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Farm Machinery Economic Costs for 1996:

Minnesota Estimates with Expanded Tillage Data for the U.S. and Canada

by

William Lazarus

DEPARTMENT OF APPLIED ECONOMICS

COLLEGE OF AGRICULTURAL, FOOD, AND ENVIRONMENTAL SCIENCES

UNIVERSITY OF MINNESOTA

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Farm Machinery Economic Costs for 1996: Minnesota Estimates With Expanded Tillage Data for the U.S. and Canada

The tables in this publication estimate farm machinery operations function costs for 1996. The estimates use an economic engineering approach. The data represents an average farming industry cost for specified machines and operations. As other states have reduced their extension programming in the area of farm machinery management, the Minnesota cost estimates have been receiving broader usage around the United States.

Many agricultural input suppliers today are taking a more active role in providing management education as a way of adding value to their products and helping their customers to make decisions about the products. One particular instance of this role is Deere and Company of Moline, Illinois. Deere now uses the figures from this report to provide economic cost estimates for its tillage equipment to make it easier for farmers to compare the cost of tillage with other weed control alternatives such as chemicals. Staff at Deere provided data which was used to refine the set of prices, tractor sizes, and operating speeds in this paper, for use by anyone with an interest in farm machinery operating costs. This paper includes data for an expanded list of tillage equipment not included in the earlier extension folder FO-6696, and includes costs expressed in Canadian dollar terms and with adjustments in fuel prices to Canadian levels.

Machine costs are separated into time and use related categories. Overhead costs accrue to the owner whether or not a machine is used. Overhead includes time-related economic costs: depreciation, interest, insurance and housing. There are no personal property taxes in Minnesota. Operating costs occur only when a machine is used. They include fuel, lubrication, use related repairs and labor charges an economic cost.

OVERHEAD COSTS: Time-related costs are prorated over a 12 year economic life. Salvage values are estimated based on procedures suggested in a February 1995 American Journal of Agricultural Economics article "Depreciation Patterns for Agricultural Machinery," by Timothy Cross and Gregory Perry. Salvage values at 12 years of life now range from 18 to 50 percent. Producers are keeping machinery longer than in the past. Managers, striving for cost control, are sometimes buying a second item often "twinned" to one now in use.

Purchase prices are discounted from manufacturers' list prices. A 15 percent discount off list price appears "normal." The tables include some adjustment for Minnesota sales tax, delivery and setup. An equivalent price adjustment for the income tax expensing option is not included. The interest rate is assumed to be 9.5 percent. Insurance is 0.85 percent of new cost. A housing charge on average investment of 33 cents per square foot of shelter space needed per year is made.

Formulas used to compute machinery overhead costs:

$$\text{Depreciation per year} = \frac{\text{purchase cost} - \text{salvage value}}{\text{years you will use machine}}$$

$$\text{Interest per year} = \frac{\text{purchase cost} + \text{salvage value}}{2} \times \text{interest rate}$$

$$\text{Insurance per year} = \frac{\text{purchase cost} + \text{salvage value}}{2} \times \text{rate}$$

$$\text{Housing per year} = \text{price per sq. foot} \times \text{sq. feet shelter space required}$$

$$\text{Taxes per year} = 0 \text{ (no taxes on personal property in Minnesota)}$$

OPERATING COSTS: Fuel cost is calculated by multiplying the fuel consumption by the price of fuel, with fuel consumption assumed to be 0.058 gallons of diesel fuel per horsepower hour. The price of farm diesel fuel is projected at 80 cents per gallon. All power units, tractors, combines, trucks, etc., use diesel fuel. Lubrication cost is assumed to be 15 percent of fuel cost.

The formulas for repair and maintenance costs estimate total accumulated repair costs according to the accumulated hours of lifetime use. Repair and maintenance calculations are based on American Society of Agricultural Engineers formulas. The total cost is then divided to an average per hour cost estimate. The amount of annual use of a machine is an estimate of the number of hours a commercial farmer would use that particular machine in one year.

Labor is charged at an hourly wage rate, which includes a 30 percent benefits factor. Charge rates are \$9.00 per hour for unskilled labor and \$11.50 per hour for skilled labor. Labor per acre for an operation such as plowing or disking is calculated by using the work rate on the implement. Less labor per acre is used in a disking operation that covers more acres per hour than in a plowing operation.

Several reduced and conservation tillage implements were added to the database. Minimum tillage planters are included. These reflect the current interest in reduced tillage practices.

Average machine function cost-per-acre-worked show some changes from previous years. Field speeds have increased in line with current practices. The new ASAE repair functions generally lower repair costs per acre and hour. Use lives are increasing. Labor charges were increased. The assumption made about the number of acres of use is still a major influence on the average overhead and the average total machine function cost per acre.

These estimates will not represent any given individual's cost. They can still be used to help plan the cropping operation if more specific data are not available. Differences in buying power, repair programs, average annual use, and overall replacement programs should be considered when making adjustments.

Machinery costs are substantial; control of them is important. Custom charges are often based upon them. No one should do custom work unless the charge will cover operating costs plus a return for one's risk and time. Ideally, all allocated per acre or hour overhead costs should also be covered by anyone offering to do custom work. The market for custom work usually does not cover all costs. The market is usually somewhere in between the operating costs and the total of operating plus allocated per acre or hour overhead.

The following tables provide the 1996 machinery function costs broken down into several categories. Some relevant supporting data also are included.

ACKNOWLEDGEMENTS

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Tractor or Combine Size	Net Cost of New Power Unit	Annual Hours of Use	-- Overhead -- Cost Per Year	Hour	-- Operating -- Expense Per Hour	Year	- Total Cost - Per Year of Use	Maint. & Repair Cost/Hr.	Diesel Use/Hr. Gallons
40	16,700	500	2,151	4.30	2.78	1,389	3,539	0.83	2.1
60	21,200	500	2,726	5.45	3.97	1,986	4,712	1.05	3.2
75	27,100	500	3,479	6.96	4.99	2,497	5,976	1.34	4.0
105 MFWD	45,200	550	5,832	10.60	7.33	4,032	9,864	2.46	5.3
130 MFWD	68,000	550	8,753	15.92	9.55	5,252	14,005	3.70	6.4
150 MFWD	72,300	550	9,327	16.96	10.76	5,916	15,244	3.93	7.4
160 MFWD	81,700	600	10,809	18.02	12.64	7,587	18,396	4.84	8.5
180 MFWD	89,500	600	11,835	19.73	14.09	8,451	20,287	5.31	9.5
200 MFWD	97,300	600	12,864	21.44	15.04	9,021	21,886	5.77	10.1
225 MFWD	105,900	500	13,978	27.96	13.21	6,607	20,585	2.24	11.9
260 4WD	87,300	500	11,538	23.08	14.04	7,020	18,557	1.85	13.3
275 4WD	92,000	500	12,154	24.31	15.36	7,679	19,833	1.95	14.6
310 4WD	103,900	500	13,716	27.43	16.83	8,414	22,130	2.20	15.9
360 4WD	114,000	500	15,041	30.08	19.48	9,740	24,781	2.41	18.6
425 4WD	134,400	500	17,718	35.44	23.57	11,785	29,503	2.85	22.5
Combine Small	93,900	300	12,784	42.61	22.96	6,887	19,671	18.08	5.3
Combine Med	100,200	300	13,668	45.56	25.15	7,544	21,211	19.29	6.4
Combine Large	116,400	300	15,889	52.96	29.48	8,845	24,734	22.41	7.7
Combine Jumbo	125,700	300	17,172	57.24	33.96	10,187	27,359	24.21	10.6

