2023

Irrigation Crop Diversification Corporation

Irrigation Economics and Agronomics

ICDC
Irrigation Crop Diversification Corporation

To research and provide leadership in irrigation production.

Saskatchewan

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Irrigation Crop Budget Assumptions

Projected crop prices and input costs for 2023 are based in part on the prices used in the November Farm Income Forecast. Crop pricing information can become outdated very quickly, so producers should continually adjust these figures as seeding approaches.

Seed costs are taken from the *2023 Crop Planning Guide* and are for certified seed. Certified seed is assumed to be used for all crops sown.

Seed treatment and **inoculant** products and costs are based on the prices listed in the *2023 Crop Planning Guide*.

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 taken from the Saskatchewan Ministry of Agriculture *Crop Planning Guide 2023*:

- Nitrogen based on 46-0-0 at $1,200/tonne ($1.18/lb actual nutrient)
- Nitrogen based on 28-0-0 at $761/tonne ($1.23/lb actual nutrient)
- Phosphorus based on 11-52-0 at $1,340/tonne ($1.04/lb actual nutrient)
- Potassium based on 0-0-60 at $1,100/tonne ($0.80/lb actual nutrient)

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

Herbicide, **insecticide**, and **fungicide** Herbicide costs used in this guide reflect the practice of herbicide layering for prevention or management of herbicide-resistant populations. This practice may involve the use of two or more modes of action for control of some weeds in that crop. This guide assumes that commonly encountered insects and crop diseases are controlled through the use of the appropriate pesticides for the crop and pest combinations as a standard practice. The assumptions in this guide are only to demonstrate how the guide can be used to cost a crop protection plan. Producers must use their own costs based on the individual weed, insect, and disease pressures. Chemical costs are set using Suggested Retail Price (SRP) costs as well as full rate application. Prices can vary significantly from SRP rates. Refer to Appendix A for more details on product examples.

Equipment repair costs are based on the Saskatchewan Ministry of Agriculture *Crop Planning Guide 2023*. Equipment fuel and repair for other crops is estimated based on producer experience. Fuel cost based on $1.40/L of diesel including delivery.

Custom work and hired labour are based on the *Crop Planning Guide 2023* ($27.00/hour).

Irrigation application rates are based on the 1980-2022 average seasonal rainfall for the Outlook area of 9 inches, and the average measured seasonal crop water use.

Irrigation pumping power costs are based on a 40 hp pump and a 7 tower low pressure pivot.

Irrigation repair cost is based on 1.5% of $150,000 (pivot, pump, and mainline cost) over 133 acres.

Irrigation service charge based on the 2021 rate for SSRID per acre (base $48.20)

Be aware: district charges vary depending on delivery system.

Crop insurance rates are based on the insurance cost on Enhanced Irrigation Coverage.

Hail insurance rates are based on $350.00/ac coverage at 3.5% premium for 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 4.5% for 8 months (consistent with the Saskatchewan Ministry of Agriculture *Crop Planning Guide 2023*).

Farm equipment and buildings annual cost is based on 5% annual interest being charged against the value of the assets of a 3000 acre sample farm.

Irrigation system cost is equal to a payment at 5% interest based on a system value of $75,000 (50% of new cost $150,000) irrigating 133 acres.

Special Crop Equipment

- Row crop equipment costs used in the dry bean budget: Row crop planter is based on 600 acres of use annually for 15 years, row crop cultivator, undercutter, and dry bean combine is based on 300 acres of use annually for 15 years.
- Row Crop equipment costs used in the corn budget: Row crop planter is based on 600 acres of use annually for 15 years and corn header is based on 300 acres of use annually for 15 years.
- Hay equipment costs used in alfalfa budget: baler, mower/conditioner and hay rake costs are based on 500 ac of use annually for 10 years, bale mover for 15 years. In a 3 cut system equipment is valued at 60% useable life to 6 and 9 years.

Land investment cost is calculated at a 3.5% return on investment of $4000 per cultivated acre.

Grain prices are taken from the 2023 Crop Planning Guide are based in part on the prices used in the November Farm Income Forecast. Crop pricing information can become outdated very quickly, so producers should continually adjust these figures as seeding approaches.

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.

Hard Wheat

ECONOMICS

Item			Unit	$/ac	My Farm $/ac
Seed				$35.20	
Seed treatment				$7.70	
Soil test				$1.00	
Fertilizer:	N	135	lb	$159.79	
	P2O5	45	lb	$46.76	
	K2O	0	lb	$0.00	
Herbicide				$47.26	
Insecticide *				$12.90	
Fungicide				$11.85	
Equipment fuel				$29.91	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		5.1	inches	$10.63	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.69	
Crop insurance		55	bu/ac	$6.40	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$23.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$11.15	
Total Cash Costs				**$506.80**	
Farm Equipment & Buildings				$92.49	
Irrigation System				$40.01	
Specialized Equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$779.29**	
Returns			**AVG**	**Target**	
Yield bu/ac			75	90	
Price $/bu (#1 13.5%)				$10.15	
Gross Return			**$761**	**$914**	
Net Return			**-$18**	**$134**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$8.66**	
Break Even Yield			bu/ac	**77**	

AGRONOMICS

Variety Selection

Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	250	plants/sq. m.
TKW	42	grams
Seeding Rate	110	lb/ac

Seed before May 15th.

Fertilization

Apply 120–135 lb/ac N and 30–45 lb/ac P_2O_5
A soil test will give 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. 357 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. Direct harvest below 14.5% moisture for safe storage.

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 than wheat on broadleaf stubble due to disease build-up. 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 Canada-Saskatchewan Irrigation Diversification Centre *Irrigation Scheduling Manual*
⁂ 10 year average crop water use determined from seasonal evapotranspiration from Outlook, SK

More Information

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

Durum

ECONOMICS

Item			UNIT	$/ac	My Farm $/ac
Seed				$39.60	
Seed treatment				$8.40	
Soil test				$1.00	
Fertilizer:	N	165	lb	$195.30	
	P_2O_5	40	lb	$41.56	
	K_2O	0	lb	$0.00	
Herbicide				$17.32	
Insecticide *				$12.90	
Fungicide				$11.85	
Equipment fuel				$23.85	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		5.1	inches	$10.63	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.69	
Crop insurance		67	bu/ac	$19.96	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$23.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$11.45	
Total Cash Costs				**$520.16**	
Farm Equipment & Buildings				$92.49	
Irrigation System				$40.01	
Specialized Equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$792.66**	
Returns			**AVG**	**Target**	
Yield bu/ac			85	100	
Price $/bu (#1 13.5%)				$12.03	
Gross Return			**$1,023**	**$1,203**	
Net Return			**$230**	**$410**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$7.93**	
Break Even Yield			bu/ac	**66**	

AGRONOMICS

Variety Selection

Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	250	plants/sq. m.
TKW	45	grams
Seeding Rate	120	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 P_2O_5. 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. Direct harvest below 14.5% moisture for safe storage.

Handling, Storage, and Grading

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection

Fungicide seed treatment recommended. 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.

* Wheat midge may require control.

