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MACHINERY COST ESTIMATES

The tables in this publication contain estimates of farm machinery operation costs calculated via an economic engineering approach. The data are intended to show a representative farming industry cost for specified machines and operations.

Machine costs are separated into time-related and use-related categories. Use-related costs are incurred only when a machine is used. They include fuel, lubrication, use-related repairs and labor. Time-related costs, also often referred to as overhead costs, accrue to the owner whether or not a machine is used. Overhead includes time-related economic costs: interest, insurance, personal property taxes, and housing. There are no personal property taxes in Minnesota. Depreciation is both a use- and a time-related cost. Depreciation will be related to use to the extent that increased annual usage shortens years of life and/or reduces salvage value. While not entirely use-related, depreciation is included along with operating expenses and labor costs in the columns labeled "use-related cost/acre".

OVERHEAD COSTS: Time-related costs are prorated over a 12 year economic life except where otherwise indicated. Trade-in values are estimated based on American Society of Agricultural Engineers formulas. Income tax implications are ignored. A housing charge of 67 cents per square foot of shelter space needed per year is made.

A six percent “real” (inflation-adjusted) interest rate is used in the cost estimates. This real rate is calculated by taking a nominal rate charged by lenders, minus a measure of the inflation rate per year expected over the years of ownership. Insurance is charged at 0.85 percent of the undepreciated value. The interest and insurance cost formulas are slightly different from those used in previous years. Adding one year's depreciation to the numerator in effect bases the costs on the value at the beginning of each year owned. This gives a slightly more accurate calculation of the actual costs over the years owned. In states where farm machinery is taxed as personal property, property tax could be calculated in a similar manner, depending on how taxes are assessed.

Formulas used to compute machinery overhead costs:

$$\text{Interest, \$/year} = \frac{\text{purchase cost + salvage value + depreciation (\$/year)}}{2} \times \text{“real” interest rate}$$

$$\text{Insurance, \$/year} = \frac{\text{purchase cost + salvage value + depreciation (\$/year)}}{2} \times \text{insurance rate}$$

Housing, $/year = price per sq. foot x sq. feet shelter space required

Taxes per year = 0 (no taxes on personal property in Minnesota)

USE-RELATED COSTS: Fuel cost is calculated by multiplying the fuel consumption by the price of fuel, with fuel consumption assumed to be 0.044 gallons of diesel fuel per PTO horsepower-hour on average for each implement type. Fuel consumption per acre is averaged across sizes within a given implement type. The price of farm diesel fuel is projected at $2.25 per gallon. All power units, tractors, combines, trucks, etc., use diesel fuel. Lubrication cost is assumed to be 10 percent of fuel cost.

A related spreadsheet, MACHDATA.XLS, is available at:
http://www.apec.umn.edu/faculty/wlazarus/documents/Machdata.xls.

The formulas for repair and maintenance costs estimate total accumulated repair costs based on accumulated hours of lifetime use. Repair and maintenance calculations are based on American Society of Agricultural Engineers formulas. The total cost is then divided by accumulated hours to arrive at 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 30 percent benefits. Charge rates are $14.00 per hour for unskilled labor and $17.50 per hour for skilled labor. The skilled labor rate is generally used with the planting and harvesting equipment and sprayers. 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. A small amount of extra labor is added over and above machine time to allow for downtime for tasks such as making adjustments and filling sprayers and planters. The labor adjustment ranges from 2 percent additional time for tillage to 33 percent for spraying.

Economic depreciation is included in use-related costs, calculated using the straight-line formula:

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

These estimates will not represent any given individual's cost. Differences in buying power, repair programs, average annual use, and overall replacement programs should be considered when making adjustments. It may be useful to record actual expenses for at least a few of your implements and compare your costs to these estimates. These estimates will differ from records because they are estimates, but also because they are averaged over the use period and are expressed in today's dollars. If these estimates are compared to recorded costs that include repairs or depreciation based on historical costs, one adjustment that would be required for comparability would be to index the historical cost to current prices.

THE BOTTOM LINE: 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 and use-related depreciation 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 Use-related costs and total costs.