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Ac/yr	Total Cost /Hour	----- Total Cost/Acre ----- Equipment Tractor + Machine + Charge	Labor Expense / Acre	Diesel Fuel Gal/Ac
75	3,500	5.82	582	27.33	2.05	1.06	1.07
130 MFWD	5,500	8.73	873	44.08	2.92	1.08	1.32
150 MFWD	6,000	9.89	989	47.12	2.80	1.03	1.30
160 MFWD	9,700	11.05	1,105	55.92	2.77	1.45	1.45
200 MFWD	10,902	13.38	1,338	63.72	2.73	1.35	1.41
225 MFWD	16,800	18.04	1,804	77.90	2.28	1.53	1.06
310 4WD	14,837	21.53	2,153	78.11	2.06	1.15	1.03
360 4WD	28,106	27.35	2,735	104.39	1.81	1.67	1.08
425 4WD	31,004	32.00	3,200	118.42	1.84	1.57	1.08
75	5,333	3.86	386	29.85	3.09	2.26	1.62
105 MFWD	6,871	5.41	541	38.44	3.32	2.09	1.66
150 MFWD	7,354	6.95	695	49.12	3.99	1.76	1.80

Tillage Equipment

Chisel Plow 10 Ft	75	3,500	5.82	582	27.33	2.05	1.06	4.70	1.07	0.68
Chisel Plow 15 Ft	130 MFWD	5,500	8.73	873	44.08	2.92	1.08	5.05	1.32	0.73
Chisel Plow 17 Ft	150 MFWD	6,000	9.89	989	47.12	2.80	1.03	4.76	1.30	0.75
Chisel Plow 19 Ft	160 MFWD	9,700	11.05	1,105	55.92	2.77	1.45	5.06	1.45	0.77
Chisel Plow 23 Ft	200 MFWD	10,902	13.38	1,338	63.72	2.73	1.35	4.76	1.41	0.75
Chisel Plow 31 Ft	225 MFWD	16,800	18.04	1,804	77.90	2.28	1.53	4.32	1.06	0.66
Chisel Plow 37 Ft	310 4WD	14,837	21.53	2,153	78.11	2.06	1.15	3.63	1.03	0.74
Chisel Plow 47 Ft	360 4WD	28,106	27.35	2,735	104.39	1.81	1.67	3.82	1.08	0.68
Chisel Plow 55 Ft	425 4WD	31,004	32.00	3,200	118.42	1.84	1.57	3.70	1.08	0.70
Chisel Plow, Front Dsk 6 Ft	75	5,333	3.86	386	29.85	3.09	2.26	7.73	1.62	1.03
Chisel Plow, Front Dsk 9 Ft	105 MFWD	6,871	5.41	541	38.44	3.32	2.09	7.11	1.66	0.98
Chisel Plow, Front Dsk 11 Ft	150 MFWD	7,354	6.95	695	49.12	3.99	1.76	7.06	1.80	1.07

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre -----		Operating Expense / Acre	Diesel Fuel Gal/Ac			
				Equipment Tractor +	Machine + Labor + Charge					
Tillage Equipment										
Chisel Plow, Front Dsk 14 Ft	10,583	8.50	850	60.26	3.98	2.03	1.08	7.09	1.96	1.12
Chisel Plow, Front Dsk 16 Ft	11,912	10.05	1,005	65.00	3.63	1.93	0.91	6.47	1.78	1.00
Chisel Plow, Front Dsk 19 Ft	17,909	11.59	1,159	75.00	3.20	2.48	0.79	6.47	1.58	1.14
Chisel Plow, Disk 21 Ft Fold	18,782	13.14	1,314	83.51	3.37	2.29	0.70	6.36	1.62	1.21
Moldboard Plow 4-18	8,000	2.78	334	33.17	4.30	4.33	3.30	11.92	3.11	1.43
Moldboard Plow 5-18	12,347	3.48	417	45.66	5.16	5.33	2.64	13.13	3.73	1.52
Moldboard Plow 6-18	13,500	4.17	542	54.29	6.10	4.71	2.20	13.01	3.86	1.52
Moldboard Plow 7-18	15,800	4.87	633	59.85	5.69	4.72	1.89	12.29	3.79	1.52
Moldboard Plow 8-18	18,860	5.56	723	67.20	5.51	4.92	1.65	12.08	3.92	1.52
Moldboard Plow 9-18	23,900	6.26	939	83.30	6.58	5.26	1.47	13.31	4.20	1.91
Moldboard Plow 10-18	26,210	6.95	1,043	82.41	5.34	5.19	1.32	11.85	4.08	1.91
Moldboard Plow 12-18	30,000	8.35	1,252	90.22	4.75	4.96	1.10	10.81	3.80	1.75
Reversible Plow 2-18	2,383	1.39	209	22.03	6.78	2.46	6.60	15.84	3.79	2.29
Reversible Plow 5-18	6,973	3.48	522	49.58	8.82	2.80	2.64	14.26	4.73	2.44
Reversible Plow 5-18 HD	9,051	3.48	522	52.51	8.82	3.64	2.64	15.10	5.06	2.44
Reversible Plow 8-18	12,786	5.56	835	68.25	7.40	3.22	1.65	12.27	3.63	2.14
Field Cultivator 12 Ft	4,500	9.02	1,082	27.87	1.33	0.75	1.02	3.09	0.74	0.44
Field Cultivator 18 Ft	6,000	12.98	1,558	36.00	1.38	0.68	0.71	2.77	0.73	0.41
Field Cultivator 28 Ft	10,554	20.19	2,423	55.33	1.52	0.77	0.45	2.74	0.82	0.42
Field Cultivator 37 Ft	16,200	26.68	3,202	73.83	1.54	0.88	0.34	2.77	0.72	0.45
Field Cultivator 47 Ft	20,200	33.90	4,068	75.47	1.09	0.86	0.27	2.23	0.63	0.39
Field Cultivator 60 Ft	26,600	43.27	5,193	91.50	1.02	0.88	0.21	2.11	0.61	0.37
Tandem Disk 9 Ft Rigid	4,240	5.41	541	23.21	1.31	1.28	1.70	4.29	0.70	0.39
Tandem Disk 11 Ft Rigid	5,164	6.40	640	27.78	1.47	1.43	1.43	4.34	0.91	0.50
Tandem Disk 15 Ft Rigid	6,966	8.73	873	39.48	2.06	1.42	1.05	4.52	1.12	0.61
Tandem Disk 18 Ft Fold	12,734	10.47	1,047	58.98	2.65	2.11	0.88	5.63	1.46	0.71
Tandem Disk 21 Ft Fold	14,743	12.22	1,222	65.39	2.51	2.09	0.75	5.35	1.46	0.69
Tandem Disk H.D. 8 Ft Rigid	8,800	4.65	465	42.28	3.85	3.26	1.97	9.08	2.24	1.14
Tandem Disk H.D. 12 Ft Rigid	8,086	6.98	698	48.78	3.65	2.02	1.31	6.99	1.78	0.91
Tandem Disk H.D. 15 Ft Rigid	9,232	8.73	873	53.08	3.18	1.85	1.05	6.08	1.61	0.85
Tandem Disk H.D. 18 Ft Fold	14,752	10.47	1,047	65.47	2.93	2.45	0.88	6.25	1.71	0.81
Tandem Disk H.D. 30 Ft Fold	26,417	17.45	1,745	103.91	2.84	2.59	0.53	5.95	1.65	1.06
Tandem Disk HD 9" Spc 27 Ft	21,990	12.52	1,252	88.60	3.54	2.81	0.73	7.08	1.77	1.27
Tandem Disk HD 9" Spc 32 Ft	26,805	14.84	1,484	101.91	3.34	2.91	0.62	6.87	1.75	1.25
Finish Tandem Disk 18 Ft	14,800	9.27	927	60.60	2.99	2.56	0.99	6.53	1.54	0.80
Finish Tandem Disk 21 Ft	16,100	10.82	1,082	62.72	2.56	2.39	0.85	5.80	1.35	0.69

