

INDUSTRIAL HEMP SEED PRODUCTION COSTS AND RETURNS IN ALBERTA, 2015

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Project Team

The project team included:

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This report provides a summary of the 2015 cost of production study for industrial hemp seed grown in Alberta. In total, 10 growers were surveyed to collect their cost of production information. These growers had a total of 2,370 acres (19 fields) representing about 10 per cent of Alberta's hemp seeded acreage in 2015. Out of this total, 1,340 acres (10 fields) were on irrigated land and the remaining 1,030 acres (9 fields) were on dryland. The raw data obtained were reviewed for any information gaps before entering into the computer for analysis. Preliminary results were sent to the survey participants for their review and comments. Specifically, numbers which appeared to be out of range were identified and the growers were asked to verify.

Tables 1 and 2 show the estimated cost of production benchmarks for dryland and irrigated hemp seed grown in Alberta. All of the costs are weighted averages and expressed on a per acre basis. Growers are advised to note that benchmarks do not suggest that all producers in a region have the same "average costs", so application of these averages to individual situations requires caution. In fact, significant farm to farm variation is normal.

Gross Returns

As shown in Table 1, the average area cropped by each dryland grower was approximately 103 acres. Their yield was estimated at 1,074 pounds per acre. With a price of \$0.74 per pound, average gross returns including miscellaneous receipts, was estimated at approximately \$805 per acre. With regards to hemp grown on irrigated land (Table 2), the average area cropped by a grower was estimated at 133 acres. Their yield was estimated at 1,679 pounds per acre, 56 per cent higher compared to dryland. With a price of \$0.74 per pound, average gross returns including miscellaneous receipts, was estimated at approximately \$1,322 per acre, 64 per cent higher compared to dryland. None of the growers surveyed have realized any revenue from the sale of hemp straw; however, there is potential in the future for straw revenue.