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Summary of Per Acre Use-Related Costs and Total Cost for Implements with Associated Power Units, Averaged Over All Sizes by Implement Type

	Use-Related Cost/Acre[1]	Total Cost/Acre
Chisel Plow	$6.26	$8.72
Chisel Plow, Front Dsk	$8.55	$11.76
Moldboard Plow	$13.82	$17.96
Field Cultivator	$3.77	$5.20
Tandem Disk	$6.05	$8.22
Tandem Disk H.D.	$6.92	$9.53
Offset Disk	$8.99	$11.78
V-Ripper	$8.15	$10.90
Comb Disk & V-Ripper	$12.30	$17.05
Rotary Harrow	$1.50	$2.03
Field Aerator (For Manure)	$6.02	$8.06
Row Crop Planter	$6.86	$10.02
Min-Til Planter	$8.81	$12.17
Potato Planter	$25.71	$37.98
Beet Planter	$18.50	$27.48
Beet Planter, Vacuum	$8.58	$14.60
Presswheel Drill	$8.25	$11.28
Air Seeder Drill w/Cart	$10.55	$15.90
No-Till Drill	$11.34	$15.77
Prairie Grass Drill	$10.81	$16.27
Row Cultivator	$4.26	$5.60
Cultivator High Residue	$7.22	$9.99
Rotary Hoe	$1.79	$2.30
Potato Cultivator	$5.95	$7.49
Sugar Beet Cult	$9.42	$13.42
Boom Sprayer, Self-Prop	$3.69	$5.18
Boom Sprayer	$2.06	$2.64
Stalk Shredder	$8.70	$11.61
Mower-Conditioner	$9.49	$12.95
Rotary Mow/Cond	$6.14	$8.51
Hay Rake (Hyd)	$4.38	$5.38
Hay Swather-Cond	$7.47	$10.63
Swather-Cond, Self-Prop	$12.91	$20.73
Grain Swather, Self-Prop	$9.37	$15.05
Hay Baler PTO Twine	$10.22	$12.12
Round Baler	$6.12	$7.08
Rd Baler/Wrap	$8.25	$9.76
Large Rectangular Baler 3x3	$11.83	$16.80
Large Rectangular Baler 4x3	$13.46	$19.29
Forage Harvester (Corn Head)	$44.00	$55.21
Forage Harvester (Pickup Head)	$17.92	$22.42
Corn Head for SP Harvstr Base	$33.56	$50.18
Pickup Head for SP Harvstr Base	$21.91	$32.40
Combine Corn Hd	$31.25	$40.38
Combine Grain Head	$18.13	$23.03
Combine Soybean Hd	$24.37	$30.79
Combine Belt Pickup Hd	$22.34	$28.77
Potato harvester	$71.00	$85.55
Bean Cutter	$7.29	$9.50
Bean Rod	$6.52	$8.27
Bean Windrower	$9.47	$13.01
Sugar Beet Lifter	$49.79	$65.18
Sugar Beet Topper	$10.07	$14.02
Sugar Beet Wagon	$21.60	$30.58

[1] Use-related cost/acre includes fuel, lubricants, repairs and maintenance, labor, and power and implement depreciation (depreciation is both time-related and use-related). The difference between use-related cost and total cost is that total cost also includes overhead costs (interest, insurance, and housing).

Tractor, combine or Forage Harvester HP[1]	Net Cost of a New Power Unit[2]	Annual Hours of Use	Fuel & Oil Cost Per Hour	Maintenance & Repair Cost/Hr	Depreciation Cost Per Hour	-- Overhead[3] -- Cost Per Year	-- Overhead[3] -- Cost Per Hour	Total Cost Per Year Of Use	Total Cost Per Hour Of Use	Diesel Use/Hr Gallons
Tractors, Combines, and Self-Propelled Forage Harvesters (Without Heads)										
40	$20,000	400	$4.36	$0.67	$2.66	$1,031	$2.58	$4,105	$10.26	1.76
60	24,000	400	6.53	0.81	3.19	1,233	3.08	5,444	13.61	2.64
75	32,000	400	8.17	1.13	4.12	1,648	4.12	7,016	17.54	3.30
105 MFWD	73,000	450	11.43	2.19	9.85	3,415	7.59	13,979	31.06	4.62
130 MFWD	101,000	450	14.16	3.03	13.63	4,695	10.43	18,562	41.25	5.72
160 MFWD	119,000	500	17.42	3.97	14.53	5,548	11.10	23,509	47.02	7.04
200 MFWD	151,000	500	21.78	5.03	18.44	7,010	14.02	29,637	59.27	8.80
225 MFWD	172,000	400	24.50	4.59	25.95	8,038	20.09	30,055	75.14	9.90
260 4WD (226 PTO)	180,000	400	24.63	2.88	27.16	8,404	21.01	30,274	75.68	9.95
310 4WD (270 PTO)	186,000	400	29.37	2.98	28.07	8,678	21.70	32,844	82.11	11.87
360 4WD (313 PTO)	201,000	400	34.11	3.22	30.33	9,365	23.41	36,427	91.07	13.78
425 4WD (370 PTO)	235,000	400	40.27	3.76	35.46	10,921	27.30	42,716	106.79	16.27
225 Tracked Tractor	163,000	400	24.50	2.61	24.60	7,626	19.06	28,309	70.77	9.90
275 HP Combine	227,000	300	29.95	37.87	49.65	10,205	34.02	45,446	151.49	12.10
340 HP Combine	253,000	300	37.03	42.21	55.34	11,410	38.03	51,783	172.61	14.96
315 HP SP Forage Harvester Base Unit	208,000	200	18.71	15.76	60.54	10,020	50.10	29,024	145.12	7.56
570 HP SP Forage Harvester Base Unit	309,000	200	33.86	23.42	89.94	14,724	73.62	44,168	220.84	13.68

