	hr/ac	\$315.00	
Other			\$0.00	
Storage O & M			\$71.00	
Farm overhead			\$9.20	
Operating interest	4.2	%	\$34.28	
Total Cash Costs			\$1,666.47	
Farm equipment & buildings			\$36.46	
Irrigation system *			\$0.00	
Specialized equipment			\$310.84	
Land rental rate			\$285.00	
Total Non-Cash Costs			\$632.30	
Total Costs			\$2,298.77	
Returns	AVG	Target		
Yield ton/ac	14	16		
Price \$/ton			\$330	
Gross Return	\$4,620	\$5,280		
Net Return	\$2,321	\$2,981		
Specialized equipment			\$/ac/yr	
Potato field equipment			\$130.30	
Potato handling equipment			\$60.14	
Potato storage facility			\$120.40	
TOTAL			\$310.84	

* Provided by landowner.

AGRONOMICS

This potato budget is based on a 500 acre potato farm that rents land.

Variety Selection:

Choose varieties based on the intended market.

Seeding:

Plant population	14520.0	plants/acre
Weight of Seed Piece	60.0	grams
Seeding Rate	0.9	tons/ac

Fertilization:

Soil test to ensure adequate fertility for yield and quality. Fertilization with 28-0-0 is often utilized to meet fertility requirements and avoid nutrient leaching. Apply 120–135 lb/ac N, 45–60 lb/ac P₂O₅, and 20–30 lb/ac K₂O.

Crop Water Use and Irrigation:†

- Total seasonal crop water use: 300–400 mm; avg. 359mm ☼

Average weekly crop water use:

- June: 19 mm increasing to 38 mm weekly
- July: 38 mm weekly through the month
- August: 38 mm decreasing to 19 mm in 3rd week

Effect of adequate and consistent irrigation by crop stage:

- *Planting to Emergence* (1 to 2 weeks)—increases stem number and promotes early tuber initiation.
- *Emergence to Stolon Initiation* (2 to 3 weeks)—increases vegetative growth and tuber set.
- *Bulking* (4 to 8 weeks)—increases tuber size and uniformity.

Maintain soil water content above 70% field capacity.

Harvest:

Top kill: to remove vine growth that interferes with harvest to initiate maturity, control tuber size, and to prevent the spread of disease.

Rotations and Crop Protection:

Use a four year rotation to minimize disease and weed problems. Do not seed where residues of Group 2 and 4 herbicides may be present. When renting out land for potato production, it is the land owner's responsibility to disclose herbicide use, including spot usage for perennial weed control. When in doubt, consult a potato specialist.

† Refer to the Saskatchewan Ministry of Agriculture Irrigation Scheduling Manual

☼ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, Saskatchewan

More Information:

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Appendix A

CROP	Variety	Seed Cost	Seed Treatment	Burnoff	Herbicide	Fungicide	Custom Costs	Other Costs
Hard Wheat	Utmost	\$0.28/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Traxos/ Octane	Prosaro		
Durum	Brigade	\$0.35/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Traxos/ Octane	Prosaro		
CPS Wheat	Conquer	\$0.21/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Traxos/ Octane	Prosaro		
Soft Wheat	Sadash	\$0.23/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Traxos/ Octane	Prosaro		
Malt Barley	Copeland	\$0.20/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Achieve Liquid Gold	Tilt		
Feed Barley	Austenson	\$0.14/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Achieve Liquid Gold	Tilt		
Oats	Ministrel	\$0.16/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Frontline XL			
Canola	L130	\$11.25/lb*	Helix~	Glyphosate / Cleanstart	Liberty	Proline		
Soy bean	TH33003R2Y	\$92/ac*	Cruiser Maxx Pulse~	Glyphosate / Heat	Glyphosate			
Flax	Prairie Saffire	0.48/lb		Glyphosate / Authority	Buctril M	Headline		
Pea	Amarillo	\$0.20/lb	Cruiser Maxx Pulse	Glyphosate / Heat	Viper ADV	Headline		
Faba bean	Snowbird	\$0.20/lb	Cruiser Maxx Pulse	Glyphosate	Edge/ Basagran/ Reglone	Lance		
Red Lentil	Maxim	\$0.40/lb	Cruiser Maxx Pulse	Glyphosate / Heat	Solo/ Reglone	Headline		
Dry Bean	AC Island (Pinto)	\$1.00/lb	Cruiser Maxx Pulse~		Edge / Basagran	Lance (2 app)		
Grain Corn	P7213	\$70.00/ac*	Poncho~	Glyphosate / Cleanstart	Glyphosate		Grain drying	
Corn Grazing	39V05	\$70.00/ac*	Poncho~	Glyphosate / Cleanstart	Glyphosate			
Corn Silage	39V05	\$70.00/ac*	Poncho~	Glyphosate / Cleanstart	Glyphosate		Silage	
Barley Silage	Austenson	\$0.14/lb	Cruiser Maxx Vibrance	Glyphosate / Cleanstart	Achieve Liquid Gold		Silage	
Seedling Alfalfa	Vision	\$4.61/lb		Glyphosate				Twine
Alfalfa (2 or 3 cut)	N/A							Twine
Seed Potato	Norland E2	\$520/ton			Eptam 8-E; Reglone	Bravo; Dithane; Quadris	8 aerial spray	Inspection/ Soil Test
Table Potato	Norland E3	\$440/ton				Bravo; Dithane; Quadris	8 aerial spray	

* Seed price includes the Technology User Agreement for corn, soy bean and canola.

~ Seed treatment included with the seed

The seed varieties and products used in Appendix A were chosen for budget assumptions only and are not suggestions.

For more information:

Crop Varieties for Irrigation — for variety selection

www.irrigation.saskatchewan.com

Saskatchewan Ministry of Agriculture – Crops & Irrigation Branch – Outlook (306) 867-5500

The research ICDC conducts is summarized in several useful publications, including:

- Annual Research and Demonstration Program Report
- Irrigated Alfalfa Production in Saskatchewan
- Management of Irrigated Dry Beans
- Corn Production
- Irrigation Economics and Agronomics
- Crop Varieties for Irrigation (annual update)
- Irrigation Scheduling Manual
- *The Irrigator* (annual newsletter)

For these and other publications concerning irrigation in Saskatchewan, see our web site:

www.irrigationsaskatchewan.com/icdc



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