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre ----- Equipment Tractor +	Labor + Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac		
Finish Tandem Disk 27 Ft	20,800	13.91	1,391	83.68	2.96	2.40	0.66	6.02	1.31	0.86
Finish Tandem Disk 32 Ft	22,114	16.48	1,648	82.30	2.25	2.18	0.56	4.99	1.17	0.80
Offset Disk 7 Ft	4,491	3.25	325	25.88	2.90	2.24	2.83	7.97	1.56	0.98
Offset Disk 10.5 Ft	6,259	4.87	487	31.32	2.46	2.09	1.89	6.43	1.34	0.82
Offset Disk 12.5 Ft	8,113	5.80	580	40.28	3.09	2.27	1.58	6.95	1.60	0.91
Offset Disk 16 Ft	13,200	7.42	742	56.04	3.43	2.88	1.24	7.55	1.72	0.86
Offset Disk 18 Ft	13,108	8.35	835	64.35	4.05	2.56	1.10	7.71	2.07	1.14
Offset Disk Wing 21 Ft	18,100	9.74	974	71.97	3.47	2.98	0.94	7.39	1.89	0.98
Offset Disk Wing 23 Ft	21,800	10.66	1,066	85.11	3.86	3.26	0.86	7.98	1.73	1.12
V-Ripper 20 O.C. 5 Ft	9,000	3.09	309	48.87	8.24	4.60	2.97	15.81	4.08	2.06
V-Ripper 25 O.C. 6.25 Ft	9,000	3.86	386	48.90	6.59	3.69	2.38	12.66	3.27	1.65
V-Ripper 25 O.C. 7.5 Ft	9,000	4.64	464	51.17	5.98	3.08	1.98	11.04	2.98	1.60
V-Ripper 25 O.C. 10 Ft	9,000	6.18	618	51.50	4.48	2.36	1.49	8.33	2.24	1.20
V-Ripper 25 O.C. 14 Ft	11,000	8.65	865	63.53	4.21	2.07	1.06	7.34	2.17	1.16
V-Ripper 25 O.C. 18 Ft	16,000	11.13	1,113	72.21	3.34	2.33	0.83	6.49	1.75	1.19
V-Ripper 25 O.C. 25 Ft	17,000	15.45	1,545	81.29	2.86	1.80	0.59	5.26	1.46	1.03
V-Ripper 30 O.C. 12.5 Ft	7,500	7.73	773	52.20	3.97	1.60	1.19	6.75	1.97	1.10
V-Ripper 30 O.C. 17 Ft	9,500	10.51	1,051	61.35	3.47	1.49	0.87	5.84	1.74	0.96
V-Ripper 30 O.C. 22.5 Ft	14,000	13.91	1,391	81.85	3.56	1.66	0.66	5.88	1.74	1.33
Comb Fld Cult Incorp 16 Ft	18,275	11.54	1,154	70.88	2.66	2.69	0.80	6.14	1.64	0.73
Comb Fld Cult Incorp 19 Ft	20,743	13.70	1,370	78.30	2.47	2.58	0.67	5.71	1.55	0.70
Comb Fld Cult Incorp 23 Ft	23,216	16.59	1,659	85.27	2.20	2.39	0.55	5.14	1.38	0.61
Comb Fld Cult Incorp 26 Ft	23,600	18.03	1,803	86.68	2.06	2.24	0.51	4.81	1.23	0.73
Comb Fld Cult Incorp 33 Ft	28,700	23.80	2,380	102.63	1.86	2.07	0.39	4.31	1.12	0.67
Comb Disk & V-Ripper 12.5 Ft	16,283	6.44	644	76.27	6.39	4.02	1.43	11.84	2.66	1.85
Comb Disk & V-Ripper 17.5 Ft	20,817	9.02	902	92.10	5.50	3.70	1.02	10.22	2.72	2.06
Disk,Fld Cult Finish 13 Ft	10,160	9.79	979	51.63	2.60	1.74	0.94	5.27	1.23	0.65
Disk,Fld Cult Finish 22 Ft	18,405	9.79	979	72.85	3.45	3.05	0.94	7.44	1.89	0.97
Disk,Fld Cult Finish 30 Ft	24,600	15.45	1,545	86.02	2.40	2.57	0.59	5.57	1.29	0.86
Disk,Fld Cult Finish 38 Ft	29,555	9.79	979	101.07	4.52	4.87	0.94	10.33	2.45	1.62
Roller Harrow 12 Ft	7,778	7.42	742	33.94	1.61	1.73	1.24	4.57	0.93	0.54
Roller Harrow 28 Ft	20,256	17.31	1,731	75.60	1.95	1.88	0.53	4.37	1.10	0.55
Springtooth Drag 30 Ft	6,900	21.64	649	49.36	0.44	1.40	0.45	2.28	0.25	0.15
Springtooth Drag 48 Ft	8,700	34.62	1,212	55.81	0.35	0.99	0.28	1.61	0.20	0.11
Spring Tooth Drag 58 Ft	10,200	41.83	4,183	43.59	0.43	0.40	0.22	1.04	0.26	0.13
Planting Equipment										
Row Crop Planter 4-36	9,100	5.60	392	39.91	1.26	3.48	2.38	7.13	0.91	0.38

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Ac/yr	Total Cost /Hour	----- Total Cost/Acre ----- Tractor + Equipment	Labor + Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac	
Row Crop Planter 6-30	16,000	7.00	490	56.60	1.35	4.83	1.91	8.09	1.14	0.45
Row Crop Planter 8-30	19,000	9.33	653	65.46	1.28	4.30	1.43	7.01	1.05	0.43
Row Crop Planter 12-30	31,000	14.00	980	96.69	1.28	4.67	0.95	6.91	1.08	0.38
Min-Till Planter 4-36	15,700	5.09	356	55.88	1.85	6.51	2.62	10.98	1.56	0.62
Min-Till Planter 6-30	21,500	6.36	509	65.81	1.88	6.37	2.10	10.34	1.68	0.62
Min-Till Planter 8-30	27,100	8.48	594	88.16	2.11	6.70	1.57	10.39	1.67	0.62
Min-Till Planter 12-30	51,200	12.73	1,273	124.64	2.41	6.34	1.05	9.79	2.16	0.67
Min-Till Planter 16-30	69,500	12.73	1,655	141.11	2.87	7.17	1.05	11.09	2.95	0.79
Potato Planter Filler	10,900	5.75	322	28.67	0.00	4.99	0.00	4.99	0.53	0.02
Potato Row Marker 4 Row	10,000	4.98	214	70.54	5.11	6.19	2.86	14.17	2.10	1.28
Potato Row Marker 6 Row	16,000	7.47	321	91.27	3.71	6.60	1.91	12.22	1.63	0.99
Potato Row Marker 8 Row	20,000	10.79	464	106.69	2.84	5.72	1.32	9.88	1.34	0.79
Potato Planter 4 Row	30,000	3.83	214	126.08	6.65	19.63	6.64	32.92	4.30	1.66
Potato Planter 6 Row	40,000	5.75	322	153.48	4.82	17.46	4.42	26.71	3.48	1.29
Potato Planter 8 Row	55,000	8.30	465	194.09	3.69	16.62	3.06	23.38	3.05	1.02
Beet Planter 12 Row	25,300	4.67	280	92.51	3.84	12.92	3.06	19.82	2.86	1.14
Grain Drill 25 Ft	25,300	10.61	848	86.01	2.40	4.50	1.20	8.11	1.54	0.60
Grain Drill 30 Ft	29,900	12.73	1,018	96.84	2.18	4.43	1.00	7.61	1.47	0.58
Grain Drill 35 Ft	31,100	14.85	1,188	102.07	2.06	3.95	0.86	6.87	1.41	0.57
Presswheel Drill 12 Ft	15,500	5.09	382	55.48	2.35	6.04	2.51	10.90	1.77	0.78
Presswheel Drill 16 Ft	20,200	6.79	509	70.76	2.64	5.90	1.88	10.43	1.85	0.78
Presswheel Drill 20 Ft	24,500	8.48	636	86.84	3.00	5.73	1.50	10.23	1.87	0.75
Presswheel Drill 24 Ft	30,300	10.18	764	100.56	2.72	5.90	1.25	9.88	1.83	0.73
Presswheel Drill 30 Ft	38,000	12.73	1,018	114.78	2.41	5.61	1.00	9.02	1.79	0.67
Presswheel Drill 40 Ft	48,200	16.97	1,358	136.99	1.99	5.33	0.75	8.07	1.59	0.56
Air Seeder Drill 28 Ft	56,000	11.88	950	151.23	2.85	8.81	1.07	12.73	2.44	0.80
Air Seeder Drill 36 Ft	65,000	15.27	1,222	171.36	2.43	7.95	0.84	11.22	2.05	0.87
No-Till Drill 15 Ft	34,600	6.36	509	105.21	4.36	10.17	2.01	16.53	3.14	1.17
No-Till Drill 21 Ft	38,100	8.91	713	117.96	3.80	8.01	1.43	13.24	2.72	1.07
No-Till Drill 30 Ft	41,900	12.73	1,018	127.82	2.87	6.17	1.00	10.04	2.06	0.79