[1]HP shown for the smaller tractors is PTO horsepower. Engine HP is shown for the larger tractors. PTO HP for the larger tractors runs about 87% of engine HP, and is shown in parentheses. Fuel use is estimated at 0.044 gallons of diesel fuel per hour per PTO HP.

[2]Net cost of a new unit assumes no trade-in. Farm machinery is exempt from sales tax in Minnesota so no sales tax is included.

[3]Overhead costs include interest, insurance, and housing but not depreciation, which is shown separately because it varies to some extent with use. Overhead per hour will vary with annual use.

	Tractor	Net Cost	--Estimated--				Labor	--Implement Cost/Acre--			Total	Use-related	Diesel
	Size	of a New	Work-Performed		-Power Cost/Acre[2]-		Cost		Deprec-		Cost	Cost	Fuel
	(HP)	Implement[1]	Acres/hr	Acres/yr	Fuel	Other	Per Acre	Repairs	iation	Overhead[3]	Per Acre[4]	Per Acre[5]	Gal/Acre
Tillage Equipment													
Chisel Plow 15 Ft	130 MFWD	$17,000	8.50	680	$1.50	$3.19	$1.68	$0.61	$1.42	$1.40	$ 9.79	$ 7.17	0.60
Chisel Plow 23 Ft	200 MFWD	$33,000	13.03	1,043	$1.50	$2.88	$1.10	$0.77	$1.79	$1.65	$ 9.69	$ 6.96	0.60
Chisel Plow 37 Ft	310 4WD (270 PTO)	$41,000	20.97	1,677	$1.50	$2.52	$0.68	$0.60	$1.39	$1.30	$ 7.98	$ 5.64	0.60
Chisel Plow 57 Ft	425 4WD (370 PTO)	$67,000	32.30	2,584	$1.50	$2.06	$0.44	$0.63	$1.47	$1.32	$ 7.42	$ 5.26	0.60
Chisel Plow, Front Dsk 16.3 Ft	200 MFWD	$20,000	9.21	737	$2.40	$4.07	$1.55	$0.42	$1.60	$1.46	$ 11.51	$ 8.53	0.97
Chisel Plow, Front Dsk 21.3 Ft Fold	310 4WD (270 PTO)	$31,000	12.04	963	$2.40	$4.38	$1.19	$0.50	$1.90	$1.65	$ 12.01	$ 8.56	0.97
Moldboard Plow 6 Bottom-18, 9 Ft	130 MFWD	$18,000	4.17	501	$3.19	$6.49	$3.42	$1.86	$2.04	$1.87	$ 18.87	$ 14.50	1.29
Moldboard Plow 8 Bottom-18, 12 Ft	160 MFWD	$25,000	5.56	668	$3.19	$5.32	$2.57	$1.94	$2.12	$1.92	$ 17.05	$ 13.14	1.29
Field Cultivator 18 Ft	105 MFWD	$20,000	12.98	1,298	$0.78	$1.51	$1.10	$0.50	$0.87	$0.83	$ 5.60	$ 4.18	0.32
Field Cultivator 23 Ft	130 MFWD	$28,000	16.59	1,659	$0.78	$1.63	$0.86	$0.54	$0.96	$0.88	$ 5.66	$ 4.15	0.32
Field Cultivator 47 Ft	260 4WD (226 PTO)	$58,000	33.90	3,390	$0.78	$1.51	$0.42	$0.55	$0.97	$0.89	$ 5.12	$ 3.61	0.32
Field Cultivator 60 Ft	310 4WD (270 PTO)	$64,000	43.27	4,327	$0.78	$1.22	$0.33	$0.48	$0.84	$0.76	$ 4.41	$ 3.15	0.32
Tandem Disk 21 Ft Rigid	160 MFWD	$29,000	12.22	1,222	$1.22	$2.42	$1.17	$0.79	$1.35	$1.26	$ 8.22	$ 6.05	0.49
Tandem Disk H.D. 30 Ft Fold	360 4WD (313 PTO)	$43,000	17.45	1,745	$1.95	$3.26	$0.82	$0.82	$1.40	$1.27	$ 9.53	$ 6.92	0.79
Offset Disk 12 Ft	105 MFWD	$15,000	5.56	556	$2.06	$3.53	$2.57	$0.61	$1.59	$1.43	$ 11.78	$ 8.99	0.83
V-Ripper 25 " O.C., 10 Ft	160 MFWD	$11,000	6.18	618	$2.46	$4.79	$2.31	$0.57	$1.01	$1.00	$ 12.14	$ 9.34	0.99
V-Ripper 25 " O.C., 18 Ft	260 4WD (226 PTO)	$21,000	11.13	1,113	$2.46	$4.59	$1.28	$0.61	$1.07	$1.04	$ 11.05	$ 8.12	0.99
V-Ripper 30 " O.C., 17 Ft	260 4WD (226 PTO)	$15,000	10.51	1,051	$2.46	$4.86	$1.36	$0.46	$0.81	$0.83	$ 10.77	$ 7.94	0.99
V-Ripper 30 " O.C., 22.5 Ft	360 4WD (313 PTO)	$20,000	13.91	1,391	$2.46	$4.10	$1.03	$0.46	$0.82	$0.79	$ 9.65	$ 7.17	0.99
Comb Disk & V-Ripper 17.5 Ft	360 4WD (313 PTO)	$36,000	9.02	902	$3.63	$6.32	$1.58	$0.91	$2.36	$2.04	$ 16.83	$ 12.20	1.47
Comb Disk & V-Ripper 22.5 Ft	425 4WD (370 PTO)	$59,000	11.59	1,159	$3.63	$5.74	$1.23	$1.16	$3.00	$2.51	$ 17.26	$ 12.40	1.47
Rotary Harrow 30 Ft	75	$23,000	30.91	3,091	$0.26	$0.30	$0.46	$0.17	$0.44	$0.39	$ 2.03	$ 1.50	0.11
Field Aerator (For Manure) 15 Ft	130 MFWD	$18,800	10.05	1,005	$1.41	$2.70	$1.42	$0.43	$1.10	$1.00	$ 8.06	$ 6.02	0.57

