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1980 CUSTOM RATES

(FROM MINNESOTA FARM MACHINERY
ECONOMIC COST ESTIMATES FOR 1980)

by

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The information in this bulletin is recommended for use in estimating machinery ownership costs, field efficiency (acres/hour) and suggested custom rates for 1980. These machinery costs are average estimates for the agricultural industry.

There are two types of costs associated with owning and operating a machine. Fixed costs--which will occur whether or not the machine is used--include depreciation, interest, insurance, housing and taxes. Operating costs--which occur only when the machine is used--include fuel, lubrication, repairs and labor.

Fixed costs: Each machine is depreciated for 10 years with a salvage value of 10 percent and investment credit taken at the full 10 percent rate. It is assumed that a piece of equipment once purchased new will be used commercially for 10 years even though it may be owned by several people.

Interest and insurance are calculated by multiplying the average investment (new cost plus salvage value divided by 2) times the rates of interest and insurance. Interest and insurance rates are assumed to be 14 percent and .75 percent, respectively. Housing cost is assumed to be 33¢ per square foot of shelter space needed per year. There are no property taxes on farm machinery in Minnesota.

Formulas used to compute fixed machinery costs:

$$\text{Depreciation per year} = \frac{\text{purchase price} - \text{investment credit} - \text{salvage value}}{(\text{years you will use machine})}$$

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

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

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

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

Operating costs: Fuel cost is calculated by multiplying the fuel consumption by the price of fuel. The price of fuel is assumed to be \$1.25 per gallon for diesel. All power units, tractors, combines, trucks, etc., are assumed to be diesel powered. An estimate of gasoline consumption might be made by multiplying the diesel fuel consumption by a factor of 1.36. Lubrication cost is assumed to be 10 percent of fuel cost.

The formulas for estimating the repair and maintenance costs necessary to maintain a machine in an operable condition are provided in the 1976 Agricultural Engineer's Yearbook and illustrated in the MACHINE User's Guide. The formulas can be used to estimate total accumulated repair costs according to the

accumulated hours of use. For a new machine, the estimate is merely one of estimating repair costs for the number of hours of intended use of the machine. The estimate is the total repair cost. This cost is divided by the total hours of use in order to provide an average repair cost per hour. An assumption is made as to the annual use of each machine. The amount of annual use is an estimate of annual hours of use that a commercial farmer would use that particular machine in one year.

Labor is assumed to be an hourly wage rate which includes benefits of \$5.20 per hour for unskilled labor and \$7 per hour for skilled labor. Labor for an operation such as plowing and discing is calculated by using the rate on the implement instead of the tractor. Plows and discs using the same tractor have different rates of work accomplishment. Less labor is charged on a discing operation which covers more acres per hour than a plowing operation.

This year, four different sizes of minimum tillage planters have been included. This reflects the current interest in minimum or reduced tillage practices in Minnesota.

Table 1 provides estimates of purchase price, annual hours and acres of use, and the estimated number of acres which can be worked per hour. The new cost estimates are based on a survey of farm machinery manufacturers which was taken in December 1979.

Table 2 provides estimates of total fuel consumption per acre by implements which are used in conjunction with the specified tractor.

Table 3 shows cash operating costs (which include fuel, oil and repairs), total costs (include the cash operating costs plus ownership costs and labor), and suggested custom rates (which may involve the machine over more acres which reduces per unit ownership costs, but also includes a 20 percent add on to cover risk and provide a profit). Annual machine ownership and operating costs are important figures for the owner-operator to use in determining an appropriate custom rate and to maintain proper machinery management. Charges made for custom work must be a function of the owner's costs, but local "going" rates must be considered in order to remain competitive in a particular area.

Some pieces of equipment are assumed to be used over more acres when used by a custom operator so that the annual overhead may be spread over more hours or acres than would be the case for the average farm operator. This indicates somewhat lower costs because of reduced per unit overhead as compared to the commercial operator. The cash operating costs (out of pocket costs) include fuel, oil, repairs and maintenance for each set of equipment. Labor is not included in the cash operating costs but is included in the total function costs and suggested custom rates. The labor wage rate for unskilled labor is \$5.20 per hour and a charge of \$7 per hour is used for skilled labor.

