

Table 1. Fuel Charge Rates Applied to Saskatchewan – Effective April 1, 2019

	2019	2020	2021	2022
Natural gas \$/cubic metre	\$0.0391	\$0.0587	\$0.0783	\$0.0979
Gasoline- \$/litre	\$0.0442	\$0.0663	\$0.0884	\$0.1105
Propane- \$/litre	\$0.0310	\$0.0464	\$0.0619	\$0.0774
Diesel- \$/litre	\$0.0548	\$0.0821	\$0.1095	\$0.1369

What assumptions were made when calculating these costing numbers?

Table 2. Calculation of APAS Cost Estimates				
	2019 \$20/tonne	2020 \$30/tonne	2022 \$50/tonne	Assumptions
Electricity	\$0.06/acre	\$0.09/acre	\$0.15/acre	<ul style="list-style-type: none"> - Estimated current total cost of \$2.74/acre^{1,2} - At \$20/tonne, carbon tax charge of 0.2994 cents /Kwh, resulting in avg. cost increase of 2.1% for 2019 and increasing at a rate consistent with the carbon tax (\$0.03/acre annually) - $(\\$2.74 / \text{acre}) * (2.1\% \text{ increase}) = \\$0.06 / \text{acre}$ - At \$30/tonne, estimated cost increase of another \$0.03/acre - $(\\$0.06 / \text{acre}) + (\\$0.03) = \\$0.09 / \text{acre}$ - At \$50/tonne, estimated cost increase \$0.03/acre per year for 2021 and 2022: - $(\\$0.09 / \text{acre}) + (0.06 / \text{acre}) = \\$0.15 / \text{acre}$
Heating	\$0.15/acre	\$0.23/acre	\$0.39/acre	<ul style="list-style-type: none"> - Estimated current total cost of \$0.39/acre^{1,2} - Current Natural Gas Rate April 1, 2019: \$0.0998 Cost/m³ - Carbon Levy (\$20/tonne): \$0.0391 Cost/m³ Natural Gas (40% increase) - $(\\$0.39 / \text{acre}) * (40\% \text{ increase}) = \\$0.15 / \text{acre}$ - At \$30/tonne (\$0.0587 Cost/m³), estimated cost increase of 59% - $(\\$0.39 / \text{acre}) * (59\% \text{ increase}) = \\$0.23 / \text{acre}$ - At \$50/tonne (\$0.0979 Cost/m³), estimated cost increase of 100% - $(\\$0.39 / \text{acre}) * (100\% \text{ increase}) = \\$0.39 / \text{acre}$
Grain Drying	\$0.51/acre	\$0.76/acre	\$1.26/acre	<ul style="list-style-type: none"> - 65.2 bu per acre wheat yield, weighing 60 lbs./bu to be dried 5 points, removing 3.0 lbs water/bu - 2000 average Btu required to remove 1 lb. Water - Propane energy conversion of 25.3 MJ/L - \$0.0391/L of propane carbon tax for 2019, \$0.0464/L in 2020, and \$0.0774/L for 2022 = $\\$0.51 / \text{acre}$ in 2019 increasing to $\\$0.76 / \text{acre}$ in 2020 and $\\$1.26 / \text{acre}$ in 2022.
Rail Freight	\$0.88/acre	\$1.06/acre	\$1.60/acre	<ul style="list-style-type: none"> - Average length of haul for Saskatchewan grain to export position: 1,150 miles - Railway Carbon Tax Surcharge Rates: \$0.04/mile in Saskatchewan and Alberta (65% of haul) miles); \$0.06/mile in BC (35% of haul)³ - $(\\$4.05 \text{ per rail car}) \div (3300 \text{ bushels/rail car}) = \\$0.0164 / \text{bushel}$ - $(65.2 \text{ bu/acre}) * (\\$0.0163 / \text{bushel}) = \\$1.07 / \text{acre}$ - At \$50/tonne, estimated cost is \$80.5 per rail car (\$0.0244/bushel) - $(65.2 \text{ bu/acre}) * (\\$0.0244 / \text{bushel}) = \\$1.60 / \text{acre}$