	Tractor	Net Cost	--Estimated--				Labor	--Implement Cost/Acre--			Total	Use-related	Diesel
	Size	of a New	Work-Performed		-Power Cost/Acre[2]-		Cost		Deprec-		Cost	Cost	Fuel
	(HP)	Implement[1]	Acres/hr	Acres/yr	Fuel	Other	Per Acre	Repairs	iation	Overhead[3]	Per Acre[4]	Per Acre[5]	Gal/Acre
Planting Equipment													
Row Crop Planter 6 Row-30, 15 Ft	60	$18,000	7.00	490	$0.85	$1.01	$2.90	$0.75	$1.78	$2.08	$ 9.37	$ 6.85	0.34
Row Crop Planter 8 Row-30, 20 Ft	75	$31,000	9.33	653	$0.85	$1.00	$2.18	$0.97	$2.30	$2.59	$ 9.89	$ 6.86	0.34
Row Crop Planter 12 Row-30, 30 Ft	105 MFWD	$53,000	14.00	980	$0.85	$1.40	$1.45	$1.11	$2.62	$2.92	$ 10.35	$ 6.89	0.34
Row Crop Planter 16 Row-30, 40 Ft	130 MFWD	$76,000	18.67	1,307	$0.85	$1.45	$1.09	$1.19	$2.82	$3.08	$ 10.47	$ 6.84	0.34
Min-Til Planter 6 Row-30, 15 Ft	75	$25,000	6.36	509	$1.32	$1.47	$3.19	$1.34	$2.38	$2.69	$ 12.39	$ 9.05	0.53
Min-Til Planter 8 Row-30, 20 Ft	105 MFWD	$31,000	8.48	594	$1.32	$2.31	$2.39	$1.07	$2.53	$2.85	$ 12.48	$ 8.73	0.53
Min-Til Planter 12 Row-30, 30 Ft	160 MFWD	$68,000	12.73	1,273	$1.32	$2.33	$1.60	$2.32	$2.59	$2.81	$ 12.96	$ 9.28	0.53
Min-Til Planter 16 Row-30, 40 Ft	200 MFWD	$76,000	16.97	2,206	$1.32	$2.21	$1.20	$2.59	$1.67	$1.85	$ 10.84	$ 8.16	0.53
Potato Planter 4 Row, 12.6 Ft	130 MFWD	$43,000	3.83	214	$2.81	$7.07	$10.20	$2.58	$9.71	$10.24	$ 42.61	$ 29.64	1.14
Potato Planter 6 Row, 19 Ft	130 MFWD	$65,000	5.75	322	$2.81	$4.72	$6.80	$2.60	$9.78	$10.33	$ 37.04	$ 24.89	1.14
Potato Planter 8 Row, 25.3 Ft	160 MFWD	$86,000	7.67	429	$2.81	$3.86	$5.09	$2.58	$9.70	$10.26	$ 34.30	$ 22.60	1.14
Beet Planter 12 Row, 22 Ft	105 MFWD	$39,000	4.67	280	$2.45	$4.21	$4.65	$2.07	$6.75	$7.36	$ 27.48	$ 18.50	0.99
Beet Planter, Vacuum 24 Row, 44 Ft	160 MFWD	$107,000	22.40	1,008	$0.78	$1.32	$0.97	$0.86	$5.14	$5.53	$ 14.60	$ 8.58	0.31
Presswheel Drill 16 Ft	105 MFWD	$16,000	6.79	509	$1.51	$2.89	$2.86	$0.75	$1.69	$1.71	$ 11.42	$ 8.58	0.61
Presswheel Drill 20 Ft	130 MFWD	$20,000	8.48	636	$1.51	$3.19	$2.29	$0.75	$1.69	$1.71	$ 11.14	$ 8.20	0.61
Presswheel Drill 25 Ft	130 MFWD	$34,000	10.61	795	$1.51	$2.55	$1.83	$1.02	$2.29	$2.26	$ 11.47	$ 8.23	0.61
Presswheel Drill 30 Ft	160 MFWD	$44,000	12.73	1,018	$1.51	$2.33	$1.53	$1.18	$2.32	$2.24	$ 11.10	$ 7.99	0.61
Air Seeder Drill w/Cart 52 Ft	260 4WD (226 PTO)	$157,000	22.06	1,765	$1.12	$2.31	$0.88	$2.42	$4.77	$4.40	$ 15.90	$ 10.55	0.45
No-Till Drill 15 Ft	130 MFWD	$33,000	6.36	509	$2.00	$4.26	$3.05	$1.76	$3.48	$3.34	$ 17.89	$ 12.91	0.81
No-Till Drill 20 Ft	160 MFWD	$36,000	8.48	679	$2.00	$3.49	$2.29	$1.44	$2.85	$2.76	$ 14.82	$ 10.75	0.81
No-Till Drill 30 Ft	200 MFWD	$63,000	12.73	1,018	$2.00	$2.95	$1.53	$1.68	$3.32	$3.15	$ 14.62	$ 10.37	0.81
Prairie Grass Drill 10 Ft	60	$24,000	5.15	258	$1.16	$1.37	$3.53	$0.94	$5.00	$4.76	$ 16.77	$ 11.42	0.47
Prairie Grass Drill (Twinned) , 21 Ft	105 MFWD	$53,000	10.82	541	$1.16	$1.81	$1.68	$0.99	$5.26	$4.85	$ 15.77	$ 10.21	0.47