† Refer to the the Canada-Saskatchewan Irrigation Diversification Centre *Irrigation Scheduling Manual*

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

More Information

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Malt Barley

ECONOMICS

ITEM	#	UNIT	$/ac	My Farm $/ac
Seed			$35.96	
Seed treatment			$8.12	
Soil test			$1.00	
Fertilizer: N	85	lb	$100.61	
P_2O_5	30	lb	$31.17	
K_2O	15	lb	$12.07	
Herbicide			$75.69	
Insecticide			$12.90	
Fungicide			$11.85	
Equipment fuel			$29.81	
Equipment repair			$10.15	
Custom work			$0.00	
Irrigation power	2.4	inches	$5.00	
Irrigation repair			$16.92	
Irrigation service/water charge			$48.90	
Crop insurance	72	bu/ac	$9.32	
Hail insurance			$12.25	
Hired labour	1	hr/ac	$21.50	
Other			$0.00	
Farm overhead			$13.85	
Operating interest	4.5	%	$10.28	
Total Cash Costs			**$467.35**	
Farm equipment & buildings			$92.49	
Irrigation system			$40.01	
Specialized equipment			$0.00	
Land			$140.00	
Total Non-Cash Costs			**$272.50**	
Total Costs			**$739.85**	

Returns	**AVG**	**Target**	
Yield bu/ac	100	120	
Price $/bu (2-row select)		$6.76	
Gross	**$676**	**$811**	
Net Return	**-$64**	**$71**	

Specialized Equipment		$/ac/yr	
TOTAL		$0.00	

Break Even using Target Returns & Total Costs			
Break Even Price	$/ac	**$6.17**	
Break Even Yield	bu/ac	**109**	

AGRONOMICS

Variety Selection

Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	270	plants/sq. m
TKW	41	grams
Seeding Rate	116 lb/ac	

Seed before May 15th.

Fertilization

Apply 80–90 lb/ac N, 25–30 lb/ac P_2O_5, and 15–20 lb/ac K_2O. 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. Direct harvest below 14.5% moisture for safe storage.

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 and fusarium head blight severity by variety selection, applying fungicide, and leaving two years between barley crops.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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.

Feed Barley

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$40.30	
Seed treatment				$9.10	
Soil test				$1.00	
Fertilizer:	N	100	lb	$118.36	
	P_2O_5	30	lb	$31.17	
	K_2O	15	lb	$12.07	
Herbicide				$81.22	
Insecticide				$12.90	
Fungicide				$11.85	
Equipment fuel				$29.81	
Equipment repair				$10.51	
Custom work				$0.00	
Irrigation power		2.4	inches	$5.00	
Irrigation repair				$16.92	
Irrigation service/water charge				$48.90	
Crop insurance		72	bu/ac	$9.32	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$21.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$10.93	
Total Cash Costs				**$496.00**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$769.10**	
Returns			**AVG**	**Target**	
Yield bu/ac			110	130	
Price $/bu (1 CW)				$6.16	
Gross			**$678**	**$801**	
Net Return			**-$92**	**$32**	
Specialized equipment				$/ac/yr	
TOTAL				$0.00	

Break Even using Target Returns & Total Costs			
Break Even Price	$/ac	**$.92**	
Break Even Yield	bu/ac	**125**	

AGRONOMICS

Variety Selection

Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	320	plants/sq. m.
TKW	41	grams
Seeding Rate	130 lb/ac	

Seed before May 15th

Fertilization

Apply 95–105 lb/ac N, 25–30 lb/ac P_2O_5, and 15–20 lb/ac K_2O. 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. Direct harvest below 14.5% moisture for safe storage.

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, leaving two years between barley crops, and fungicide application. Smuts reduce suitability of feed barley.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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.

Milling Oats

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$38.40	
Seed treatment				$8.40	
Soil Sample				$1.00	
Fertilizer:	N	50	lb	$59.18	
	P_2O_5	20	lb	$20.78	
	K_2O	0	lb	$0.00	
Herbicide				$29.61	
Insecticide				$12.90	
Fungicide				$7.76	
Equipment fuel				$29.81	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		3.0	inches	$6.25	
Irrigation repair				$16.31	
Irrigation service/water charge				$49.08	
Crop insurance		79	bu/ac	$16.31	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$21.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$7.97	
Total Cash Costs				**$362.11**	
Farm Equipment & Buildings				$92.49	
Irrigation System				$40.01	
Specialized Equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$634.61**	
Returns			**AVG**	**Target**	
Yield bu/ac*			120	150	
Price $/bu				$5.19	
Gross			**$623**	**$779**	
Net Return			**-$12**	**$144**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$4.23**	
Break Even Yield			bu/ac	**122**	

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	plants/sq. m.
TKW	41	grams
Seeding Rate	120	lb/ac

Seed before May 15th

Early planting consistently produces oat crops with higher yield and kernel weight than late planting. 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 re-cropping 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.irrigationsaskatchewan.com. Refer to Prairie Oat Growers: www.poga.ca.

Canola

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$95.70	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	160	lb	$189.38	
	P_2O_5	40	lb	$41.56	
	K_2O	0	lb	$$0.00	
Herbicide				$131.34	
Insecticide *				$6.13	
Fungicide				$34.99	
Equipment fuel				$31.56	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		6.5	inches	$13.54	
Irrigation repair				$16.92	
Irrigation service/water charge				$50.10	
Crop insurance		51	bu/ac	$13.28	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$21.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$15.37	
Total Cash Costs				**$698.61**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$971.11**	
Returns			**AVG**	**Target**	
Yield bu/ac			60	70	
Price $/bu				$17.61	
Gross			**$1,057**	**$1,233**	
Net Return			**$85**	**$262**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$13.87**	
Break Even Yield			bu/ac	**55**	

AGRONOMICS

Variety Selection
Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	100	plants/sq. m.
TKW Hybrid Canola	5	grams
Seeding Rate	6	lb/ac

Seed before May 15th.

Fertilization
Apply 145–160 lb/ac N and 30–40 lb/ac P_2O_5. 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.
New pod shatter resistant varieties have a good fit under irrigation. Pre-harvest glyphosate and/or heat is recommended for even maturity, increased dry down, and weed control. Apply pre-harvest herbicide at 80-90% seed colour change. Direct harvest below 10% moisture for safe storage.

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 disease.

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

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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. Use the ***Canola Growers Manual*** from the Canola Council of Canada.

Soybean

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$81.25	
Seed treatment				$14.00	
Soil Test				$1.00	
Fertilizer:	N	0	lb	$0.00	
	P_2O_5	20	lb	$20.78	
	K_2O	0	lb	$0.00	
Herbicide				$48.26	
Insecticide				$0.00	
Fungicide				$0.00	
Equipment fuel				$33.31	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		3.5	inches	$7.29	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.22	
Crop insurance		19	bu	$8.47	
Hail insurance		7.2	%	$12.25	
Hired labour		1	hr/ac	$19.80	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$7.57	
Total Cash Costs				**$344.12**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$616.62**	
Returns			**AVG**	**Target**	
Yield bu/ac			30	40	
Price $/bu				$17.20	
Gross			**$516**	**$688**	
Net Return			**-$101**	**$71**	
Specialized equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$15.42**	
Break Even Yield			bu/ac	**36**	

AGRONOMICS

Variety Selection

Select an early maturing variety. Soybean maturity is determined by photosensitivity and the earliest maturing type is considered a **000** variety, which is most suitable for Saskatchewan. Be aware when comparing varieties that not all companies classify varieties the same in relative maturity. Refer to the ICDC ***2023 Crop Varieties for Irrigation*** guide for production data specific to irrigation in Saskatchewan.

Seeding

Plant population 45 plants/sq. m.
TKW is variety-specific; adjust seeding rate accordingly.
Soil temperature needs to be at least 10°C. Seeding after maximum daytime temperature has been reached is recommended until after mid-May. Roll after seeding.

Fertilization

- *Inoculant*—Soybean requires a specific species of rhizobia not native to Saskatchewan soil. Double inoculation is recommended on new fields. Most varieties come pre-treated and pre-liquid inoculated. Addition of second inoculant of granular or peat is recommended.
- *Nitrogen*—Soybean is 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 P_2O_5 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 soybeans from 10–13% moisture. 5% green and 15% splits and cracks are the maximum grading factors before deductions.

Rotations and Crop Protection

Soybeans fit into rotation similar to any pulse crop. Most soybean varieties are glyphosate tolerant. Seed treatment is a must in our cooler soil, with soybeans being affected by pythium, rhizoctonia, and fusarium root rots. Soybean is 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.irrigationsaskatchewan.com.