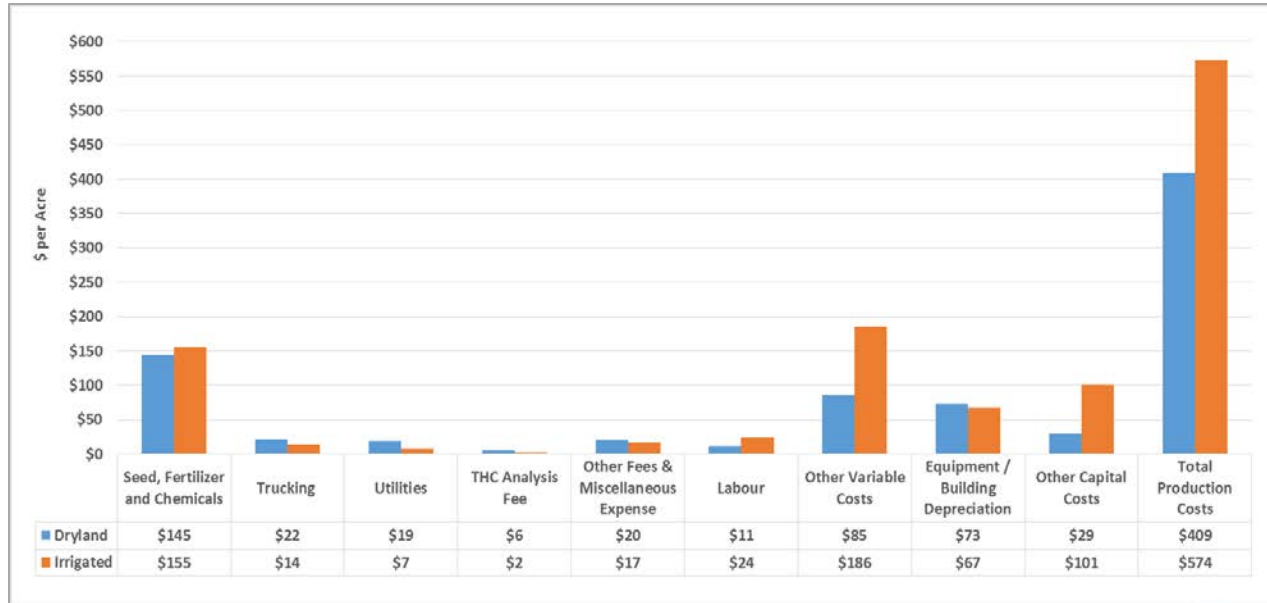
Total Production Costs

Total production costs for hemp seed grown on dryland was estimated at \$409 per acre or \$0.38 per pound of hemp seed produced (Table 1). Of this, approximately 75 per cent were variable costs and the remaining 25 per cent were capital or fixed costs. The corresponding costs for hemp seed grown on irrigated land was estimated at \$574 per acre or \$0.34 per pound (Table 2). Of this, approximately 71 per cent were variable costs and the remaining 29 per cent were capital or fixed costs.

Expenses associated with seed, fertilizer and chemicals accounted for a significant portion of the operating expenses of growers. For example, it was approximately \$145 per acre for dryland farmers and \$155 per acre for growers on irrigated land. For dryland, this translates to about 35 per cent of total production costs or 44 per cent of total cash costs. Similarly, under irrigation this translates to about 27 per cent of total production costs or 31 per cent of total cash costs. Total cash costs represent all out-of-pocket expenses incurred during the production period. It does not include costs associated with operator and family labour and depreciation for buildings and equipment.

Figure 1 shows a graphical presentation of the total production costs per acre for hemp seed grown on both dryland and irrigated land.

Figure 1 Breakdown of Hemp Seed Total Production Costs, 2015



As shown in Figure 1, expenses associated with testing for tetrahydrocannabinol (THC) was higher for dryland compared to irrigated land. This is due to the different mix of hemp varieties cultivated by the growers. Field sampling and testing for THC is a requirement for some hemp varieties. In Alberta, the varieties CRS-1, CFX-2, USO 14, USO 31 and Crag are exempt from annual testing as required under paragraph 16(1) of the Industrial Hemp Regulations. In total, 11 cultivars are exempt from THC testing in all Canadian Provinces. Increasingly, cultivars are being exempted on an annual basis.

Net Returns (Gross Margin, Returns to Unpaid Labour, Investment, and Equity)

Section (F) of Tables 1 and 2 presents gross margin, returns to unpaid labour, investment, and equity for both dryland and irrigated hemp seed respectively. The following procedures were used to calculate net returns:

Gross Margin

Gross margin is the difference between gross returns and total cash costs. Average gross margin for irrigated land was estimated at \$826 per acre (Table 2). This was approximately 72 per cent higher compared to the \$479 per acre obtained under dryland conditions (Table 1).

Return to Unpaid Labour

Return to unpaid labour is gross returns less total production costs other than costs imputed for unpaid family and operator labour. As shown on Table 1, return to unpaid labour for dryland was positive at \$407 per acre or \$0.37 per pound of seed produced.

Return to unpaid labour for hemp seed grown on irrigated land was also positive at \$758 per acre or \$0.45 per pound (Table 2).

Return to Investment

Return to investment is gross return less total production costs with the exception of interest payments on capital spending. This reflects the dollar or per cent return to the total value of assets. As shown on Table 1, return to investment for dryland was positive at \$405 per acre or \$0.37 per pound. Return to investment for hemp seed grown on irrigated land was also positive at \$768 per acre or \$0.46 per pound (Table 2).

Return to Equity

Return to equity is gross returns less total production costs (including all capital costs). Return to equity for dryland and irrigated were also positive at \$396 per acre or \$0.37 per pound and \$748 per acre or 0.45 per pound respectively (Table 2).