These cost estimates are not intended to be indicative of everyone's cost, but are intended to be used as a guide in planning the cropping operation. Each individual has unique costs because of buying power, repair program, average annual use and overall replacement program.

For more detail of farm machinery cost estimates, refer to FM 609, Minnesota Farm Machinery Economic Cost Estimates for 1980.

TABLE 1

ESTIMATED PRICES, ANNUAL USE, AND MACHINE TIME FOR SELECTED ITEMS OF MACHINERY

MACHINE	NEW COST	AVERAGE INVESTMENT	ANNUAL HOURS USE	ANNUAL ACRES USE	ESTIMATED ACRES/HR
PLOW 2-16	1130.00	621.50	120.00	139.29	1.16
PLOW 3-16	2170.00	1193.50	120.00	209.45	1.75
PLOW 4-16	3400.00	1870.00	120.00	279.10	2.33
PLOW 5-16	5290.00	2909.50	120.00	348.74	2.91
PLOW 6-16	6210.00	3415.50	130.00	453.82	3.49
PLOW 7-16	7980.00	4389.00	130.00	529.27	4.07
PLOW 8-16	8650.00	4757.50	130.00	604.71	4.65
PLOW 9-18	13440.00	7392.00	150.00	883.64	5.89
PLOW 10-18	13850.00	7617.50	150.00	981.82	6.55
PLOW 12-18	15370.00	8453.50	150.00	1178.18	7.85
CHISEL PLOW 15 FT	2960.00	1628.00	100.00	654.55	6.55
CHISEL PLOW 17 FT	4700.00	2585.00	100.00	741.82	7.42
CHISEL PLOW 20 FT	6140.00	3377.00	100.00	872.73	8.73
CHISEL PLOW WING 24	6780.00	3729.00	100.00	1047.27	10.47
CHISEL PLOW WING 29	8170.00	4493.50	100.00	1265.45	12.65
CHISEL PLOW WING 35	8330.00	4581.50	100.00	1527.27	15.27
FIELD CULTIVATOR 18	2880.00	1584.00	120.00	1047.27	8.73
FIELD CULTIVATOR 28	5740.00	3157.00	120.00	1629.09	13.58
FIELD CULTIVATOR 37	7600.00	4180.00	120.00	2152.73	17.94
MIN-TIL PLANTER 4-38	7790.00	4284.50	60.00	225.58	3.76
MIN-TIL PLANTER 6-38	12160.00	6688.00	60.00	338.55	5.64
MIN-TIL PLANTER 6-30	11200.00	6160.00	60.00	267.27	4.45
MIN-TIL PLANTER 8-30	14030.00	7716.50	60.00	356.36	5.94
DISK 10 FT	2350.00	1292.50	100.00	484.85	4.85
DISK 16 FT	5140.00	2827.00	100.00	775.76	7.76
DISK 17 FT	6320.00	3476.00	100.00	824.24	8.24
DISK 20 FT	6400.00	3520.00	100.00	969.70	9.70
DISK 21 FT	7120.00	3916.00	100.00	1018.18	10.18
DISK 24 FT	9680.00	5324.00	100.00	1163.64	11.64