Flax

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$24.80	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	100	lb	$118.36	
	P_2O_5	35	lb	$36.37	
	K_2O	0	lb	$0.00	
Herbicide				$56.47	
Insecticide				$2.43	
Fungicide				$14.60	
Equipment fuel				$29.81	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		5.0	inches	$10.42	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.66	
Crop insurance		34	bu/ac	$17.50	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$21.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$9.81	
Total Cash Costs				**$455.90**	
Farm Equipment & Buildings				$92.49	
Irrigation System				$40.01	
Specialized Equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$718.39**	
Returns			**AVG**	**Target**	
Yield bu/ac			40	50	
Price $/bu				$18.50	
Gross			**$740**	**$925**	
Net Return			**$158**	**$345**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$14.37**	
Break Even Yield			bu/ac	**39**	

AGRONOMICS

Variety Selection

Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Use certified seed or seed must be tested to be deemed free of GMO flax.

Seeding

Plant population	500	plants/sq. m.
TKW	5	grams
Seeding Rate	40	lb/ac

Early May seeding produces the 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 P_2O_5.
A soil test will provide recommendations for fertilizer application based on soil nutrient levels and crop needs.
Flax seed is highly sensitive to seed placed phosphate. If soil test recommendations are higher, apply additional phosphate away from the seed or with the crop prior to seeding flax.

Crop Water Use and Irrigation

- Total seasonal crop water use: 350–450 mm; avg. 372 mm ⁂
- Seedling: 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. Direct harvest below 10% moisture for safe storage.

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. 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. An application of fungicide is recommended to control pasmo.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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.

Pea

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$59.40	
Seed treatment/inoculant				$55.44	
Soil test				$1.00	
Fertilizer:	N	0	lb	$0.00	
	P_2O_5	30	lb	$31.17	
	K_2O	0	lb	$0.00	
Herbicide				$70.01	
Insecticide				$8.40	
Fungicide				$14.60	
Equipment fuel				$33.31	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		3.5	inches	$7.29	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.22	
Crop insurance		46	bu/ac	$14.08	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$20.75	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$9.40	
Total Cash Costs				**$427.24**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$699.74**	
Returns			**AVG**	**Target**	
Yield bu/ac			55	75	
Price $/bu (#2 or better yellow)				$13.00	
Gross			**$715**	**$975**	
Net Return			**$15**	**$275**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$9.33**	
Break Even Yield			bu/ac	**54**	

AGRONOMICS

Variety Selection

High-yielding, lodging resistant varieties are recommended for irrigation. Please refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	80	plants/sq. m.
TKW	240	grams
Seeding Rate	180	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 P_2O_5. Use a soil test for field-specific fertilizer application based on soil nutrient levels and crop needs. Peas have strong association with mycorrhizae to supplement phosphate 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

Desiccate when lower pods are tan and seeds rattle. Direct harvest at 16-18% moisture and aerate, to prevent seed damage. Harvest when the peas are mature to avoid wind damage.

Handling, Storage, and Grading

Dry 16 %; Tough 16.1%; Damp 18.0%

Rotations and Crop Protection

Three years between pea crops. Check re-cropping restrictions on Group 2 and Group 4 herbicides. Irrigated pea yields have declined in recent years due to increased root rot disease. Peas are the most sensitive pulse to the root rot pathogen Aphanomyces. Soil testing for Aphanomyces is recommended before seeding peas. Positive results lead to a recommendation of 6-10 year absence of peas and lentils in the rotation. No seed treatment is registered for control of Aphanomyces.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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.

Faba Bean

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$72.00	
Seed treatment / inoculant				$29.70	
Soil test				$1.00	
Fertilizer:	N	0	lb	$0.00	
	P_2O_5	40	lb	$41.56	
	K_2O	0	lb	$0.00	
Herbicide				$88.64	
Insecticide				$8.40	
Fungicide				$14.60	
Equipment fuel				$30.86	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		8.0	inches	$16.67	
Irrigation repair				$16.92	
Irrigation service/water charge				$50.35	
Crop insurance		2584	lb/ac	$13.91	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$20.25	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$9.93	
Total Cash Costs				**$451.22**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$723.72**	
Returns			**AVG**	**Target**	
Yield lb/ac			2400	3600	
Price $/lb				$0.23	
Gross			**$552**	**$828**	
Net Return			**-$172**	**$104**	
Specialized equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/lb	**$0.20**	
Break Even Yield			lb/ac	**3147**	

AGRONOMICS

Variety Selection

Marketing prospects should guide variety choice. Please refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	40 plants/sq. m.
TKW	440 grams
Seeding Rate	180 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 up to 40lb/ac P_2O_5. 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

Desiccation and straight cut harvest when seed moisture is 16–18% and aerate to prevent seed damage.
Swath when 25% of plants have lower pods turning black, or September 7, or whichever occurs first. Lay down a light swath, as swaths take a long time to dry. 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

Allow two years between faba bean and another pulse crop. Check re-cropping restrictions on Group 2 (Ally, Everest, and 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. Fungicide application is recommended for disease suppression.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *Irrigation Scheduling Manual*

More Information

Call an Irrigation Agrologist at (306) 867-5500 or check our website: www.irrigationsaskatchewan.com. Use the pulse production manuals from The Saskatchewan Pulse Growers Association.

Red Lentil

ECONOMICS

ITEM	#	UNIT	$/ac	My Farm $/ac
Seed			$25.85	
Seed treatment / inoculant			$29.65	
Soil test			$1.00	
Fertilizer: N	0	lb	$0.00	
P_2O_5	30	lb	$31.17	
K_2O	0	lb	$0.00	
Herbicide			$62.46	
Insecticide			$8.40	
Fungicide			$19.70	
Equipment fuel			$33.31	
Equipment repair			$10.15	
Custom work			$0.00	
Irrigation power	3.5	inches	$7.29	
Irrigation repair			$16.92	
Irrigation service/water charge			$49.22	
Crop insurance	1955	lb/ac	$23.02	
Hail insurance			$12.25	
Hired labour	0	hr/ac	$0.00	
Other			$0.00	
Farm overhead			$13.85	
Operating interest	4.5	%	$7.75	
Total Cash Costs			**$351.98**	
Farm equipment & buildings			$92.49	
Irrigation system			$40.01	
Specialized equipment			$0.00	
Land			$140.00	
Total Non-Cash Costs			**$272.50**	
Total Costs			**$624.48**	
Returns		**AVG**	**Target**	
Yield lb/ac		2000	2400	
Price $/lb (#2 or better small red)			$0.33	
Gross		**$660**	**$792**	
Net Return		**$36**	**$168**	
Specialized equipment			$/ac/yr	
TOTAL			$0.00	
Break Even using Target Returns & Total Costs				
Break Even Price		$/ac	**$0.26**	
Break Even Yield		lb/ac	**192**	

AGRONOMICS

Variety Selection

Red lentil varieties have not been evaluated under irrigation. Clearfield (CL) varieties are recommended for superior weed control. CDC Maxim CL is the most widely grown and highest yielding small red lentil variety. Choose a variety with determinate growth habit.

Seeding

Plant population	120	plants/sq. m.
TKW	40	grams
Seeding Rate	55	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 P_2O_5. Use a soil test for field-specific fertilizer application based on soil nutrient levels and crop needs. Lentil has a strong association with mycorrhizae to supplement phosphate 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. Direct harvest below 14-16% 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:

Allow three years between lentil crops. Check re-cropping restrictions on Group 2 and Group 4 herbicides. Control the spread of disease with fungicide application. Lentils are highly sensitive to the root rot pathogen Aphanomyces. Soil testing for Aphanomyces is recommended before seeding lentils. Positive results lead to a recommendation of 6-10 year absence of peas and lentils in the rotation. No seed treatment is registered for control of Aphanomyces.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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. Also refer to Saskatchewan Pulse Growers website at www.saskpulse.com.