Crop Maintenance Equipment

Cultivator 4-36	4,516	6.18	618	28.26	1.93	1.12	1.51	4.57	0.99	0.64
Cultivator 6-30	3,800	7.73	773	24.72	1.22	0.77	1.21	3.20	0.64	0.41
Cultivator 8-30	5,082	10.30	1,030	45.04	2.69	0.77	0.91	4.37	1.17	0.72
Cultivator 8-38	5,082	13.05	1,305	45.04	2.12	0.61	0.72	3.45	0.92	0.57
Cultivator 12-30	9,609	15.45	1,545	57.81	2.19	0.95	0.61	3.74	1.07	0.62
Cultivator 16-30	11,965	20.61	2,061	64.10	1.77	0.89	0.45	3.11	0.87	0.49

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre ----- Tractor + Equipment	Labor Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac
Cultivator 24-22	26,820	22.67	2,267	90.78	1.82	1.78	0.41	4.00
Cultivator Hi Res 4-36	5,042	6.18	618	29.12	1.93	1.25	1.53	4.71
Cultivator Hi Res 6-30	7,500	7.73	773	38.69	2.32	1.47	1.21	5.01
Cultivator Hi Res 8-30	11,631	10.30	1,030	60.73	3.28	1.70	0.91	5.89
Cultivator Hi Res 8-38	11,631	13.05	1,305	60.73	2.59	1.35	0.72	4.65
Cultivator Hi Res 12-30	16,105	15.45	1,545	76.23	2.66	1.57	0.70	4.93
Rotary Hoe 15 Ft	3,081	18.55	1,855	26.61	0.64	0.29	0.50	1.43
Rotary Hoe 21 Ft	5,900	25.96	2,596	37.30	0.69	0.39	0.36	1.44
Rotary Hoe 30 Ft	5,952	37.09	3,709	47.26	0.75	0.27	0.25	1.27
Potato Cultivator 4 Row	3,800	5.36	778	26.07	2.23	0.89	1.75	4.86
Potato Cultivator 6 Row	5,800	8.04	1,126	34.74	2.23	0.93	1.16	4.32
Sugar Beet Cult. 12 Row	8,500	5.60	336	46.64	3.20	3.45	1.67	8.33
S-P Boom Sprayer 47 Ft	48,000	25.92	2,592	100.31	0.00	3.32	0.55	3.87
S-P Boom Sprayer 60 Ft	49,800	33.09	3,309	103.58	0.00	2.70	0.43	3.13
Sprayer 30 Ft	3,700	15.36	1,229	29.70	0.46	0.54	0.94	1.93
Boom Sprayer 50 Ft	4,700	25.61	2,561	32.81	0.37	0.35	0.56	1.28
Sprayer Hi Pres 50 Ft	19,800	23.64	2,364	59.66	0.40	1.52	0.61	2.52
Anhydrous Appl. 30 Ft	15,400	12.73	509	101.82	2.41	4.65	0.94	8.00
Fert Sprd 4 T/40 Ft	8,000	23.76	713	60.47	0.40	1.64	0.50	2.55
Corn Stalk Chopper 12 Ft	7,100	4.65	465	31.49	2.02	2.61	2.13	6.77
Corn Stalk Chopper 15 Ft	8,325	5.82	582	42.18	3.08	2.47	1.70	7.25
Potato Shredder 18 Ft	10,631	6.98	698	55.98	3.97	2.63	1.42	8.02
Stalk Shredder 20 Ft	12,385	7.76	776	56.83	3.28	2.77	1.28	7.33
Rock Picker 6 Ft	10,400	1.42	85	52.95	8.43	21.30	7.62	37.34

Harvesting Equipment

Mower-Conditioner 9 Ft	9,700	4.36	349	35.12	1.62	4.16	2.27	8.05
Rotary Hay Mower 6 Ft	4,900	2.91	291	25.77	2.43	3.33	3.09	8.86
Rotary Mow/Cond 9 Ft	14,200	4.36	349	47.77	2.74	6.04	2.17	10.95
Hay Rake (Hyd) 9 Ft	3,800	3.49	698	19.85	2.03	1.08	2.58	5.69
Hay Swather-Cond 12 Ft	46,500	5.82	465	113.46	0.00	17.95	1.55	19.50
Swather-Cond 15 Ft	48,500	7.27	582	118.30	0.00	15.03	1.24	16.27
Grain Swather 18 Ft Pull Type	8,900	8.73	698	41.57	1.37	2.36	1.03	4.76
Grain Swather 21 Ft Pull Type	13,382	10.18	815	51.45	1.17	3.00	0.88	5.05
Grain Swather 21 Ft Self-Prop	40,000	10.18	815	100.19	0.00	8.96	0.88	9.84
Hay Baler Pto Twine	13,200	3.78	756	35.75	1.87	4.21	3.38	9.45
Round Baler 1000 Lb	13,000	3.01	603	41.11	3.13	7.20	3.31	13.64
Round Baler 1500 Lb	17,000	4.64	927	47.76	2.03	6.11	2.15	10.30

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre ----- Equipment Tractor +	Labor Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac		
Rd Baler/Wrap 1000 Lb	18,600	3.01	603	50.39	3.13	10.28	3.31	16.72	7.61	1.06
Rd Bale Wrapper Silage	13,900	2.48	372	41.62	3.80	9.35	3.63	16.77	6.13	1.28
Bale Wrapper Dry Hay	6,500	2.48	372	27.00	2.85	4.40	3.63	10.88	3.24	0.85
Forage Harvester 2 Row	21,218	1.65	165	62.38	10.84	19.15	7.72	37.70	6.96	3.20
Forage SP Harvstr 2 Row	125,000	2.04	305	136.96	0.00	60.99	6.27	67.26	6.11	2.41
Forage SP Harvstr 3 Row	155,000	3.05	458	167.01	0.00	50.50	4.18	54.68	5.12	2.06
Large Forage Blower	4,600	1.00	50	31.14	9.42	12.72	9.00	31.14	4.76	3.18
Combine Grain Head Small	9,300	4.41	882	85.83	14.86	1.70	2.89	19.45	5.46	1.20
Combine Grain Hd Medium	11,300	5.09	1,018	92.57	13.89	1.79	2.51	18.18	5.21	1.25
Combine Grain Head Large	15,700	6.79	1,358	107.82	12.15	1.86	1.88	15.88	4.63	1.13
Soybean Combine Hd Small	11,200	3.86	772	87.35	16.98	2.34	3.31	22.63	6.30	1.37
Soybean Combine Hd Medium	13,700	4.45	891	94.47	15.87	2.47	2.87	21.21	6.02	1.43
Soybean Combine Hd Large	18,900	5.35	1,069	110.39	15.42	2.84	2.39	20.65	5.95	1.44
Corn Combine 4-36 Medium	14,000	3.36	672	94.75	21.04	3.36	3.80	28.20	8.00	1.89
Corn Combine 4-30 Medium	16,300	2.80	560	96.54	25.25	4.67	4.56	34.48	9.70	2.27
Corn Combine 6-30 Large	21,700	4.20	840	112.63	19.63	4.15	3.04	26.82	7.66	1.83
Corn Combine 8-30 Large	25,600	5.09	1,018	115.79	16.20	4.04	2.51	22.75	6.41	1.51
Corn Combine 12-30 Jumbo	38,700	7.64	1,527	134.94	11.94	4.06	1.67	17.67	5.07	1.39
Potato Windrower 2 Row	26,000	1.49	149	62.84	8.00	27.56	6.51	42.06	7.53	2.66
Potato Windrower 4 Row	57,000	2.99	299	117.12	6.00	29.94	3.25	39.20	7.04	1.77
Potato Harvester Seed 2 Row	55,000	1.38	295	113.30	18.47	36.96	26.74	82.17	19.93	4.61
Potato Harvester Seed 4 Row	87,000	2.76	590	145.05	10.05	29.17	13.37	52.59	14.18	2.69
Potato Harvester 2 Row	45,000	1.84	294	111.62	13.85	26.80	20.06	60.71	12.30	3.46
Disk Bean Top Cutter 6R	10,700	6.40	512	51.21	2.80	3.20	1.99	8.00	1.53	0.83
Sugar Beet Lifter 4 Row	39,100	3.47	277	122.45	5.18	26.48	3.68	35.34	9.85	1.53
Sugar Beet Lifter 6 Row	51,000	5.20	520	143.43	4.90	20.23	2.45	27.58	9.03	1.22
Sugar Beet Topper 6 Row	15,500	5.33	427	54.64	2.24	5.85	2.16	10.24	1.88	0.75
Sugar Beet Topper 12 Row	30,000	10.67	853	99.45	2.60	5.65	1.08	9.32	1.92	0.70
Sugar Beet Wagon 8 Ton	8,300	3.47	277	36.73	3.45	4.55	2.60	10.60	1.97	1.15
Sugar Beet Wagon 20 Ton	33,000	5.20	520	93.49	6.50	9.75	1.73	17.98	4.21	1.83
Sugar Beet Wagon 24 Ton	35,000	5.20	520	103.87	7.92	10.33	1.73	19.97	4.13	2.29
Manure Spreader 150 Bu	4,500	3.49	349	30.96	3.42	2.81	2.63	8.87	2.44	1.14
Manure Spreader 300 Bu	5,600	3.49	349	39.35	5.14	3.51	2.63	11.27	3.36	1.52
Manure Spreader 400 Bu	11,200	4.65	465	58.94	5.47	5.22	1.97	12.66	3.94	1.37
Gravity Grain Box 185 Bu	2,100	1.65	215	21.53	5.70	1.88	5.44	13.01	2.72	1.92
Gravity Grain Box 240 Bu	2,700	1.65	215	24.82	7.22	2.34	5.44	15.00	3.44	2.40
Belt Bottom V Box 24 Ft	17,800	1.65	215	51.30	11.95	13.62	5.44	31.01	6.07	2.85
Baled Hay Wagon	2,500	3.78	945	27.39	1.87	0.61	4.76	7.24	0.94	0.56