TABLE 1, CONTINUED

ESTIMATED PRICES, ANNUAL USE, AND MACHINE TIME FOR SELECTED ITEMS OF MACHINERY

MACHINE	NEW COST	AVERAGE INVESTMENT	ANNUAL HOURS USE	ANNUAL ACRES USE	ESTIMATED ACRES/HR
DISK 28 FT	11270.00	6198.50	100.00	1357.58	13.58
DISK 32 FT	12350.00	6792.50	100.00	1551.52	15.52
DISK OFFSET 14 FT	5760.00	3168.00	100.00	610.91	6.11
DISK OFFSET 16 FT	6990.00	3844.50	100.00	698.18	6.98
DISK OFFSET 18 FT	7680.00	4224.00	100.00	785.45	7.85
DISK-WING OFFSET 21	9110.00	5010.50	100.00	916.36	9.16
DISK-WING OFFSET 23	11400.00	6270.00	100.00	1003.64	10.04
LANDPLANE 45-12FT	5970.00	3283.50	75.00	480.00	6.40
LANDPLANE 54-12FT	9800.00	5390.00	75.00	480.00	6.40
LANDPLANE 54-15FT	10120.00	5566.00	75.00	600.00	8.00
LANDPLANE 75-14FT	10750.00	5912.50	75.00	560.00	7.47
SPRINGTOOTH DRAG 30	2940.00	1617.00	30.00	480.00	16.00
SPRINGTOOTH DRAG 48	5300.00	2915.00	35.00	1058.91	30.25
FERTILIZER SPRDR 40	3700.00	2035.00	30.00	1163.64	38.79
CORN PLANTER 4-38	5730.00	3151.50	60.00	290.03	4.83
CORN PLANTER 6-38	8760.00	4818.00	60.00	435.27	7.25
CORN PLANTER 6-30	8150.00	4482.50	60.00	343.64	5.73
CORN PLANTER 8-30	10300.00	5665.00	60.00	458.18	7.64
POTATO PLANTER 4 ROW	13500.00	7425.00	65.00	248.97	3.83
BEEF PLANTER 12ROW	12640.00	6952.00	60.00	280.00	4.67
GRAIN DRILL PW 14 FT	7800.00	4290.00	80.00	445.96	5.57
GRAIN DRILL PW 16 FT	10680.00	5874.00	80.00	509.67	6.37
GRAIN DRILL PW 20 FT	12550.00	6902.50	80.00	637.09	7.96
GRAIN DRILL PW 24 FT	14260.00	7843.00	80.00	764.51	9.56
GRAIN DRILL PW 28 FT	16000.00	8800.00	80.00	891.93	11.15
CULTIVATOR 4-38	1910.00	1050.50	100.00	491.05	4.91
CULTIVATOR 6-38	2910.00	1600.50	100.00	736.97	7.37
CULTIVATOR 6-30	2170.00	1193.50	100.00	581.82	5.82
CULTIVATOR 8-30	3040.00	1672.00	100.00	775.76	7.76

TABLE 1, CONTINUED

ESTIMATED PRICES, ANNUAL USE, AND MACHINE TIME FOR SELECTED ITEMS OF MACHINERY

MACHINE	NEW COST	AVERAGE INVESTMENT	ANNUAL HOURS USE	ANNUAL ACRES USE	ESTIMATED ACRES/HR
ROTARY HOE 16	2400.00	1320.00	40.00	434.42	10.86
POTATO CULT. 4 ROW	3350.00	1842.50	130.00	796.70	6.13
BEEF CULT. 12 ROW	5050.00	2777.50	60.00	360.00	6.00
BEEF THINNER 6 ROW	12110.00	6660.50	100.00	210.00	2.10
BEEF THINNER 12 ROW	23230.00	12776.50	100.00	420.00	4.20
SPRAYER 30FT	2100.00	1155.00	80.00	1134.55	14.18
SPRAYER 50FT	3470.00	1908.50	100.00	2363.64	23.64
SPRAYER HI PRES 50FT	10850.00	5967.50	100.00	2363.64	23.64
ANHYDROUS APPLICATOR	3870.00	2128.50	40.00	356.36	8.91
SHREDDER 12FT	4110.00	2260.50	100.00	436.36	4.36
SWATHER-COND. 12FT	15990.00	8794.50	80.00	436.36	5.45
SWATHER-COND. 15FT	16050.00	8827.50	80.00	545.45	6.82
SWATHER 12 FT	14640.00	8052.00	80.00	465.45	5.82
SWATHER 15 FT	14700.00	8085.00	80.00	581.82	7.27
SWATHER 18 FT	14970.00	8233.50	80.00	698.18	8.73
SWATHER 20 FT	16660.00	9163.00	80.00	775.76	9.70
1. TON STACKER	8490.00	4669.50	200.00	829.09	4.15
3 TON STACKER	13260.00	7293.00	220.00	1064.00	4.84
6 TON STACKER	18340.00	10087.00	280.00	1547.64	5.53
BALER PTO TWINE	6650.00	3657.50	200.00	756.36	3.78
ROUND BALER	8640.00	4752.00	200.00	927.27	4.64
ROTARY MOWER	1670.00	918.50	100.00	272.73	2.73
RAKE (HYD)	1910.00	1050.50	200.00	698.18	3.49
FORAGE HARV. 1 ROW	9420.00	5181.00	100.00	94.55	.95
FORAGE HARV. 2 ROW	11070.00	6088.50	100.00	165.45	1.65
FOR HARV 2ROW SP	49770.00	27373.50	150.00	305.45	2.04
FOR HAR 3ROW SP	51390.00	28264.50	150.00	458.18	3.05
FORAGE BLOWER LG	2030.00	1116.50	50.00		