Dry Bean—Pinto

ECONOMICS

ITEM	#	UNIT	$/ac	My Farm $/ac
Seed			$84.75	
Seed treatment / inoculant			$0.00	
Soil test			$1.00	
Fertilizer: * N	60	lb	$71.02	
P_2O_5	40	lb	$41.56	
K_2O	0	lb	40.00	
Herbicide			$82.59	
Insecticide			$0.00	
Fungicide			$17.80	
Equipment fuel			$26.65	
Equipment repair			$10.15	
Custom work			$0.00	
Irrigation power	3.4	inches	$7.08	
Irrigation repair			$16.92	
Irrigation service/water charge			$49.19	
Crop insurance	1916	lb/ac	$36.12	
Hail insurance			$12.25	
Hired labour	1	hr/ac	$24.50	
Other			$0.00	
Farm overhead			$13.85	
Operating interest	4.5	%	$11.15	
Total Cash Costs			**$506.58**	
Farm equipment & buildings			$92.49	
Irrigation system			$40.01	
Specialized equipment			$40.01	
Land			$140.00	
Total Non-Cash Costs			**$313.41**	
Total Costs			**$819.99**	
Returns		**AVG**	**Target**	
Yield lb/ac		2700	3000	
Price $/lb			$0.48	
Gross		**$1,296**	**$1,440**	
Net Return		**$476**	**$620**	
Specialized equipment ($/ac/yr)		Custom	Own	
Planter		$19.00	$5.04	
Row Crop Cultivator		$24.00	$2.11	
Undercutter		$20.00	$3.35	
Dry Bean Combine			$27.90	
10" Belt Conveyor			$2.53	
Combine		$34.00		
TOTAL		**$97.00**	**$40.93**	
Break Even Price		**$/lb**	**$0.27**	
Break Even Yield		**Lb/ac**	**1708**	

AGRONOMICS

Variety Selection

Choose an indeterminate short vine-type plant for irrigated production. Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

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

Row crop equipment is required.

Seed after the danger of frost: May 20-25th.

Seed weights vary with each market class and seed lot.

Fertilization

Inoculate with a dry bean inoculant. Apply 50–60 lb/ac N and 30–40 lb/ac P_2O_5. 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. Use a soil probe to check moisture status. †

Harvest

Undercut when 40% of pods are buckskin in 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 re-cropping 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 AC Island, and treat 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 Canada-Saskatchewan Irrigation Diversification Centre *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. Use the pulse production manuals from The Saskatchewan Pulse Growers Association.

Dry Bean—Black

ECONOMICS

ITEM	#	UNIT	$/ac	My Farm $/ac
Seed			$68.75	
Seed treatment / inoculant			$0.00	
Soil test			$1.00	
Fertilizer: * N	60	lb	$71.02	
P_2O_5	40	lb	$41.56	
K_2O	0	lb	$0.00	
Herbicide			$82.59	
Insecticide			$0.00	
Fungicide			$17.80	
Equipment fuel			$26.65	
Equipment repair			$10.15	
Custom work			$0.00	
Irrigation power	3.4	inches	$7.08	
Irrigation repair			$16.92	
Irrigation service/water charge			$49.19	
Crop insurance	1340	lb/ac	$24.88	
Hail insurance			$12.25	
Hired labour	1	hr/ac	$24.50	
Other			$0.00	
Farm overhead			$13.85	
Operating interest	4.5	%	$10.53	
Total Cash Costs			**$478.73**	
Farm equipment & buildings			$92.49	
Irrigation system			$40.01	
Specialized equipment			$40.91	
Land			$140.00	
Total Non-Cash Costs			**$313.41**	
Total Costs			**$792.14**	
Returns		**AVG**	**Target**	
Yield lb/ac		2700	3000	
Price $/lb			$0.50	
Gross		**$1,350**	**$1,500**	
Net Return		**$588**	**$708**	
Specialized equipment ($/ac/yr)		Custom	Own	
Planter		$19.00	$5.04	
Row Crop Cultivator		$24.00	$2.11	
Undercutter		$20.00	$3.35	
Dry Bean Combine			$27.90	
10" Belt Conveyor			$2.53	
Combine		$34.00		
TOTAL		**$97.00**	**$40.93**	
Break Even Price		$/lb	$0.26	
Break Even Yield		lb/ac	1584	

AGRONOMICS

Variety Selection

Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	11000 plants/ac
TKW	250 grams
Seeding Rate	55 lb/ac

Row crop equipment is recommended. Narrow row solid seeded production has potential with caution around seed damage taken during seeding with an air seeder delivery system.

Seed after the danger of frost: May 20-25th.

Seed weights vary with each market class and seed lot.

Fertilization

Inoculate with a dry bean inoculant. Apply 50–60 lb/ac N and 30–40 lb/ac P_2O_5. 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. Use a soil probe to check moisture status. †

Harvest

Undercut when 40% of pods are buckskin in 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 re-cropping 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 CDC Blackstrap, and treat 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 Canada-Saskatchewan Irrigation Diversification Centre *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. Use the pulse production manuals from The Saskatchewan Pulse Growers Association.

Dry Bean Solid Seeded

ECONOMICS

ITEM	#	UNIT	$/ac	My Farm $/ac
Seed			$68.75	
Seed treatment / inoculant			$0.00	
Soil test			$1.00	
Fertilizer: * N	60	lb	$71.02	
P_2O_5	40	lb	$41.56	
K_2O	0	lb	$0.00	
Herbicide			$82.59	
Insecticide			$0.00	
Fungicide			$17.80	
Equipment fuel			$26.65	
Equipment repair			$10.15	
Custom work			$0.00	
Irrigation power	3.4	inches	$7.08	
Irrigation repair			$16.92	
Irrigation service/water charge			$49.19	
Crop insurance	1340	lb/ac	$24.88	
Hail insurance			$12.25	
Hired labour	1	hr/ac	$24.50	
Other			$0.00	
Farm overhead			$13.85	
Operating interest	4.5	%	$10.53	
Total Cash Costs			**$478.73**	
Farm equipment & buildings			$92.49	
Irrigation system			$40.01	
Specialized equipment			$30.42	
Land			$140.00	
Total Non-Cash Costs			**$302.92**	
Total Costs			**$781.65**	
Returns		**AVG**	**Target**	
Yield lb/ac		2700	3000	
Price $/lb			$0.50	
Gross		**$1,350**	**$1,500**	
Net Return		**$568**	**$718**	
Specialized equipment ($/ac/yr)		Custom	Own	
Planter				
Row Crop Cultivator				
Undercutter				
Dry Bean Combine			$27.90	
10" Belt Conveyor			$2.53	
TOTAL			**$30.43**	
Break Even Price		$/lb	$0.26	
Break Even Yield		Lb/ac	1563	

AGRONOMICS

Variety Selection

Refer to the ICDC ***2023 Crop Varieties for Irrigation*** publication for information on variety performance. Physical copies can be obtained at CSIDC or at the Ministry of Agriculture office in Outlook. It is also available on ICDC's website.

Seeding

Plant population	1100 plants/ac
TKW	250 grams
Seeding Rate	55 lb/ac

It is recommended to land roll immediately after seeding when narrow row solid seeding. Take caution around seed damage inflicted during seeding with an air seeder delivery system.

Seed after the danger of frost: May 20-25th.

Seed weights vary with each market class and seed lot.

Fertilization

Inoculate with a dry bean inoculant. Apply 50–60 lb/ac N and 30–40 lb/ac P_2O_5. 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. Use a soil probe to check moisture status. †

Harvest

Swath when buckskin stage in colour and leaves are still attached. If straight cutting, apply Reglone at the buckskin Stage. 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 re-cropping 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 CDC Blackstrap, and treat 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 Canada-Saskatchewan Irrigation Diversification Centre *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. Use the pulse production manuals from The Saskatchewan Pulse Growers Association.