	Tractor	Net Cost	--Estimated--				Labor	--Implement Cost/Acre--			Total	Use-related	Diesel
	Size	of a New	Work-Performed		-Power Cost/Acre[2]-		Cost		Deprec-		Cost	Cost	Fuel
	(HP)	Implement[1]	Acres/hr	Acres/yr	Fuel	Other	Per Acre	Repairs	iation	Overhead[3]	Per Acre[4]	Per Acre[5]	Gal/Acre
Crop Maintenance Equipment													
Row Cultivator 8 Row-30, 20 Ft	130 MFWD	$9,000	10.30	1,030	$1.10	$2.63	$1.41	$0.21	$0.50	$0.50	$ 6.35	$ 4.83	0.44
Row Cultivator 16 Row-30, 40 Ft	200 MFWD	$19,000	20.61	2,061	$1.10	$1.82	$0.71	$0.22	$0.52	$0.49	$ 4.86	$ 3.69	0.44
Cultivator High Residue 6 Row-30, 15 Ft	130 MFWD	$23,000	7.73	773	$1.70	$3.51	$1.88	$0.70	$1.69	$1.49	$ 10.97	$ 8.13	0.69
Cultivator High Residue, Guidance System, Higher Speed 6 Row-30, 15 Ft	130 MFWD	$28,000	11.59	773	$1.22	$2.34	$1.26	$0.35	$2.05	$1.79	$ 9.01	$ 6.32	0.49
Rotary Hoe 21 Ft	105 MFWD	$10,000	25.96	2,596	$0.44	$0.76	$0.56	$0.11	$0.22	$0.22	$ 2.30	$ 1.79	0.18
Potato Cultivator 6 Row, 19 Ft	105 MFWD	$13,000	8.04	1,126	$1.42	$2.44	$1.81	$0.57	$0.65	$0.59	$ 7.49	$ 5.95	0.57
Sugar Beet Cult 12 Row, 22 Ft	105 MFWD	$16,000	5.60	336	$1.99	$3.51	$2.60	$0.36	$2.70	$2.54	$ 13.71	$ 9.81	0.81
Sugar Beet Cult 24 Row, 44 Ft	200 MFWD	$38,000	11.20	672	$1.99	$3.35	$1.30	$0.43	$3.21	$2.86	$ 13.14	$ 9.03	0.81
Boom Sprayer, Self-Prop 60 Ft	None	$95,000	33.09	3,309	$0.26	$0.00	$0.66	$1.38	$1.39	$1.48	$ 5.18	$ 3.69	0.11
Boom Sprayer 50 Ft	60	$21,000	25.61	2,561	$0.26	$0.28	$0.85	$0.39	$0.40	$0.46	$ 2.64	$ 2.06	0.10
Stalk Shredder 20 Ft	130 MFWD	$23,000	7.76	776	$1.82	$3.49	$1.99	$0.99	$1.75	$1.57	$ 11.61	$ 8.70	0.74
Harvesting Equipment													
Mower-Conditioner 9 Ft	40	$20,000	4.36	349	$1.00	$1.35	$3.53	$0.89	$3.30	$2.87	$ 12.95	$ 9.49	0.40
Rotary Hay Mower 6 Ft	40	$4,000	2.91	291	$1.50	$2.03	$4.81	$0.81	$0.72	$0.80	$ 10.67	$ 8.98	0.61
Rotary Mow/Cond 12 Ft	75	$27,000	8.73	698	$1.09	$1.07	$1.68	$0.53	$2.23	$1.90	$ 8.51	$ 6.14	0.44