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	-- Ac/yr	Total Cost /Hour	----- Total Cost/Acre ----- Equipment Tractor +	Machine +	Labor Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac
Forage Wagon 14 Ft	8,500	1.65	215	27.01	4.28	6.61	5.44	16.32	2.94	1.28
Forage Wagon 16 Ft	9,500	1.65	215	28.11	4.28	7.27	5.44	16.99	3.09	1.28
1 Ton Hay Stacker	19,200	4.15	829	45.15	2.27	5.54	3.08	10.89	3.48	0.77
3 Ton Hay Stacker	28,400	4.84	1,064	58.19	2.47	6.92	2.64	12.03	4.49	0.82
6 Ton Hay Stacker	45,900	5.53	1,548	84.70	3.24	9.77	2.31	15.32	7.25	0.96

CONVERSION OF THE MINNESOTA COST ESTIMATES TO CANADIAN ECONOMIC CONDITIONS

The above cost estimates may be more useful to Canadian farm operators if some simple adjustments are made. The Minnesota cost estimates were converted to Canadian dollar terms using a July, 1996 conversion rate of \$1.3668 Canadian dollars per \$1.00 U.S. Machinery prices, interest and insurance rates, and the equipment shelter charge were assumed to be the same, apart from the currency conversion, based on information provided by the machinery manufacturer and Canadian machinery dealers. The hourly charge for the machinery operator's wage and fringe benefits is \$12.30 for an unskilled operator and \$15.70 for operations requiring a skilled operator.

The only two cost items that are assumed to be different from costs under Minnesota conditions are fuel and taxes. The diesel fuel price is \$1.50 per gallon, or just under \$0.40 per liter. Canadian sales taxes on machinery (the GST and PST) are rebated on farm machinery so are not included here. Minnesota charges a 2.5 percent sales tax on machinery sales above the trade-in value, so this tax is included in the Minnesota cost estimates on the difference between the purchase price and salvage value.

Tractor or Combine Size	Net Cost of New Power Unit	Annual Hours of Use	-- Overhead -- Cost Per Year	Hour	-- Operating -- Expense Per Hour	Year	-- Total Cost -- Per Year of Use	Hour of Use	Maint. & Repair Cost/Hr.	Diesel Use/Hr. Gallons
Canadian Dollars										
40	22,900	500	2,906	5.81	4.79	2,394	5,299	10.60	1.13	2.1
60	28,900	500	3,661	7.32	6.92	3,458	7,119	14.24	1.43	3.2
75	37,000	500	4,680	9.36	8.69	4,343	9,022	18.04	1.83	4.0
105 MFWD	61,700	550	7,838	14.25	12.50	6,874	14,712	26.75	3.36	5.3
130 MFWD	93,000	550	11,786	21.43	16.03	8,814	20,600	37.46	5.05	6.4
150 MFWD	98,800	550	12,549	22.82	18.17	9,994	22,544	40.99	5.37	7.4
160 MFWD	111,600	600	14,507	24.18	21.25	12,748	27,255	45.43	6.62	8.5
180 MFWD	122,400	600	15,902	26.50	23.71	14,228	30,130	50.22	7.26	9.5
200 MFWD	133,000	600	17,276	28.79	25.26	15,155	32,431	54.05	7.89	10.1
225 MFWD	144,800	500	18,781	37.56	23.64	11,818	30,600	61.20	3.07	11.9
260 4WD	119,400	500	15,507	31.01	25.38	12,692	28,199	56.40	2.53	13.3
275 4WD	125,700	500	16,319	32.64	27.80	13,902	30,221	60.44	2.66	14.6
310 4WD	142,000	500	18,420	36.84	30.43	15,217	33,637	67.27	3.01	15.9
360 4WD	155,800	500	20,200	40.40	35.30	17,649	37,848	75.70	3.30	18.6
425 4WD	183,700	500	23,797	47.59	42.75	21,373	45,170	90.34	3.89	22.5
Combine Small	128,300	300	17,124	57.08	33.86	10,157	27,281	90.94	24.71	5.3
Combine Med	137,000	300	18,321	61.07	37.34	11,203	29,524	98.41	26.37	6.4
Combine Large	159,100	300	21,292	70.97	43.89	13,168	34,460	114.87	30.64	7.7
Combine Jumbo	171,800	300	23,010	76.70	51.37	15,411	38,420	128.07	33.08	10.6