Winter Wheat

ECONOMICS

Item			UNIT	$/ac	My Farm $/ac
Seed				$33.00	
Seed treatment				$8.12	
Soil test				$1.00	
Fertilizer:	N	135	lb	$159.79	
	P_2O_5	45	lb	$46.76	
	K_2O	15	lb	$12.07	
Herbicide				$64.90	
Insecticide *				$12.90	
Fungicide				$7.76	
Equipment fuel				$29.81	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		7.0	inches	$14.58	
Irrigation repair				$16.92	
Irrigation service/water charge				$50.24	
Crop insurance		48	bu/ac	$13.40	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$0.00	
Other				$13.85	
Farm overhead				$11.95	
Operating interest		4.5	%	$11.95	
Total Cash Costs				**$542.95**	
Farm Equipment & Buildings				$92.49	
Irrigation System				$40.01	
Specialized Equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$815.45**	
Returns			**AVG**	**Target**	
Yield bu/ac			80	100	
Price $/bu				$9.97	
Gross Return			**$793**	**$991**	
Net Return			**-$23**	**$176**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$8.15**	
Break Even Yield			bu/ac	**82**	

AGRONOMICS

Variety Selection

Choose high-yielding varieties with very good lodging ratings. Winter Wheat varieties have been evaluated at CSIDC and results are available in previous *ICDC Research and Demonstration Final Reports*. Please contact ICDC for more info.

Seeding

Plant population	250 plants/sq. m.
TKW	33 grams
Seeding Rate	110 lb/ac

Seed between September 1st to 15th.

Fertilization

Apply 135 lb/ac N and 45 lb/ac P_2O_5. 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 estimate: 300–400 mm
  - Emergence to Tillering estimate: 1.0 to 4.5 mm/day
- Stem Extension to Heading estimate: 3.5 increasing to 6.5 mm/day
- Flowering to Late Milk estimate: 5. to 7.5 mm/day
- Early Dough to Maturity estimate: 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. Direct harvest below 14.5% moisture for safe storage.

Handling, Storage, and Grading

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection

Fungicide seed treatment recommended. A four year break between Wheat crops reduces risk and build-up of disease. Seeding on abroad leaf stubble is advantages to seeding on cereal stubble. Good winter survival will help prevent disease pressure.

* Wheat midge may require control.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *Irrigation Scheduling Manual*

More Information

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

Hybrid Fall Rye

ECONOMICS

Item			UNIT	$/ac	My Farm $/ac
Seed				$47.25	
Seed treatment				$9.10	
Soil test				$1.00	
Fertilizer:	N	150	lb	$177.54	
	P_2O_5	45	lb	$46.76	
	K_2O	15	lb	$12.07	
Herbicide				$35.38	
Insecticide *				$12.90	
Fungicide				$0.00	
Equipment fuel				$29.81	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		7.0	inches	$14.58	
Irrigation repair				$16.92	
Irrigation service/water charge				$50.24	
Crop insurance		39	bu/ac	$16.86	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$23.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$11.93	
Total Cash Costs				**$542.09**	
Farm Equipment & Buildings				$92.49	
Irrigation System				$40.01	
Specialized Equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$814.59**	
Returns			**AVG**	**Target**	
Yield bu/ac			100	120	
Price $/bu (#1 13.5%)				$7.92	
Gross Return			**$792**	**$950**	
Net Return			**-$23**	**$136**	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$6.79**	
Break Even Yield			bu/ac	**103**	

AGRONOMICS

Variety Selection

Choose high-yielding varieties with very good lodging ratings. Hybrid Rye varieties have been evaluated at CSIDC and results are available in previous *ICDC Research and Demonstration Final Reports*. Please contact ICDC for more info.

Seeding

Plant population	250 plants/sq. m.
TKW	31 grams
Seeding Rate	0.8 bag/ac

Seed between September 1st and 15th.

Fertilization

Apply 140–165 lb/ac N and 30–40 lb/ac P_2O_5. 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 estimate: 300–400 mm
  - Emergence to Tillering estimate: 1.0 to 4.5 mm/day
- Stem Extension to Heading estimate: 3.5 increasing to 6.5 mm/day
- Flowering to Late Milk estimate: 5. to 7.5 mm/day
- Early Dough to Maturity estimate: 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. Direct harvest below 14.5% moisture for safe storage.

Handling, Storage, and Grading

Dry 14.5%; Tough 14.6%; Damp 17.0%

Rotations and Crop Protection

Fungicide seed treatment recommended. A four year break between rye crops reduces risk and build-up of disease. Seeding on abroad leaf stubble is advantages to seeding on cereal stubble. Good winter survival will help prevent ergot pressure.

* Wheat midge may require control.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *Irrigation Scheduling Manual*

More Information

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

Quinoa

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$63.00	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	150	lb	$177.54	
	P_2O_5	40	lb	$41.56	
	K_2O	15	lb	$12.07	
Herbicide				$14.26	
Insecticide *				$6.13	
Fungicide				$0.00	
Equipment fuel				$23.85	
Equipment repair				$10.15	
Custom work				$0.00	
Irrigation power		6.0	inches	$12.50	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.95	
Crop insurance		0	lb/ac	$20.93	
Hail insurance				$0.00	
Hired labour		1	hr/ac	$13.58	
Other				$11.16	
Farm overhead				$13.85	
Operating Interest		4.5	%	$11.16	
Total Cash Costs				**$507.37**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$779.87**	
Returns			**AVG**	**Target**	
Yield lb/ac			1000*	2000*	
Price $/bu (#1 CWSWS)				$0.90	
Gross			**$900***	**$1,800***	
Net Return			**$120***	**$1,020***	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/lb	**$0.39**	
Break Even Yield			bu/ac	**867**	

AGRONOMICS

Variety Selection

Northern Quinoa's variety "Golden" has been bred for Saskatchewan conditions. Other varieties are available although not commonly grown in Saskatchewan

Seeding

Plant population	165	plants/sq. m.
TKW	NA	grams
Seeding Rate	10	lb/ac

Seed before May 20th.

Fertilization

Apply 150 lb/ac N, 40 lb/ac P_2O_5 and 10–15 lb/ac K_2O. 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 is estimated to be around 375 mm

Harvest

Straight cutting is recommended when crop dries down. Quinoa grain is very susceptible to sprouting which is more of a risk when the crop is swathed. Quinoa is considered dry at 10% moisture on the canola chart.

Handling, Storage, and Grading

Dry- 10%; Tough >10%

Rotations and Crop Protection

No pesticides have been registered in Canada for quinoa at this time. Quinoa is susceptible to a wide range of pests and crop can be completely wiped out by stem borer. Avoid growing on canola stubble as volunteers are very difficult to remove. Proper burn off is crucial due to quinoa being a poor competitor to weeds.

More Information

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

*This is a new crop and high risk should be considered when growing this on your operation.

Hemp

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$66.00	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	135	lb	$159.79	
	P_2O_5	45	lb	$46.76	
	K_2O	15	lb	$12.07	
Herbicide				$9.01	
Insecticide				$0.00	
Fungicide				$0.00	
Equipment fuel				$16.09	
Equipment repair				$11.49	
Custom work				$0.00	
Irrigation power		11.0	inches	$22.92	
Irrigation repair				$16.92	
Irrigation service/water charge				$51.41	
Crop insurance		606	lb/ac	$23.61	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$20.25	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$10.88	
Total Cash Costs				**$494.29**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$766.79**	
Returns			**AVG**	**Target**	
Yield lb/ac			890	2000	
Price $/lb				$0.90	
Gross			**$801***	**$1,800***	
Net Return			**$34***	**$1,03***	
Specialized Equipment				$/ac/yr	
TOTAL				$0.00	
Break Even using Target Returns & Total Costs					
Break Even Price			$/lb	**$0.38**	
Break Even Yield			lb/ac	**852**	

AGRONOMICS

Variety Selection

Hemp varieties have been evaluated at CSIDC and results are available in previous *ICDC Research and Demonstration Final Reports*. Please contact ICDC for more info.