TABLE 1, CONTINUED

ESTIMATED PRICES, ANNUAL USE, AND MACHINE TIME FOR SELECTED ITEMS OF MACHINERY

MACHINE	NEW COST	AVERAGE INVESTMENT	ANNUAL HOURS USE	ANNUAL ACRES USE	ESTIMATED ACRES/HR
CORN PICKER 2-38	10200.00	5610.00	150.00	223.36	1.49
PICKER-SHELLER 2-ROW	11560.00	6358.00	150.00	223.36	1.49
COMBINE SM GRAIN SML	3890.00	2139.50	200.00	819.39	4.10
COMBINE SM GRAIN MED	4310.00	2370.50	200.00	945.45	4.73
COMBINE SM GRAIN LGE	4990.00	2744.50	200.00	1260.61	6.30
COMBINE SOYBEANS SML	5160.00	2838.00	200.00	716.97	3.58
COMBINE SOYBEANS MED	5880.00	3234.00	200.00	827.27	4.14
COMBINE SOYBEANS LGE	7530.00	4141.50	200.00	992.73	4.96
COMBINE CORN 2-38 SM	4210.00	2315.50	200.00	297.82	1.49
COMBINE CORN 3-38 SM	6820.00	3751.00	200.00	449.09	2.25
COMBINE CORN 4-38 MD	9180.00	5049.00	200.00	598.47	2.99
COMBINE CORN 4-30 MD	8760.00	4818.00	200.00	520.00	2.60
COMBINE CORN 6-30 LG	12000.00	6600.00	200.00	780.00	3.90
COMBINE CORN 8-30 LG	15730.00	8651.50	200.00	945.45	4.73
POTATO HRVSTR. 2ROW	22000.00	12100.00	120.00	298.76	2.49
BEET LIFTER 3 ROW	14700.00	8085.00	80.00	208.00	2.60
BEET LIFTER 4 ROW	18000.00	9900.00	80.00	277.21	3.47
BEET LIFTER 6 ROW	27100.00	14905.00	80.00	416.00	5.20
BEET TOPPER 3 ROW	6900.00	3795.00	80.00	256.00	3.20
BEET TOPPER 4 ROW	8740.00	4807.00	80.00	341.18	4.26
BEET TOPPER 6 ROW	9400.00	5170.00	80.00	512.00	6.40
BEET WAGON 8TON	6100.00	3355.00	80.00		
LIGHT TRUCK	9350.00	5142.50	400.00		
MEDIUM TRUCK	15500.00	8525.00	400.00		
HEAVY TRUCK	24450.00	13447.50	400.00		
WAGON	1980.00	1089.00	250.00		
FORAGE WAGON 14FT	5100.00	2805.00	130.00		
FORAGE WAGON 16FT	5460.00	3003.00	130.00		