Hay Rake (Hyd) 9 Ft	40	$7,000	6.11	698	$0.71	$0.97	$2.29	$0.25	$0.58	$0.58	$ 5.38	$ 4.38	0.29
Hay Rake (Wheel, 2-16') 30 Ft	40	$43,000	26.18	2,095	$0.17	$0.23	$0.53	$0.31	$1.19	$1.04	$ 3.46	$ 2.32	0.07
Hay Swather-Cond 14 Ft	60	$28,000	6.79	543	$1.04	$1.04	$2.06	$0.81	$2.97	$2.71	$ 10.63	$ 7.47	0.42
Swather-Cond, Self-Prop 16 Ft	None	$100,000	7.76	621	$0.99	$0.00	$1.80	$0.83	$9.29	$7.82	$ 20.73	$ 12.91	0.40
Grain Swather, Self-Prop 21 Ft	None	$94,000	10.18	815	$0.75	$0.00	$1.38	$0.59	$6.65	$5.68	$ 15.05	$ 9.37	0.30
Hay Baler PTO Twine 12 Ft	40	$22,000	4.36	873	$1.00	$1.35	$4.45	$2.54	$1.46	$1.32	$ 12.12	$ 10.22	0.40
Round Baler 1000 Lb, 20 Ft	75	$21,000	9.45	2,364	$0.86	$0.99	$1.64	$2.05	$0.51	$0.44	$ 6.51	$ 5.63	0.35
Round Baler 1500 Lb, 20 Ft	75	$29,000	9.45	2,364	$0.86	$0.99	$1.64	$2.84	$0.71	$0.61	$ 7.65	$ 6.61	0.35
Rd Baler/Wrap 1500 Lb, 20 Ft	105 MFWD	$35,000	9.45	2,364	$1.21	$2.08	$1.48	$3.42	$0.86	$0.71	$ 9.76	$ 8.25	0.49
Rd Baler/Wrap 1500 Lb, 20 Ft	105 MFWD	$35,000	9.45	2,364	$1.21	$2.08	$1.48	$3.42	$0.86	$0.71	$ 9.76	$ 8.25	0.49
Large Rectangular Baler 3x3 20 Ft	130 MFWD	$87,000	11.64	1,164	$1.22	$2.33	$1.67	$0.55	$6.96	$4.07	$ 16.80	$ 11.83	0.49
Large Rectangular Baler 4x3 20 Ft	130 MFWD	$106,000	11.64	1,164	$1.22	$2.33	$1.67	$0.67	$8.47	$4.93	$ 19.29	$ 13.46	0.49
Forage Harvester (Corn Head) 2 Row, 5 Ft	105 MFWD	$31,400	1.38	276	$8.29	$14.24	$14.09	$6.42	$6.47	$5.70	$ 55.21	$ 44.00	3.35
Forage Harvester (Pickup Head) 12 Ft	105 MFWD	$29,000	3.31	662	$3.46	$5.93	$5.87	$2.47	$2.49	$2.20	$ 22.42	$ 17.92	1.40
Corn Head for SP Harvstr Base 4 Row, 10 Ft	315 HP SP Forage Harvester Base Unit	$49,000	3.39	509	$4.97	$37.25	$5.72	$0.87	$5.47	$4.93	$ 59.20	$ 39.52	2.01
Corn Head for SP Harvstr Base 6 Row, 15 Ft	570 HP SP Forage Harvester Base Unit	$63,900	5.09	611	$4.97	$36.73	$3.82	$0.60	$5.94	$5.25	$ 57.32	$ 37.60	2.01