Seeding

Plant population	125	plants/sq. m
TKW	18	grams
Seeding Rate	30	lb/ac

Seeding date between May 15th and June 30th will be determined by planned harvest window. Hemp can reach maturity in a little as 80 days.

Fertilization

Apply 135 lb/ac N, 45 lb/ac P_2O_5, and 15–20 lb/ac K_2O. A soil test will provide field specific recommendations for fertilizer application based on soil nutrient levels and crop needs.

Crop Water Use and Irrigation

- Total seasonal crop water use: up to 500 mm

Harvest

Straight combining is done prior to seed shattering, and normally when the grain is at 12-20% moisture depending on variety. If swathing is the only method available, cut no later than 85% maturity to avoid shattering. The more hemp matures and dries, the tougher the fibres become, making it more difficult to thresh. This crop is prone to sprouting after rains when mature.

Handling, Storage, and Grading

Hemp is an oilseed crop and must be stored in a similar method to other oilseeds to avoid spoilage. Grain may be harvested as high as 20% moisture but must be dried to less than 9% moisture for safe storage.

Rotations and Crop Protection

Avoid seeding hemp on wheat, spice crops and buckwheat stubble. Wheat and buckwheat seed are difficult to clean out of hemp seed, while spice and herb crops may introduce unfavourable flavours to hemp oil. Hemp does well on fields previously under alfalfa or on green-manured fields where fertility is high, and weeds are under control.

There are no pesticide products registered for his crop at this time.

More Information

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

*This is a new crop and high risk should be considered when growing this on your operation.

Corn—Grain

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$97.92	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	165	lb	$195.30	
	P_2O_5	35	lb	$36.37	
	K_2O	15	lb	$12.07	
Herbicide				$31.73	
Insecticide				$8.40	
Fungicide				$0.00	
Equipment fuel				$33.31	
Equipment repair				$12.76	
Custom work (grain dryer)				$33.00	
Irrigation power		5		$10.83	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.72	
Crop insurance				$9.07	
Hail insurance				$12.25	
Hired labour		1	hr/ac	$58.71	
Farm overhead				$13.85	
Operating interest		4.5	%	$14.25	
Total Cash Costs				**$647.45**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$15.02	
Land				$140.00	
Total Non-Cash Costs				**$287.52**	
Total Costs				**$934.97**	
Returns			**AVG**	**Target**	
Yield bu/ac			100	150	
Price $/bu				$8.17	
Gross			**$87**	**$1,226**	
Net Return			**-$118**	**$291**	
Specialized equipment				$/ac/yr	
Planter				$5.04	
Corn header				$9.99	
TOTAL				$15.03	
Break Even using Target Returns & Total Costs					
Break Even Price			$/ac	**$6.23**	
Break Even Yield			bu/ac	**114**	

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 grams
Seeding Rate	32,000 plants/ac

Fertilization

Apply 150–180 lb/ac N, 35–40 lb/ac P_2O_5, and 10–15 lb/ac K_2O. Spring banding of fertilizer prior to seeding is recommended. Soil testing, including micronutrients, is recommended every 5 to 10 years. Fertility rates have not been established for Saskatchewan growing conditions.

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

Grain corn can be combined at < 30% moisture with more cracking but aim for < 20%. Safe storage is 14–15%.

Handling, Storage, and Grading

Drying costs are based on $33/ac. 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 Canada-Saskatchewan Irrigation Diversification Centre *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.

Corn—Grazing

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$102.72	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	165	lb	$195.30	
	P_2O_5	35	lb	$36.37	
	K_2O	15	lb	$12.07	
Herbicide				$31.73	
Insecticide				$6.08	
Fungicide				$0.00	
Equipment fuel				$6.34	
Equipment repair				$5.50	
Custom work				$0.00	
Irrigation power		5	inches	$10.83	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.72	
Crop insurance				$0.00	
Hail insurance				$0.00	
Hired labour		20	hr/ac	$27.00	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$11.60	
Total Cash Costs				**$527.02**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$13.55	
Land				$140.00	
Total Non-Cash Costs				**$286.05**	
Total Costs				**$813.08**	

Specialized Equipment	$/ac/yr	
Planter	$5.04	
Cross Fence	$1.16	
Perimeter Fencing	$4.28	
Water Supply	$3.09	
TOTAL	$13.56	

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 grams
Seeding Rate	32,000 plants/ac

Fertilization

Apply 150–180 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. Fertility rates have not been established for Saskatchewan growing conditions.

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 Canada-Saskatchewan Irrigation Diversification Centre *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.

Corn—Silage

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$102.72	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	165	lb	$195.30	
	P_2O_5	35	lb	$36.37	
	K_2O	15	lb	$12.07	
Herbicide				$31.73	
Insecticide				$6.08	
Fungicide				$0.00	
Equipment fuel				$33.31	
Equipment repair				$5.50	
Custom work (silage)				$288.00	
Irrigation power		5	inches	$10.83	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.71	
Crop insurance				$0.00	
Hail insurance				$0.00	
Hired labour		1	hr/ac	$58.71	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$19.40	
Total Cash Costs				**$881.50**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$5.04	
Land				$140.00	
Total Non-Cash Costs				**$277.54**	
Total Costs				**$1,159.4**	

Returns	AVG	Target	
Yield MT/ac @ 65% moisture	16	24	
Price $/MT *		$36	
Gross Return	**$576**	**$864**	
Net Return	**-$583**	**-$295**	

Specialized equipment	$/ac/yr	
Planter	$5.04	
TOTAL	**$5.04**	

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 grams
Seeding Rate	32,000 plants/ac

Fertilization

Spring banding of fertilizer prior to seeding is recommended. Apply 150–180 lb/ac N, 35–40 lb/ac P_2O_5, and 10–15 lb/ac K_2O. Soil testing, including micronutrients, is recommended every 5 to 10 years. Fertility rates have not been established for Saskatchewan growing conditions.

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 is adjusted to 65% moisture of corn. Silage per tonne is based on the feed barley grain price times 11.
Custom silaging, including silage harvesting, trucking, and packaging is based on $12/tonne.

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 Canada-Saskatchewan Irrigation Diversification Centre *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.

Cereal—Silage

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$41.60	
Seed treatment				$6.60	
Soil test				$1.00	
Fertilizer:	N	90	lb	$106.53	
	P_2O_5	35	lb	$36.37	
	K_2O	15	lb	$12.07	
Herbicide				$21.61	
Insecticide				$0.00	
Fungicide*				$0.00	
Equipment fuel				$6.16	
Equipment repair				$5.50	
Custom work (silage)				$168.00	
Irrigation power		3	inches	$6.25	
Irrigation repair				$16.92	
Irrigation service/water charge				$49.08	
Crop insurance				$0.00	
Hail insurance				$0.00	
Hired labour		1	hr/ac	$23.50	
Other				$0.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$11.59	
Total Cash Costs				**$526.62**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$0.00	
Land				$140.00	
Total Non-Cash Costs				**$272.50**	
Total Costs				**$799.12**	
Returns			**AVG**	**Target**	
Yield MT/ac @ 65% moisture			12	14	
Price $/MT *				$36	
Gross Return			**$432**	**$504**	
Net Return			**-$367**	**-$295**	

AGRONOMICS

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 the ICDC ***2023 Crop Varieties for Irrigation***. Talk to your local forage specialist on forage varieties.

Seeding

Plant population	320 plants/sq. m.
TKW	41 grams
Seeding Rate	130 lb/ac

Fertilization

Apply 90 N/ac, 35 P_2O_5/ac, and 15 K_2O/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.

Custom silaging, including silage harvesting, trucking, and packing is based on $12/tonne.

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. Cereal silage may require an application of fungicide to control leaf disease.

* Value very dependent on location and market need.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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.