TABLE 2

ESTIMATED FUEL USE PER ACRE FOR SPECIFIED ITEMS OF MACHINERY

MACHINE	TRACTOR HP	TRACTOR FUEL CONS.	MACHINE FUEL CONS.	TOTAL FUEL CONS.
PLOW 2-16	40	2.07	0	2.07
PLOW 3-16	60	2.06	0	2.06
PLOW 4-16	75	1.93	0	1.93
PLOW 5-16	100	2.06	0	2.06
PLOW 6-16	120	2.06	0	2.06
PLOW 7-16	140	2.06	0	2.06
PLOW 8-16	160	2.06	0	2.06
PLOW 9-18	225	2.29	0	2.29
PLOW 10-18	225	2.06	0	2.06
PLOW 12-18	275	2.10	0	2.10
CHISEL PLOW 15 FT	120	1.10	0	1.10
CHISEL PLOW 17 FT	140	1.13	0	1.13
CHISEL PLOW 20 FT	160	1.10	0	1.10
CHISEL PLOW WING 24	225	1.29	0	1.29
CHISEL PLOW WING 29	250	1.19	0	1.19
CHISEL PLOW WING 35	300	1.18	0	1.18
FIELD CULTIVATOR 18	100	.69	0	.69
FIELD CULTIVATOR 28	160	.71	0	.71
FIELD CULTIVATOR 37	225	.75	0	.75
MIN-TIL PLANTER 4-38	40	.64	0	.64
MIN-TIL PLANTER 6-38	60	.64	0	.64
MIN-TIL PLANTER 6-30	60	.81	0	.81
MIN-TIL PLANTER 8-30	75	.76	0	.76
DISK 10 FT	60	.74	0	.74
DISK 16 FT	75	.58	0	.58
DISK 17 FT	75	.55	0	.55

TABLE 2, CONTINUED

ESTIMATED FUEL USE PER ACRE FOR SPECIFIED ITEMS OF MACHINERY

MACHINE	TRACTOR HP	TRACTOR FUEL CONS.	MACHINE FUEL CONS.	TOTAL FUEL CONS.
DISK 20 FT	100	.62	0	.62
DISK 21 FT	100	.59	0	.59
DISK 24 FT	120	.62	0	.62
DISK 28 FT	140	.62	0	.62
DISK 32 FT	160	.62	0	.62
DISK OFFSET 14 FT	140	1.38	0	1.38
DISK OFFSET 16 FT	160	1.38	0	1.38
DISK OFFSET 18 FT	180	1.38	0	1.38
DISK-WING OFFSET 21	225	1.47	0	1.47
DISK-WING OFFSET 23	225	1.35	0	1.35
LANDPLANE 45-12FT	180	1.69	0	1.69
LANDPLANE 54-12FT	225	2.11	0	2.11
LANDPLANE 54-15FT	225	1.69	0	1.69
LANDPLANE 75-14FT	225	1.81	0	1.81
SPRINGTOOTH DRAG 30	60	.22	0	.22
SPRINGTOOTH DRAG 48	75	.15	0	.15
FERTILIZER SPRDR 40	60	.09	0	.09
CORN PLANTER 4-38	40	.50	0	.50
CORN PLANTER 6-38	60	.50	0	.50
CORN PLANTER 6-30	60	.63	0	.63
CORN PLANTER 8-30	75	.59	0	.59
POTATO PLANTER 4 ROW	120	1.88	0	1.88
BEET PLANTER 12ROW	100	1.29	0	1.29
GRAIN DRILL PW 14 FT	40	.43	0	.43
GRAIN DRILL PW 16 FT	60	.57	0	.57
GRAIN DRILL PW 20 FT	75	.57	0	.57

TABLE 2, CONTINUED

ESTIMATED FUEL USE PER ACRE FOR SPECIFIED ITEMS OF MACHINERY

MACHINE	TRACTOR HP	TRACTOR FUEL CONS.	MACHINE FUEL CONS.	TOTAL FUEL CONS.
GRAIN DRILL PW 24 FT	75	.47	0	.47
GRAIN DRILL PW 28 FT	100	.54	0	.54
CULTIVATOR 4-38	40	.49	0	.49
CULTIVATOR 6-38	60	.49	0	.49
CULTIVATOR 6-30	60	.62	0	.62
CULTIVATOR 8-30	75	.58	0	.58
ROTARY HOE 16	40	.22	0	.22
POTATO CULT. 4 ROW	75	.73	0	.73
BEET CULT. 12 ROW	100	1.00	0	1.00
BEET THINNER 6 ROW	100	2.86	0	2.86
BEET THINNER 12 ROW	120	1.71	0	1.71
SPRAYER 30FT	40	.17	0	.17
SPRAYER 50FT	60	.15	0	.15
SPRAYER HI PRES 50FT	60	.15	0	.15
ANHYDROUS APPLICATOR	120	.81	0	.81
SHREDDER 12FT	60	.83	0	.83
SWATHER-COND. 12FT	---	0	.55	.55
SWATHER-COND. 15FT	---	0	.44	.44
SWATHER 12 FT	---	0	.52	.52
SWATHER 15 FT	---	0	.41	.41
SWATHER 18 FT	---	0	.34	.34
SWATHER 20 FT	---	0	.31	.31
1 TON STACKER	60	.87	0	.87
3 TON STACKER	75	.93	0	.93
6 TON STACKER	100	1.09	0	1.09
BALER PTO TWINE	40	.63	0	.63