Trucking Freight	\$0.16/acre	\$0.24/acre	\$0.40/acre	<p>In 2019 at \$20/tonne (\$0.055 carbon cost/litre of diesel):</p> <ul style="list-style-type: none"> - Hauling fully loaded Super B of loaded wheat 63km (39.4 miles) to elevator⁴ (39.4 miles) / 0.99 miles/litre⁵ = 39.8 litres farm to elevator (39.8 litres farm to elevator) * (\$0.055 carbon cost/litre of diesel) = \$2.20 in carbon costs - An empty Super B uses 40% less fuel (39.4 miles) / 1.39 miles/litre⁵ = 28.3 litres to farm (from elevator) (28.3 litres to farm) * (\$0.055 carbon cost/litre of diesel) = \$1.55 in carbon costs - Carbon costs for round trip \$2.20 + \$1.55 = \$3.75 (\$3.75 per trip) ÷ (1500 bushels/trip⁶) = \$0.0025 / bushel (\$0.0025 / bushel) * (65.2 bushels/acre) = \$0.16/acre <p>In 2020 at \$30/tonne (\$0.0821 carbon cost/litre of diesel):</p> <ul style="list-style-type: none"> = \$0.24/acre <p>In 2022 at \$50/tonne (\$0.1369 carbon cost/litre of diesel):</p> <ul style="list-style-type: none"> = \$0.40/acre
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Table 1: Production and Revenue by crop

Crop	Yield (bu/ac)	Price	Gross Revenue	Variable Costs	Other Costs	Net Revenue per acre	Acres	Total Revenue
Canola	53.8	\$10.70	\$575.66	\$351.80	\$152.11	\$71.75	1600	\$114,400
Wheat	64.7	\$6.42	\$415.37	\$238.93	\$152.11	\$24.33	1600	\$38,928
Barley	74.6	\$4.70	\$350.62	\$255.32	\$152.11	-\$56.81	700	-\$39,767
peas	58.4	\$6.85	\$400.04	\$250.83	\$152.11	-\$2.90	700	-\$2,030
oats	139.4	\$3.02	\$420.99	\$207.16	\$152.11	\$61.72	350	\$21,602
Total							5000	\$133,133

Table 2: 2020 Carbon Tax Expenses

Crop	Carbon tax before grain drying	Carbon Tax on grain drying	Drying Requirements: (M = Moisture %)	Total CO2 tax
Canola	\$1.44 x 1600 = \$2,304	\$0.24 x 960 acres = \$230	60% of acres, removing 3.4% M	\$2,534
Wheat	\$1.61 x 1600 = \$2,583	\$0.65 x 1280 acres = \$832	80% of acres, removing 6.4% M	\$3,415
Barley	\$1.78 x 700 = \$1,246	\$0.47 x 560 acres = \$263	80% of acres, removing 3.4% M	\$1,509
peas	\$1.51 x 700 = \$1,057	\$0.17 x 420 acres = \$71	60% of acre, removing 1.9% M	\$1,578
oats	\$2.83 x 350 = \$990	\$1.45 x 280 acres = \$406	80% of acres, removing 8.4% M	\$1,396
Total	\$8,630	\$1,802		\$10,432

Table 3: 2022 Carbon Tax Expenses

Crop	Carbon tax before grain drying	Carbon Tax on grain drying	Drying Requirements:	Total CO2 tax
Canola	$\$2.25 \times 1600 = \$3,600$	$\$0.60 \times 960 \text{ acres} = \576	60% of acres, removing 3.4% M	\$2,099
Wheat	$\$2.52 \times 1600 = \$4,032$	$\$1.63 \times 1280 = \$2,084$	80% of acres, removing 6.4% M	\$2,978
Barley	$\$2.76 \times 700 = \$1,932$	$\$0.79 \times 560 = \442	80% of acres, removing 3.4% M	\$5,773
peas	$\$2.36 \times 700 = \$1,652$	$\$0.43 \times 420 = \180	60% of acres, removing 1.9% M	\$1,892
oats	$\$4.32 \times 350 = \$1,519$	$\$2.37 \times 280 = \664	80% of acres, removing 8.4% M	\$2,183
Total	\$12,735	\$3,942		\$16,681