Seedling Alfalfa (no cover crop)

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed (c/w inoculant)				$49.50	
Seed treatment				$0.00	
Soil test				$1.00	
Fertilizer:	N	0	lb	$0.00	
	P_2O_5	100	lb	$103.90	
	K_2O	40	lb	$32.20	
Herbicide				$5.25	
Insecticide				$0.00	
Fungicide				$0.00	
Equipment fuel				$13.86	
Equipment repair				$5.00	
Custom work				$0.00	
Irrigation power		9.8	inches	$20.42	
Irrigation repair				$16.92	
Irrigation service/water charge				$51.06	
Crop insurance				$6.97	
Hail insurance				$0.00	
Hired labour		1	hr/ac	$24.50	
Other				$4.50	
Farm overhead				$13.85	
Operating interest		4.5	%	$7.85	
Total Cash Costs				**$356.77**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$13.64	
Land				$140.00	
Total Non-Cash Costs				**$286.14**	
Total Costs				**$642.91**	
Returns			**AVG**	**Target**	
Yield MT/ac			2.0	2.5	
Price $/MT				$70	
Gross Return			**$400**	**$500**	
Net Return			**-$243**	**-$143**	
Specialized equipment				$/ac/yr	
Mower/condition				$5.52	
Round baler				$4.54	
Hay rake (21–30 ft wheal)				$1.70	
Bale mover				$1.89	
TOTAL				**$13.64**	

AGRONOMICS

Variety Selection

Select a variety that exhibits rapid re-growth, good winter hardiness, and disease resistance. Refer to the ICDC ***2023 Crop Varieties for Irrigation*** for yield data on 50 different varieties. Talk to your local Livestock and Feed Extension Specialist for forage variety information.

Seeding

Plant population	30 to 40 plants/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:

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

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 (15mm) 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 Canada-Saskatchewan Irrigation Diversification Centre *Irrigation Scheduling Manual*

More Information

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

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_2O_5	50	lb	$51.95	
	K_2O	50	lb	$40.25	
Herbicide				$0.00	
Insecticide				$0.00	
Fungicide				$0.00	
Equipment fuel				$11.55	
Equipment repair				$5.37	
Custom work				$0.00	
Irrigation power		8	inches	$15.63	
Irrigation repair				$16.92	
Irrigation service/water charge				$50.39	
Crop insurance				$5.44	
Hail insurance				$0.00	
Hired labour		1	hr/ac	$24.50	
Other				$6.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$5.46	
Total Cash Costs				**$248.30**	
Farm equipment & buildings				$534.44	
Irrigation system				$40.01	
Specialized equipment				$13.64	
Land				$87.50	
Total Non-Cash Costs				**$209.27**	
Total Costs				**$433.88**	
Returns			**AVG**	**Target**	
Yield MT/ac*			3.0	4.0	
Price $/MT				$85	
Gross Return			**$255**	**$340**	
Net Return			**-$279**	**-`$94**	
Specialized equipment				$/ac/yr	
Mower/condition				$5.52	
Round baler				$4.54	
Hay rake (21-30 ft wheel)				$1.70	
Bale mover				$1.89	
TOTAL				**$13.64**	

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 in large amounts prior to establishment. Fertilizer application is optimized with a disc bander or dribble band compared to 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:
  - 9 mm/day before first cut
  - 8 mm/day before 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 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 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 Canada-Saskatchewan Irrigation Diversification Centre *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.

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_2O_5	50	lb	$51.95	
	K_2O	50	lb	$40.25	
Herbicide				$0.00	
Insecticide				$0.00	
Fungicide				$0.00	
Equipment fuel				$17.25	
Equipment repair				$8.06	
Custom work				$0.00	
Irrigation power		8	inches	$15.63	
Irrigation repair				$16.92	
Irrigation service/water charge				$50.39	
Crop insurance				$5.44	
Hail insurance				$0.00	
Hired labour		1	hr/ac	$24.50	
Other				$7.50	
Farm overhead				$13.85	
Operating interest		4.5	%	$5.69	
Total Cash Costs				**$258.51**	
Farm equipment & buildings				$92.49	
Irrigation system				$40.01	
Specialized equipment				$22.71	
Land				$140.00	
Total Non-Cash Costs				**$295.21**	
Total Cost				**$553.72**	
Returns			**AVG**	**Target**	
Yield MT/ac *			4.0	5.0	
Price $/MT				$100	
Gross Return			**$400**	**$500**	
Net Return			**-$145**	**-$54**	
Specialized equipment				$/ac/yr	
Mower/condition				$9.18	
Round baler				$7.56	
Hay rake (21–30 ft wheel)				$2.82	
Bale mover				$3.14	
TOTAL				$22.71	

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. Applying fertilizer with disc bander or dribble band is optimal compared to 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 Canada-Saskatchewan Irrigation Diversification Centre *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.

Seed Potato (Norland Elite II variety)

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$819.00	
Seed treatment/inoculant				$86.45	
Soil test				$1.00	
Fertilizer:	N	105	lb	$124.28	
	P_2O_5	60	lb	$62.34	
	K_2O	30	lb	$24.15	
Herbicide				$48.00	
Insecticide				$16.93	
Fungicide				$156.04	
Equipment fuel				$121.59	
Equipment repair				$75.00	
Custom work				$80.00	
Irrigation power		6	inches	$12.50	
Irrigation repair *				$0.00	
Irrigation service/water charge *				$0.00	
Crop insurance		11	tons/ac	$158.36	
Hail insurance				$0.00	
Hired labour		15	hr/ac	$405.00	
Inspection Fees & Testing				$120.00	
Storage O & M				$71.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$53.90	
Total Cash Costs				**$2,449.38**	
Farm equipment & buildings				$40.06	
Irrigation system*				$0.00	
Specialized equipment				$310.90	
Land rental rate				$295.00	
Total Non-Cash Costs				**$645.96**	
Total Costs				**$3,095.35**	
Returns			**AVG**	**Target**	
Yield ton/ac			12	14	
Price $/ton				$630	
Gross Return			**$7,560**	**$8,820**	
Net Return			**$4,264.65**	**$5,725**	
Specialized equipment				$/ac/yr	
Potato field equipment				$130.25	
Potato handling equipment				$60.12	
Potato storage facility				$120.43	
TOTAL				$310.90	

* 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	21,780 plants/acre
Weight of Seed Piece	60 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 P_2O_5, and 20–30 lb/ac K_2O.

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 skin set and mature tubers, control tuber size, and 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 landowner's responsibility to disclose herbicide use, including spot usage for perennial weed control. When in doubt, consult a potato specialist.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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.

Table Potato (Norland Variety)

ECONOMICS

ITEM	#	UNIT	$/ac	My Farm $/ac
Seed			$477.00	
Seed treatment/inoculant			$59.85	
Soil test			$1.00	
Fertilizer: N	135	lb	$124.28	
P_2O_5	60	lb	$62.34	
K_2O	30	lb	$24.15	
Herbicide			$48.00	
Insecticide			$16,93	
Fungicide			$200.00	
Equipment fuel			$156.04	
Equipment repair			$124.96	
Custom work			$80.00	
Irrigation power	6	inches	$12.50	
Irrigation repair *			$0.00	
Irrigation service/water charge *			$0.00	
Crop insurance	11	tons/ac	$121.99	
Hail insurance			$0.00	
Hired labour	15	hr/ac	$405.00	
Other			$0.00	
Storage O & M			$71.00	
Farm overhead			$13.85	
Operating interest	4.5	%	$42.16	
Total Cash Costs			**$1,916.06**	
Farm equipment & buildings			$40.06	
Irrigation system *			$0.00	
Specialized equipment			$310.90	
Land rental rate			$295.00	
Total Non-Cash Costs			**$645.96**	
Total Costs			**$2,562.02**	

Returns	**AVG**	**Target**	
Yield ton/ac	14	16	
Price $/ton		$397	
Gross Return	**$5,558**	**$6,352**	
Net Return	**$2,996**	**$3,790**	

Specialized equipment	$/ac/yr	
Potato field equipment	$130.25	
Potato handling equipment	$60.12	
Potato storage facility	$120.34	
TOTAL	$310.90	

* 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	14,520	plants/acre
Weight of Seed Piece	60	grams
Seeding Rate	0.9	tons/ac

Fertilization
Soil test to ensure adequate fertility for yield and quality. Fertigation 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 P_2O_5, and 20–30 lb/ac K_2O.