Table 2, Continued

ESTIMATED FUEL USE PER ACRE FOR SPECIFIED ITEMS OF MACHINERY

MACHINE	TRACTOR HP	TRACTOR FUEL CONS.	MACHINE FUEL CONS.	TOTAL FUEL CONS.
ROUND BALER	60	.78	0	.78
ROTARY MOWER	40	.88	0	.88
RAKE (HYD)	40	.69	0	.69
FORAGE HARV. 1 ROW	60	3.81	0	3.81
FORAGE HARV. 2 ROW	100	3.63	0	3.63
FOR HARV 2ROW SP	---	0	3.63	3.63
FOR HAR 3ROW SP	---	0	2.78	2.78
FORAGE BLOWER LG	60			
CORN PICKER 2-38	40	1.61	0	1.61
PICKER-SHELLER 2-ROW	60	2.42	0	2.42
COMBINE SM GRAIN SML	SML	1.46	0	1.46
COMBINE SM GRAIN MED	MED	1.40	0	1.40
COMBINE SM GRAIN LGE	LRG	1.22	0	1.22
COMBINE SOYBEANS SML	SML	1.67	0	1.67
COMBINE SOYBEANS MED	MED	1.60	0	1.60
COMBINE SOYBEANS LGE	LRG	1.55	0	1.55
COMBINE CORN 2-38 SM	SML	4.03	0	4.03
COMBINE CORN 3-38 SM	SML	2.67	0	2.67
COMBINE CORN 4-38 MD	MED	2.21	0	2.21
COMBINE CORN 4-30 MD	MED	2.54	0	2.54
COMBINE CORN 6-30 LG	LRG	1.97	0	1.97
COMBINE CORN 8-30 LG	LRG	1.62	0	1.62
POTATO HRVSTR. 2ROW	120	2.89	0	2.89
BEET LIFTER 3 ROW	100	2.31	0	2.31
BEET LIFTER 4 ROW	100	1.73	0	1.73
BEET LIFTER 6 ROW	120	1.38	0	1.38
BEET TOPPER 3 ROW	60	1.13	0	1.13
BEET TOPPER 4 ROW	75	1.06	0	1.06
BEET TOPPER 6 ROW	100	.94	0	.94
BEET WAGON 8TON	75	1.30	0	1.30
LIGHT TRUCK	---	0	2.64	2.64
MEDIUM TRUCK	---	0	3.96	3.96
HEAVY TRUCK	---	0	6.60	6.60
WAGON	40	.63	0	.63
FORAGE WAGON 14FT	40	1.45	0	1.45
FORAGE WAGON 16FT	40	1.45	0	1.45