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre -----		Operating Expense / Acre	Diesel Fuel Gal/Ac			
				Equipment Tractor +	Machine + Labor + Charge					
Canadian Dollars										
Tillage Equipment										
Chisel Plow 10 Ft	4,784	5.82	582	38.98	3.10	1.44	2.16	6.70	1.78	0.68
Chisel Plow 15 Ft	7,518	8.73	873	62.79	4.29	1.46	1.44	7.19	2.14	0.73
Chisel Plow 17 Ft	8,201	9.89	989	67.39	4.14	1.40	1.27	6.81	2.13	0.75
Chisel Plow 19 Ft	13,258	11.05	1,105	79.74	4.11	1.97	1.13	7.21	2.35	0.77
Chisel Plow 23 Ft	14,901	13.38	1,338	91.06	4.04	1.83	0.94	6.80	2.28	0.75
Chisel Plow 31 Ft	22,963	18.04	1,804	111.05	3.39	2.07	0.70	6.16	1.76	0.66
Chisel Plow 37 Ft	20,279	21.53	2,153	113.24	3.13	1.55	0.58	5.26	1.75	0.74
Chisel Plow 47 Ft	38,415	27.35	2,735	150.06	2.77	2.26	0.46	5.49	1.79	0.68
Chisel Plow 55 Ft	42,376	32.00	3,200	170.91	2.82	2.13	0.39	5.34	1.81	0.70
Chisel Plow, Front Dsk 6 Ft	7,289	3.86	386	42.34	4.67	3.04	3.25	10.96	2.70	1.03
Chisel Plow, Front Dsk 9 Ft	9,391	5.41	541	54.54	4.95	2.82	2.32	10.08	2.73	0.98
Chisel Plow, Front Dsk 11 Ft	10,052	6.95	695	70.00	5.89	2.37	1.80	10.07	2.96	1.07
Chisel Plow, Front Dsk 14 Ft	14,464	8.50	850	86.01	5.91	2.74	1.48	10.12	3.20	1.12
Chisel Plow, Front Dsk 16 Ft	16,281	10.05	1,005	92.64	5.38	2.59	1.25	9.22	2.90	1.00
Chisel Plow, Front Dsk 19 Ft	24,478	11.59	1,159	107.59	4.87	3.33	1.08	9.28	2.70	1.14
Chisel Plow, Disk 21 Ft Fold	25,672	13.14	1,314	120.30	5.12	3.08	0.96	9.16	2.79	1.21
Moldboard Plow 4-18	10,935	2.78	334	46.91	6.49	5.87	4.51	16.86	4.92	1.43
Moldboard Plow 5-18	16,876	3.48	417	64.43	7.69	7.23	3.61	18.53	5.81	1.52
Moldboard Plow 6-18	18,451	4.17	542	76.64	8.98	6.38	3.01	18.37	5.99	1.52
Moldboard Plow 7-18	21,595	4.87	633	84.66	8.42	6.39	2.58	17.39	5.89	1.52
Moldboard Plow 8-18	25,778	5.56	723	95.07	8.16	6.67	2.26	17.09	6.08	1.52
Moldboard Plow 9-18	32,667	6.26	939	118.45	9.78	7.14	2.00	18.92	6.63	1.91
Moldboard Plow 10-18	35,823	6.95	1,043	117.95	8.11	7.05	1.80	16.96	6.46	1.91
Moldboard Plow 12-18	41,004	8.35	1,252	129.13	7.24	6.73	1.50	15.47	6.01	1.75
Reversible Plow 2-18	3,258	1.39	209	31.43	10.24	3.34	9.02	22.60	6.25	2.29
Reversible Plow 5-18	9,530	3.48	522	71.18	13.06	3.80	3.61	20.47	7.61	2.44
Reversible Plow 5-18 HD	12,371	3.48	522	75.17	13.06	4.95	3.61	21.62	8.05	2.44
Reversible Plow 8-18	17,475	5.56	835	98.03	11.00	4.37	2.26	17.62	5.96	2.14
Field Cultivator 12 Ft	6,150	9.02	1,082	39.72	2.00	1.01	1.39	4.41	1.21	0.44
Field Cultivator 18 Ft	8,201	12.98	1,558	51.34	2.06	0.93	0.97	3.95	1.19	0.41
Field Cultivator 28 Ft	14,426	20.19	2,423	78.96	2.25	1.04	0.62	3.91	1.31	0.42
Field Cultivator 37 Ft	22,142	26.68	3,202	105.55	2.29	1.19	0.47	3.96	1.19	0.45
Field Cultivator 47 Ft	27,610	33.90	4,068	108.47	1.66	1.17	0.37	3.20	1.05	0.39
Field Cultivator 60 Ft	36,357	43.27	5,193	131.39	1.55	1.19	0.29	3.04	1.01	0.37
Tandem Disk 9 Ft Rigid	5,795	5.41	541	32.50	1.96	1.73	2.32	6.01	1.14	0.39

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre ----- Tractor + Equipment	Labor Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac
Canadian Dollars								
Tandem Disk 11 Ft Rigid	7,058	6.40	39.16	2.22	1.93	6.12	1.47	0.50
Tandem Disk 15 Ft Rigid	9,521	8.73	55.96	3.07	1.91	6.41	1.82	0.61
Tandem Disk 18 Ft Fold	17,405	10.47	83.31	3.91	2.84	7.95	2.32	0.71
Tandem Disk 21 Ft Fold	20,151	12.22	92.42	3.72	2.82	7.56	2.32	0.69
Tandem Disk H.D. 8 Ft Rigid	12,028	4.65	59.74	5.75	4.39	12.84	3.60	1.14
Tandem Disk H.D. 12 Ft Rigid	11,052	6.98	69.06	5.36	2.73	9.89	2.86	0.91
Tandem Disk H.D. 15 Ft Rigid	12,618	8.73	75.36	4.70	2.50	8.64	2.59	0.85
Tandem Disk H.D. 18 Ft Fold	20,163	10.47	92.53	4.34	3.30	8.83	2.71	0.81
Tandem Disk H.D. 30 Ft Fold	36,107	17.45	149.12	4.34	3.49	8.54	2.76	1.06
Tandem Disk HD 9" Spc 27 Ft	30,056	12.52	127.16	5.37	3.78	10.16	3.01	1.27
Tandem Disk HD 9" Spc 32 Ft	36,637	14.84	146.37	5.10	3.92	9.87	2.97	1.25
Finish Tandem Disk 18 Ft	20,229	9.27	85.45	4.42	3.44	9.21	2.48	0.80
Finish Tandem Disk 21 Ft	22,005	10.82	88.31	3.79	3.21	8.16	2.17	0.69
Finish Tandem Disk 27 Ft	28,430	13.91	118.63	4.40	3.23	8.53	2.19	0.86
Finish Tandem Disk 32 Ft	30,225	16.48	117.44	3.42	2.94	7.12	1.98	0.80
Offset Disk 7 Ft	6,139	3.25	36.58	4.39	3.02	11.27	2.59	0.98
Offset Disk 10.5 Ft	8,555	4.87	44.31	3.71	2.82	9.10	2.21	0.82
Offset Disk 12.5 Ft	11,089	5.80	57.02	4.62	3.06	9.84	2.62	0.91
Offset Disk 16 Ft	18,041	7.42	78.82	5.05	3.88	10.63	2.75	0.86
Offset Disk 18 Ft	17,916	8.35	91.52	6.02	3.45	10.97	3.36	1.14
Offset Disk Wing 21 Ft	24,739	9.74	101.79	5.16	4.01	10.45	3.05	0.98
Offset Disk Wing 23 Ft	29,796	10.66	120.55	5.74	4.39	11.30	2.89	1.12
V-Ripper 20 O.C. 5 Ft	12,301	3.09	69.26	12.12	6.23	22.41	6.54	2.06
V-Ripper 25 O.C. 6.25 Ft	12,301	3.86	69.31	9.69	5.00	17.94	5.24	1.65
V-Ripper 25 O.C. 7.5 Ft	12,301	4.64	72.87	8.84	4.17	15.72	4.83	1.60
V-Ripper 25 O.C. 10 Ft	12,301	6.18	73.32	6.63	3.20	11.86	3.62	1.20
V-Ripper 25 O.C. 14 Ft	15,035	8.65	90.81	6.25	2.80	10.49	3.51	1.16
V-Ripper 25 O.C. 18 Ft	21,869	11.13	104.04	5.07	3.15	9.35	2.95	1.19
V-Ripper 25 O.C. 25 Ft	23,236	15.45	117.53	4.35	2.44	7.60	2.48	1.03
V-Ripper 30 O.C. 12.5 Ft	10,252	7.73	74.70	5.88	2.17	9.67	3.20	1.10
V-Ripper 30 O.C. 17 Ft	12,984	10.51	87.85	5.14	2.02	8.36	2.83	0.96
V-Ripper 30 O.C. 22.5 Ft	19,136	13.91	119.54	5.44	2.25	8.59	3.01	1.33
Comb Fld Cult Incorpor 16 Ft	24,978	11.54	99.80	3.94	3.62	8.65	2.58	0.73
Comb Fld Cult Incorpor 19 Ft	28,351	13.70	110.34	3.66	3.47	8.05	2.44	0.70
Comb Fld Cult Incorpor 23 Ft	31,732	16.59	119.99	3.26	3.22	7.23	2.18	0.61
Comb Fld Cult Incorpor 26 Ft	32,257	18.03	123.37	3.13	3.02	6.84	2.02	0.73
Comb Fld Cult Incorpor 33 Ft	39,228	23.80	146.12	2.83	2.79	6.14	1.84	0.67
Comb Disk & V-Ripper 12.5 Ft	22,255	6.44	108.64	9.50	5.42	16.87	4.50	1.85