	Tractor	Net Cost	--Estimated--				Labor	--Implement Cost/Acre--			Total	Use-related	Diesel
	Size	of a New	Work-Performed		-Power Cost/Acre[2]-		Cost		Deprec-		Cost	Cost	Fuel
	(HP)	Implement[1]	Acres/hr	Acres/yr	Fuel	Other	Per Acre	Repairs	iation	Overhead[3]	Per Acre[4]	Per Acre[5]	Gal/Acre
Corn Head for SP Harvstr Base 8 Row, 20 Ft	315 HP SP Forage Harvester Base Unit	$83,800	6.79	1,358	$4.97	$18.62	$2.86	$0.99	$3.51	$3.05	$ 34.01	$ 23.57	2.01
Pickup Head for SP Harvstr Base (2X Windrows) 24 Ft	570 HP SP Forage Harvester Base Unit	$15,900	8.15	652	$4.16	$22.96	$2.38	$0.06	$1.39	$1.46	$ 32.40	$ 21.91	1.68
Combine Grain Head 20 Ft	275 HP Combine	$23,000	6.79	1,358	$3.68	$17.91	$2.86	$0.39	$1.07	$0.80	$ 26.70	$ 20.89	1.49
Combine Grain Head 30 Ft	275 HP Combine	$28,000	10.18	2,036	$3.68	$11.94	$1.91	$0.32	$0.86	$0.65	$ 19.35	$ 15.37	1.49
Combine Soybean Hd 18 Ft	275 HP Combine	$23,000	5.35	1,069	$5.45	$22.74	$3.63	$0.50	$1.35	$1.03	$ 34.71	$ 27.31	2.20
Combine Soybean Hd 25 Ft	275 HP Combine	$27,000	7.42	1,485	$5.45	$16.37	$2.62	$0.42	$1.14	$0.86	$ 26.87	$ 21.43	2.20
Combine Corn Hd 6 Row-30, 15 Ft	275 HP Combine	$49,000	4.20	840	$5.95	$28.94	$4.63	$1.36	$3.67	$2.71	$ 47.25	$ 36.45	2.41
Combine Corn Hd 8 Row-30, 20 Ft	275 HP Combine	$62,000	5.09	1,018	$5.95	$23.87	$3.82	$1.42	$3.83	$2.83	$ 41.72	$ 32.21	2.41
Combine Corn Hd 12 Row-30, 30 Ft	340 HP Combine	$68,000	7.64	1,527	$5.95	$17.75	$2.54	$1.04	$2.80	$2.06	$ 32.15	$ 25.11	2.41
Combine Belt Pickup Hd 23 Ft	275 HP Combine	$20,000	6.69	713	$4.48	$18.17	$2.90	$0.17	$1.70	$1.35	$ 28.77	$ 22.34	1.81
Potato Harvester 2 Row, 6.3 Ft	75	$74,000	1.38	295	$5.03	$6.80	$41.25	$16.52	$14.53	$11.72	$ 95.85	$ 81.14	2.03
Potato Harvester 4 Row, 12.6 Ft	105 MFWD	$147,000	2.76	590	$5.03	$7.12	$20.62	$16.41	$14.43	$11.64	$ 75.25	$ 60.86	2.03
Bean Cutter 6 Row-30, 15 Ft	130 MFWD	$14,000	8.73	698	$1.62	$3.10	$2.23	$0.35	$1.18	$1.02	$ 9.50	$ 7.29	0.66
Bean Cutter 6 Row-30, 15 Ft	130 MFWD	$14,000	8.73	698	$1.62	$3.10	$2.23	$0.35	$1.18	$1.02	$ 9.50	$ 7.29	0.66
Bean Rod 6 Row-30, 15 Ft	130 MFWD	$7,000	8.73	698	$1.62	$3.10	$2.23	$0.17	$0.59	$0.55	$ 8.27	$ 6.52	0.66
Bean Windrower 6 Row-30, 15 Ft	130 MFWD	$34,000	8.73	698	$1.62	$3.10	$2.23	$0.84	$2.87	$2.34	$ 13.01	$ 9.47	0.66
Sugar Beet Lifter 6 Row, 11 Ft	160 MFWD	$82,000	3.03	243	$5.54	$9.76	$6.40	$17.51	$19.93	$16.02	$ 75.16	$ 55.48	2.24
Sugar Beet Lifter 8 Row, 14.7 Ft[6]	200 MFWD	$96,000	4.05	324	$5.54	$9.25	$4.79	$15.34	$17.46	$13.99	$ 66.37	$ 48.92	2.24
Sugar Beet Lifter (Higher Usage) 8 Row, 14.7 Ft[6]	200 MFWD	$96,000	4.05	1,013	$5.54	$9.25	$4.79	$14.24	$14.62	$5.58	$ 54.02	$ 44.98	2.24
Sugar Beet Topper 8 Row, 14.7 Ft	75	$41,000	7.13	570	$1.44	$1.32	$2.46	$1.76	$4.24	$3.49	$ 14.70	$ 10.63	0.58
Sugar Beet Topper 12 Row, 22 Ft	160 MFWD	$48,000	10.67	853	$1.44	$2.77	$1.64	$1.38	$3.32	$2.79	$ 13.34	$ 9.51	0.58
Sugar Beet Wagon 20 Ton, 11 Ft	200 MFWD	$56,000	5.20	520	$4.45	$7.21	$2.69	$2.40	$6.24	$5.35	$ 28.34	$ 20.30	1.80
Sugar Beet Wagon 24 Ton, 11 Ft	225 MFWD	$64,000	5.20	520	$4.45	$9.74	$2.69	$2.74	$7.13	$6.07	$ 32.82	$ 22.89	1.80
Bale Mover, Round Bales 1 Hr	130 MFWD	$22,000	6.76	1,690	$2.09	$4.01	$2.07	$1.05	$0.75	$0.61	$ 10.59	$ 8.44	0.85
Bale Mover, Square Bales 1 Hr	130 MFWD	$33,000	6.08	1,520	$2.33	$4.46	$2.30	$1.76	$1.26	$1.01	$ 13.11	$ 10.38	0.94
Telescoping Bale Handler 1 Hr	None	$80,000	4.60	2,300	$2.69	$0.00	$3.04	$0.58	$2.12	$1.58	$ 10.02	$ 8.44	1.09