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 skin set and mature tubers, control tuber size, and 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 landowner's responsibility to disclose herbicide use, including spot usage for perennial weed control. When in doubt, consult a potato specialist.

† Refer to the Canada-Saskatchewan Irrigation Diversification Centre *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.

Carrot (Nantes)

ECONOMICS

ITEM		#	UNIT	$/ac	My Farm $/ac
Seed				$800	
Seed treatment/inoculant				$0.00	
Soil test				$1.00	
Fertilizer:	N	60	lb	$71.02	
	P_2O_5	250	lb	$259.75	
	K_2O	25	lb	$20.12	
Herbicide				$42.00	
Insecticide				$0.00	
Fungicide				$0.00	
Equipment fuel				$17.21	
Equipment repair				$75.00	
Custom work				$0.00	
Irrigation power		8	inches	$16.67	
Irrigation repair				$16.92	
Irrigation service/water charge				$50.53	
Crop insurance		13	tons/ac	$87.50	
Hail insurance				$0.00	
Hired labour		15	hr/ac	$405.00	
Other				$0.00	
Storage O & M				$71.00	
Farm overhead				$13.85	
Operating interest		4.5	%	$125.18	
Total Cash Costs				**$5,688.75**	
Farm equipment & buildings				$40.06	
Irrigation system				$40.01	
Specialized equipment				$1,554.52	
Land				$140.00	
Total Non-Cash Costs				**$1,774.58**	
Total Costs				**$7,463.34**	

Returns	AVG	Target	
Yield ton/ac	13	15	
Price $/ton		$1,102	
Gross Return†	**$14,330**	**$16,535**	
Net Return†	**$6,867**	**$9,071**	

Specialized equipment	$/ac/yr	
Carrot field equipment	$651.25	
Carrot handling equipment	$300.74	
Carrot storage facility	$601.16	
TOTAL	$1,554.52	

AGRONOMICS

This carrot budget is based on a 100 acre carrot farm that owns land.

Variety Selection
Choose varieties based on the intended market.

Seeding:

Plant population	60-100 plants/m
Weight of Seed Piece	2.0 grams/TKW
Seeding Rate	4-5 lb/ac

Fertilization
Soil test to ensure adequate fertility for yield and quality. Split the required N application, approximately half of the N should be applied in the growing season by fertigation or broadcast. This will prevent excess top growth and help prevent disease. If banding the P reduce the rates to one-fifth.

Crop Water Use and Irrigation

- Total seasonal crop water use: 400–500 mm ✻
- Irrigation during establishment may be needed to overcome soil crusting or dry conditions.

Average weekly crop water use:

- 38 mm weekly June - August

Importance of Irrigation Scheduling:

- *Carrots do not tolerate drought*
- *Irrigation is essential for establishment*
- *Adequate irrigation promotes the development of long straight roots*

Maintain soil water content above 70% field capacity.

Harvest:
Carrots are generally harvested when they have achieved the appropriate size. Early carrots while tender and sweet, might not be physiologically mature enough for long term storage. A physiologically mature plant is desired for long term storage.

Post Harvest:

Before storage remove tops, clean and wash, remove culls. Quick reduction of heat will lengthen storage period. Suitable varieties of carrots can store for 5-9 months at 0°C and 95% humidity. Even with perfect storage some degree of loss (weight, quality) can be expected. Post-storage grading is recommended.

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.

† These numbers are based on 100% marketing success; strong caution is recommended to new vegetable producers.

✻ Provided by *Commercial Vegetable Production on the Prairies*

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

Appendix A

CROP	Seed Cost	Seed Treatment	Burnoff	Herbicide	Fungicide	Insecticide	Custom Costs	Other Costs
Hard Wheat	$0.32/lb	Cruiser Vibrance Quatro	Glyphosate/ Korrex	Traxos ; Focus	Follicur	Lagon/Cygon		
Durum	$0.33/lb	Cruiser Vibrance Quatro	Glyphosate/ Express FX	Simplicity ; Octtane	Follicur	Lagon/Cygon		
Malt Barley	$0.31/lb	Cruiser Vibrance Quatro	Glyphosate/ Korrex	Avadex; Axial;Infinity	Follicur	Lagon/Cygon		
Feed Barley	$0.31/lb	Cruiser Vibrance Quatro	Glyphosate/ Dicamba 480	Puma Advance/Enforcer M	Follicur	Lagon/Cygon		
Winter Wheat	$0.30/lb	Raxil T	Glyphosate/Heat	Focus; Simplicity; Octtain	Tilt 250E	Lagon/Cygon		
Hybrid Fall Rye	$59.06/bag		Glyphosate/Heat	Achieve Liquid; Buctril M		Lagon/Cygon		
Oats	$0.32/lb	Cruiser Vibrance Quatro	Glyphosate/ Korrex	Prestige; 2,4-D Ester	Tilt 250E	Lagon/Cygon		
Canola	$15.95/lb *	Helix~	Glyphosate/ Conquer	Command; Liberty; Centurion; Facet L	Quadris	Decis		
Soybean	$81.25/bag*	Granular inoc	Glyphosate/ Heat	Glyphosate; Viper ADV; Heat		Matador		
Flax	$0.62/lb		Glyphosate/ MCPA	Authority; Centurion; Buctril M; Reglone Ion	Priaxor	Decis		
Pea	$0.33/lb	Innoc/Apron Maxx	Glyphosate/ Heat	Authority; Viper ADV; Reglone	Priaxor	Matador		
Faba bean	$0.40/lb	TrivexEvergolsheild	Glyphosate/ Express FX	Edge; Viper ADV; Reglone Ion	Priaxor	Matador		
Red Lentil	$0.47/lb	Innoc/Apron Maxx	Glyphosate/ Heat	Egde; Assure II; Sencor; Reglone Ion	Delaro	Matador		
Dry Bean-Pinto	$1.13/lb	Apron Maxx~		Edge; Viper ADV	Quilt			
Dry Bean-Black	$1.25/lb	Apron Maxx~		Edge; Viper ADV	Quilt			
Quinoa	$6.30/lb		Glyphosate/ Express FX			Decis		
Hemp	$2.20/lb		Glyphosate/ Express FX					
Grain Corn	$96.30/ac *	Poncho~	Glyphosate/ Heat	Glyphosate ; Distinct		Matador/Silencer/Labamba	Grain drying	
Corn Grazing	$96..30/ac*	Poncho~	Glyphosate/ Heat	Glyphosate ; Distinct		Lagon/Cygon		
Corn Silage	$96.30/ac *	Poncho~	Glyphosate/ Heat	Glyphosate ; Distinct		Lagon/Cygon		
Cereal Silage	$0.32/lb	Raxil T	Glyphosate/ PrePass	Traxos			Silage	
Seedling Alfalfa	$4.95/lb		Glyphosate					Twine
Seed Potato	$580/ton			Eptam E-8 /Sencore Reglone	Bravo Dithane Quadris	Matador 2* & Malathion	8 aerial spray	Inspection/ Soil Test
Table Potato	$460/ton			Eptam E-8 /Sencor	Bravo Dithane Quadris	Matador 2* & Malathion	8 aerial spray	

* Seed price includes the Technology User Agreement for corn, soybean 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.

Refer to ***Crop Varieties for Irrigation*** for variety selection. Call an Irrigation Agrologist at Saskatchewan Ministry of Agriculture – Crops & Irrigation Branch – Outlook at (306) 867-5500 or refer to our website at www.irrigationsaskatchewan.com