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre ----- Equipment Tractor +	Labor Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac
Canadian Dollars								
Comb Disk & V-Ripper 17.5 Ft 360 4WD	28,452	9.02	133.16	8.40	4.98	14.77	4.67	2.06
Disk,Flid Cult Finish 13 Ft 130 MFWD	13,887	9.79	72.88	3.83	2.34	7.45	1.98	0.65
Disk,Flid Cult Finish 22 Ft 180 MFWD	25,156	9.79	102.97	5.13	4.11	10.52	3.04	0.97
Disk,Flid Cult Finish 30 Ft 260 4WD	33,623	15.45	122.44	3.65	3.46	7.92	2.17	0.86
Disk,Flid Cult Finish 38 Ft 310 4WD	40,395	9.79	143.95	6.87	6.55	14.71	4.10	1.62
Roller Harrow 12 Ft 75	10,631	7.42	47.84	2.43	2.32	6.45	1.52	0.54
Roller Harrow 28 Ft 180 MFWD	27,685	17.31	106.68	2.90	2.54	6.16	1.75	0.55
Springtooth Drag 30 Ft 60	9,431	21.64	68.35	0.66	1.89	3.16	0.41	0.15
Springtooth Drag 48 Ft 75	11,891	34.62	77.47	0.52	1.33	2.24	0.33	0.11
Spring Tooth Drag 58 Ft 105 MFWD	13,941	41.83	61.60	0.64	0.54	1.47	0.41	0.13
Planting Equipment								
Row Crop Planter 4-36 40	12,438	5.60	55.12	1.89	4.70	9.84	1.42	0.38
Row Crop Planter 6-30 60	21,869	7.00	78.11	2.03	6.52	11.16	1.78	0.45
Row Crop Planter 8-30 75	25,969	9.33	90.46	1.93	5.81	9.69	1.63	0.43
Row Crop Planter 12-30 105 MFWD	42,371	14.00	133.23	1.91	6.30	9.52	1.66	0.38
Min-Til Planter 4-36 60	21,459	5.09	77.14	2.80	8.78	15.15	2.42	0.62
Min-Til Planter 6-30 75	29,386	6.36	90.94	2.84	8.59	14.29	2.59	0.62
Min-Til Planter 8-30 105 MFWD	37,040	8.48	121.72	3.15	9.05	14.35	2.57	0.62
Min-Til Planter 12-30 160 MFWD	69,980	12.73	172.54	3.57	8.56	13.56	3.27	0.67
Min-Til Planter 16-30 200 MFWD	94,993	12.73	195.68	4.25	9.70	15.37	4.40	0.79
Potato Planter Filler None	14,899	5.75	38.73	0.00	6.74	6.74	0.73	0.02
Potato Row Marker 4 Row 130 MFWD	13,668	4.98	98.45	7.52	8.34	19.77	3.47	1.28
Potato Row Marker 6 Row 150 MFWD	21,869	7.47	126.88	5.49	8.89	16.99	2.70	0.99
Potato Row Marker 8 Row 160 MFWD	27,336	10.79	148.12	4.21	7.71	13.72	2.20	0.79
Potato Planter 4 Row 130 MFWD	41,004	3.83	173.58	9.78	26.47	45.32	6.65	1.66
Potato Planter 6 Row 150 MFWD	54,672	5.75	211.02	7.13	23.55	36.73	5.36	1.29
Potato Planter 8 Row 160 MFWD	75,174	8.30	266.27	5.47	22.42	32.07	4.65	1.02
Beet Planter 12 Row 105 MFWD	34,580	4.67	127.58	5.73	17.43	27.34	4.44	1.14
Grain Drill 25 Ft 130 MFWD	34,580	10.61	119.37	3.53	6.08	11.26	2.38	0.60
Grain Drill 30 Ft 150 MFWD	40,867	12.73	134.49	3.22	5.98	10.57	2.28	0.58
Grain Drill 35 Ft 160 MFWD	42,507	14.85	142.01	3.06	5.33	9.56	2.19	0.57
Presswheel Drill 12 Ft 75	21,185	5.09	76.99	3.54	8.16	15.12	2.79	0.78
Presswheel Drill 16 Ft 105 MFWD	27,610	6.79	98.25	3.94	7.97	14.47	2.90	0.78
Presswheel Drill 20 Ft 130 MFWD	33,487	8.48	120.48	4.41	7.73	14.20	2.91	0.75
Presswheel Drill 24 Ft 150 MFWD	41,414	10.18	139.49	4.03	7.96	13.70	2.84	0.73
Presswheel Drill 30 Ft 160 MFWD	51,939	12.73	159.17	3.57	7.57	12.51	2.76	0.67
Presswheel Drill 40 Ft 180 MFWD	65,880	16.97	189.67	2.96	7.19	11.18	2.43	0.56

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre ----- Equipment Tractor +	Labor Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac
Canadian Dollars								
Air Seeder Drill 28 Ft	76,540	11.88	950	208.88	4.23	11.89	1.47	17.58
Air Seeder Drill 36 Ft	88,842	15.27	1,222	237.78	3.69	10.74	1.14	15.57
No-Till Drill 15 Ft	47,291	6.36	509	145.78	6.44	13.73	2.74	22.91
No-Till Drill 21 Ft	52,076	8.91	713	163.98	5.64	10.81	1.96	18.41
No-Till Drill 30 Ft	57,269	12.73	1,018	177.54	4.25	8.33	1.37	13.95
Crop Maintenance Equipment								
Cultivator 4-36	6,173	6.18	618	40.23	2.92	1.52	2.07	6.51
Cultivator 6-30	5,194	7.73	773	35.07	1.84	1.04	1.66	4.54
Cultivator 8-30	6,946	10.30	1,030	64.56	3.98	1.05	1.24	6.27
Cultivator 8-38	6,946	13.05	1,305	64.56	3.14	0.83	0.98	4.95
Cultivator 12-30	13,134	15.45	1,545	82.82	3.25	1.28	0.83	5.36
Cultivator 16-30	16,354	20.61	2,061	91.56	2.62	1.20	0.62	4.44
Cultivator 24-22	36,658	22.67	2,267	128.45	2.70	2.40	0.56	5.67
Cultivator Hi Res 4-36	6,892	6.18	618	41.41	2.92	1.69	2.09	6.70
Cultivator Hi Res 6-30	10,252	7.73	773	54.96	3.46	2.00	1.66	7.11
Cultivator Hi Res 8-30	15,898	10.30	1,030	86.77	4.87	2.31	1.24	8.42
Cultivator Hi Res 8-38	15,898	13.05	1,305	86.77	3.85	1.82	0.98	6.65
Cultivator Hi Res 12-30	22,012	15.45	1,545	108.78	3.96	2.12	0.96	7.04
Rotary Hoe 15 Ft	4,211	18.55	1,855	37.97	0.97	0.38	0.69	2.05
Rotary Hoe 21 Ft	8,064	25.96	2,596	53.02	1.03	0.52	0.49	2.04
Rotary Hoe 30 Ft	8,135	37.09	3,709	67.51	1.11	0.37	0.34	1.82
Potato Cultivator 4 Row	5,194	5.36	778	37.28	3.37	1.20	2.39	6.95
Potato Cultivator 6 Row	7,928	8.04	1,126	49.63	3.33	1.25	1.59	6.17
Sugar Beet Cult 12 Row	11,618	5.60	336	65.69	4.78	4.67	2.28	11.73
S-P Boom Sprayer 47 Ft	65,607	25.92	2,592	135.85	0.00	4.48	0.76	5.24
S-P Boom Sprayer 60 Ft	68,066	33.09	3,309	140.27	0.00	3.65	0.59	4.24
Sprayer 30 Ft	5,057	15.36	1,229	41.38	0.69	0.73	1.28	2.69
Boom Sprayer 50 Ft	6,423	25.61	2,561	46.06	0.56	0.48	0.77	1.80
Sprayer Hi Pres 50 Ft	27,063	23.64	2,364	82.37	0.60	2.05	0.83	3.49
Anhydrous Appl. 30 Ft	21,049	12.73	509	141.70	3.57	6.28	1.29	11.13
Fert. Sprd 4 T/40 Ft	10,935	23.76	713	83.32	0.60	2.22	0.69	3.51
Corn Stalk Chopper 12 Ft	9,704	4.65	465	44.17	3.06	3.52	2.91	9.49
Corn Stalk Chopper 15 Ft	11,378	5.82	582	59.62	4.60	3.32	2.33	10.25
Potato Shredder 18 Ft	14,530	6.98	698	79.28	5.87	3.55	1.94	11.36
Stalk Shredder 20 Ft	16,928	7.76	776	79.93	4.83	3.73	1.74	10.30
Rock Picker 6 Ft	14,214	1.42	85	73.53	12.72	28.71	10.41	51.85
								12.43
								2.80