[1]Net cost of a new unit assumes no trade-in. Farm machinery is exempt from sales tax in Minnesota so no sales tax is included.

[2]Power cost per acre for the power unit assigned to each implement multiplied times that implement's acres/hour equals that power unit's total cost per hour shown in the "Tractors and Combines (Without Heads)" table above.

[3]Overhead per acre will vary with annual use.

[4]Total cost/acre is total cost per hour divided by acres per hour. Includes fuel, lubricants, power and equipment repairs and maintenance, labor, and overhead costs including depreciation. Fuel is included in power cost.

[5]Use-related cost/acre is included in the total cost/acre amount. Use-related cost/acre includes everything in total cost/acre EXCEPT that non-depreciation overhead costs (interest, insurance, and housing) are omitted. Depreciation is included in use-related cost under the assumption that extra use reduces trade-in value which increases annual depreciation. In other words, depreciation is considered here to be at least partially use-related even though it is commonly thought of as being mainly time-related.

[6]Cost data for the 8 row sugar beet lifter is calculated for two levels of annual usage, 80 and 250 hours. The 250 hours/year is intended to reflect a custom work situation. At the higher usage, the machine is traded after 3 years with a trade-in value of 32% of list price. At the lower 80-hour usage level, it is traded at 12 years with a trade-in value 26% of list.