Table 1: Dryland Hemp Seed Cost of Production in Alberta, 2015

	Group Average	
Acres Cropped (Acres)	103.33	
Number of Fields (Enterprises)	9	
Yield Per Acre (Pound)	1,073.90	
Expected Market Price Per Pound	\$0.74	
	\$/Acre	\$/Pound
A. GROSS RETURNS		
Crop Sales	794.69	0.74
Crop Insurance Receipts	0.00	
Miscellaneous Receipts	10.58	
TOTAL GROSS RETURN	805.27	
B. VARIABLE COSTS		
Seed	57.55	
Fertilizer Rates: 65N 18P 11K 11S	68.39	
Chemicals	18.88	
Hail / Crop Insurance	14.91	
Trucking and Marketing	21.51	
Machine Fuel (Net of Rebate)	24.39	
Irrigation Fuel	0.00	
Repairs - Machinery	15.28	
Repairs - Buildings	4.04	
Utilities	18.84	
THC Analysis Fee	5.81	
Other Fees and Miscellaneous Expense	19.88	
Custom Work and Specialized Labour	22.80	
Operating Interest Paid	3.75	
Paid Labour and Benefits	0.73	
Unpaid Family and Operator Labour	10.72	
TOTAL VARIABLE COSTS	307.46	0.29
C. CAPITAL COSTS		
Cash Rent / Crop Share	2.15	
Taxes, Water Rates, Insurance	17.94	
Equipment / Building Depreciation	72.70	
Lease Payments	0.00	
Paid Capital Interest	9.01	
TOTAL CAPITAL COSTS	101.80	0.09
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	325.84	0.30
E. TOTAL PRODUCTION COSTS (B+C)	409.26	0.38
F. NET RETURNS		
Gross Margin (A-D)	479.43	0.45
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	406.73	0.37
Return to Investment (A-E + Paid Capital Interest)	405.02	0.37
Return to Equity (A-E)	396.01	0.37
INVESTMENT		
Land	3,954.30	
Buildings	475.66	
Machinery	556.60	
Irrigation Machinery	0.00	
TOTAL	4,986.56	

Source: Economics Section, Alberta Agriculture and Forestry, Edmonton, Alberta.

Table 2: Irrigated Hemp Seed Cost of Production in Alberta, 2015

	Group Average	
	\$/Acre	\$/Pound
Acres Cropped (Acres)	133.0	
Number of Fields (Enterprises)	10	
Yield Per Acre (Pound)	1,678.74	
Expected Market Price Per Pound	\$0.74	
A. GROSS RETURNS		
Crop Sales	1,242.27	0.74
Crop Insurance Receipts	79.36	
Miscellaneous Receipts	0.00	
TOTAL GROSS RETURN	1,321.63	
B. VARIABLE COSTS		
Seed	65.32	
Fertilizer Rates: 84N 17P 9K 8S	57.19	
Chemicals	32.52	
Hail / Crop Insurance	56.49	
Trucking and Marketing	13.80	
Machine Fuel (Net of Rebate)	32.62	
Irrigation Fuel	27.92	
Repairs - Machinery	17.88	
Repairs - Buildings	7.17	
Utilities	7.50	
THC Analysis Fee	2.17	
Other Fees and Miscellaneous Expense	16.97	
Custom Work and Specialized Labour	33.46	
Operating Interest Paid	10.58	
Paid Labour and Benefits	13.34	
Unpaid Family and Operator Labour	10.74	
TOTAL VARIABLE COSTS	405.67	0.24
C. CAPITAL COSTS		
Cash Rent / Crop Share	46.92	
Taxes, Water Rates, Insurance	34.06	
Equipment / Building Depreciation	67.21	
Lease Payments	0.00	
Paid Capital Interest	20.09	
TOTAL CAPITAL COSTS	168.28	0.10
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	496.00	0.30
E. TOTAL PRODUCTION COSTS (B+C)	573.95	0.34
F. NET RETURNS		
Gross Margin (A-D)	825.63	0.49
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	758.41	0.45
Return to Investment (A-E + Paid Capital Interest)	767.76	0.46
Return to Equity (A-E)	747.68	0.45
INVESTMENT		
Land	6,487.22	
Buildings	707.12	
Machinery	321.22	
Irrigation Machinery	45.11	
TOTAL	7,560.67	

Source: Economics Section, Alberta Agriculture and Forestry, Edmonton, Alberta.