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	Total Cost /Hour	----- Total Cost/Acre ----- Equipment Tractor +	Labor Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac
Canadian Dollars								
Harvesting Equipment								
Mower-Conditioner 9 Ft	13,258	4.36	48.53	2.43	5.59	3.10	11.12	0.49
Rotary Hay Mower 6 Ft	6,698	2.91	35.98	3.64	4.50	4.23	12.37	0.73
Rotary Mow/Cond 9 Ft	19,409	4.36	66.42	4.14	8.13	2.96	15.22	0.91
Hay Rake (Hyd) 9 Ft	5,194	3.49	27.99	3.04	1.46	3.52	8.02	0.61
Hay Swather-Cond 12 Ft	63,556	5.82	154.52	0.00	24.44	2.11	26.56	0.48
Swather-Cond 15 Ft	66,290	7.27	161.20	0.00	20.47	1.69	22.17	0.43
Grain Swather 18 Ft Pull Type	12,165	8.73	58.16	2.07	3.19	1.41	6.66	0.46
Grain Swather 21 Ft Pull Type	18,290	10.18	71.49	1.77	4.04	1.21	7.02	0.39
Grain Swather 21 Ft Self-Prop	54,672	10.18	136.78	0.00	12.23	1.21	13.43	0.30
Hay Baler Pto Twine	18,041	3.78	49.60	2.80	5.70	4.61	13.11	0.56
Round Baler 1000 Lb	17,768	3.01	57.38	4.72	9.78	4.53	19.04	1.06
Round Baler 1500 Lb	23,236	4.64	66.41	3.07	8.31	2.94	14.32	0.69
Rd Baler/Wrapper 1000 Lb	25,422	3.01	69.98	4.72	13.97	4.53	23.22	1.06
Rd Bale Wrapper Silage	18,999	2.48	58.00	5.74	12.68	4.96	23.37	1.28
Bale Wrapper Dry Hay	8,884	2.48	37.71	4.27	5.97	4.96	15.19	0.85
Forage Harvester 2 Row	29,000	1.65	86.92	16.17	25.83	10.53	52.53	3.20
Forage SP Harvstr 2 Row	170,850	2.04	186.61	0.00	83.08	8.56	91.64	2.41
Forage SP Harvstr 3 Row	211,854	3.05	227.64	0.00	68.82	5.71	74.53	2.06
Large Forage Blower	6,288	1.00	43.68	14.24	17.14	12.30	43.68	3.18
Combine Grain Head Small	12,711	4.41	118.45	20.61	2.29	3.95	26.85	1.20
Combine Grain Hd Medium	15,445	5.09	128.07	19.33	2.40	3.42	25.16	1.25
Combine Grain Head Large	21,459	6.79	149.25	16.92	2.50	2.57	21.99	1.13
Soybean Combine Hd Small	15,308	3.86	120.49	23.55	3.14	4.51	31.21	1.37
Soybean Combine Hd Medium	18,726	4.45	130.64	22.09	3.32	3.91	29.33	1.43
Soybean Combine Hd Large	25,832	5.35	152.71	21.49	3.82	3.26	28.57	1.44
Corn Combine 4-36 Medium	19,136	3.36	131.01	29.29	4.51	5.19	38.99	1.89
Corn Combine 4-30 Medium	22,278	2.80	133.41	35.15	6.28	6.22	47.65	2.27
Corn Combine 6-30 Large	29,659	4.20	155.72	27.35	5.58	4.15	37.08	1.83
Corn Combine 8-30 Large	34,990	5.09	159.97	22.56	5.44	3.42	31.42	1.51
Corn Combine 12-30 Jumbo	52,895	7.64	187.15	16.77	5.46	2.28	24.51	1.39
Potato Windrower 2 Row	35,537	1.49	86.76	12.08	37.11	8.89	58.08	2.66
Potato Windrower 4 Row	77,908	2.99	160.48	8.95	40.32	4.45	53.72	1.77
Potato Harvester Seed 2 Row	75,174	1.38	156.81	27.16	50.02	36.53	113.72	4.61
Potato Harvester Seed 4 Row	118,912	2.76	200.26	14.86	39.49	18.27	72.61	2.69
Potato Harvester 2 Row	61,506	1.84	154.44	20.37	36.23	27.40	84.00	3.46
Disk Bean Top Cutter 6R	14,624	6.40	71.78	4.18	4.31	2.72	11.22	0.83

Tractor Size (HP)	Net Cost of A New Implement	-- Estimated -- Work Performed Acres/hr	--- Ac/yr	Total Cost /Hour	----- Total Cost/Acre ----- Tractor + Equipment	Labor + Charge	Total Dollars	Operating Expense / Acre	Diesel Fuel Gal/Ac
Canadian Dollars									
Sugar Beet Lifter 4 Row	53,442	3.47	277	167.99	7.72	5.03	48.48	14.18	1.53
Sugar Beet Lifter 6 Row	69,707	5.20	520	197.02	7.20	3.35	37.89	12.91	1.22
Sugar Beet Topper 6 Row	21,185	5.33	427	75.74	3.38	2.94	14.20	2.92	0.75
Sugar Beet Topper 12 Row	41,004	10.67	853	137.80	3.84	1.47	12.92	2.95	0.70
Sugar Beet Wagon 8 Ton	11,345	3.47	277	51.64	5.21	3.55	14.90	3.23	1.15
Sugar Beet Wagon 20 Ton	45,104	5.20	520	130.91	9.66	2.37	25.17	6.61	1.83
Sugar Beet Wagon 24 Ton	47,837	5.20	520	145.97	11.77	2.37	28.07	6.72	2.29
Manure Spreader 150 Bu	6,150	3.49	349	43.85	5.17	3.59	12.56	3.87	1.14
Manure Spreader 300 Bu	7,654	3.49	349	55.81	7.66	3.59	15.99	5.30	1.52
Manure Spreader 400 Bu	15,308	4.65	465	82.79	8.05	2.70	17.79	6.02	1.37
Gravity Grain Box 185 Bu	2,871	1.65	215	30.74	8.61	7.43	18.58	4.62	1.92
Gravity Grain Box 240 Bu	3,690	1.65	215	35.58	10.91	7.43	21.50	5.82	2.40
Belt Bottom V Box 24 Ft	24,329	1.65	215	71.67	17.49	7.43	43.32	9.64	2.85
Baled Hay Wagon	3,417	3.78	945	38.34	2.80	6.50	10.14	1.55	0.56
Forage Wagon 14 Ft	11,618	1.65	215	37.66	6.41	7.43	22.76	4.62	1.28
Forage Wagon 16 Ft	12,984	1.65	215	39.15	6.41	7.43	23.66	4.82	1.28
1 Ton Hay Stack	26,242	4.15	829	62.79	3.43	4.20	15.15	5.12	0.77
3 Ton Hay Stack	38,817	4.84	1,064	80.88	3.73	3.60	16.72	6.52	0.82
6 Ton Hay Stack	62,736	5.53	1,548	117.55	4.84	3.15	21.27	10.36	0.96