TABLE 3

ESTIMATED OPERATING COSTS, OWNERSHIP COSTS AND SUGGESTED CUSTOM RATES
ON A PER HOUR AND A PER ACRE BASIS

MACHINE	TRACTOR HP	CASH OPERATING COSTS		TOTAL COSTS		SUGGESTED CUSTOM RATES	
		PER HOUR	PER ACRE	PER HOUR	PER ACRE	PER HOUR	PER ACRE
PLOW 2-16	40	4.42	3.81	14.81	12.76	17.64	15.20
PLOW 3-16	60	6.71	3.87	20.03	11.48	23.78	13.63
PLOW 4-16	75	8.70	3.74	24.88	10.70	29.46	12.67
PLOW 5-16	100	12.13	4.17	32.89	11.32	38.85	13.37
PLOW 6-16	120	14.65	4.20	38.01	10.89	44.72	12.81
PLOW 7-16	140	17.18	4.22	43.63	10.72	51.38	12.62
PLOW 8-16	160	19.44	4.18	46.69	10.04	55.10	11.85
PLOW 9-18	225	27.11	4.60	65.44	11.11	76.87	13.05
PLOW 10-18	225	27.28	4.17	66.07	10.09	78.10	11.93
PLOW 12-18	275	32.56	4.15	76.29	9.71	91.18	11.61
CHISEL PLOW 15 FT	120	13.23	2.03	34.12	5.21	40.52	6.19
CHISEL PLOW 17 FT	140	15.75	2.12	40.36	5.44	47.70	6.43
CHISEL PLOW 20 FT	160	18.26	2.09	45.30	5.19	53.30	6.11
CHISEL PLOW WING 24	225	24.05	2.30	59.15	5.65	70.31	6.71
CHISEL PLOW WING 29	250	27.17	2.15	67.84	5.36	80.37	6.35
CHISEL PLOW WING 35	300	31.64	2.07	74.28	4.86	88.37	5.79
FIELD CULTIVATOR 18	100	11.20	1.28	28.99	3.32	34.77	3.98
FIELD CULTIVATOR 28	160	18.24	1.34	42.65	3.14	51.17	3.77
FIELD CULTIVATOR 37	225	24.50	1.37	58.80	3.28	70.58	3.93
MIN-TIL PLANTER 4-38	40	8.92	2.37	42.28	11.24	48.18	12.82
MIN-TIL PLANTER 6-38	60	13.63	2.41	60.31	10.69	71.04	12.59
MIN-TIL PLANTER 6-30	60	13.02	2.92	57.06	12.81	64.42	14.46
MIN-TIL PLANTER 8-30	75	16.28	2.74	69.29	11.67	78.07	13.14
DISK 10 FT	60	6.78	1.40	21.16	4.36	25.39	5.24
DISK 16 FT	75	9.27	1.19	29.57	3.81	35.49	4.58
DISK 17 FT	75	9.70	1.18	31.78	3.86	38.13	4.63

TABLE 3, CONTINUED

ESTIMATED OPERATING COSTS, OWNERSHIP COSTS AND SUGGESTED CUSTOM RATES
ON A PER HOUR AND A PER ACRE BASIS

MACHINE	TRACTOR HP	CASH OPERATING COSTS		TOTAL COSTS		SUGGESTED CUSTOM RATES	
		PER HOUR	PER ACRE	PER HOUR	PER ACRE	PER HOUR	PER ACRE
DISK 20 FT	100	12.43	1.28	36.87	3.80	44.24	4.56
DISK 21 FT	100	12.64	1.25	38.19	3.75	45.80	4.50
DISK 24 FT	120	15.72	1.35	47.32	4.07	56.67	4.87
DISK 28 FT	140	18.14	1.34	53.19	3.92	63.79	4.70
DISK 32 FT	160	20.53	1.32	57.27	3.69	68.59	4.42
DISK OFFSET 14 FT	140	16.14	2.64	42.31	6.93	50.79	8.31
DISK OFFSET 16 FT	160	18.57	2.66	46.78	6.70	56.10	8.04
DISK OFFSET 18 FT	180	21.51	2.74	54.85	6.98	65.73	8.37
DISK-WING OFFSET 21	225	24.90	2.72	63.85	6.97	76.55	8.35
DISK-WING OFFSET 23	225	25.73	2.56	68.37	6.81	81.90	8.16
LANDPLANE 45-12 FT	180	19.60	3.06	55.19	8.62	66.23	10.35
LANDPLANE 54-12 FT	225	23.05	3.60	70.82	11.07	84.98	13.28
LANDPLANE 54-15 FT	225	23.10	2.89	72.26	9.03	86.71	10.84
LANDPLANE 75-14 FT	225	23.19	3.11	74.46	9.97	89.35	11.97
SPRINGTOOTH DRAG 30	60	6.67	.42	33.54	2.10	40.25	2.52
SPRINGTOOTH DRAG 48	75	8.80	.29	46.62	1.54	55.91	1.85
FERTILIZER SPRJR 40	60	6.86	.18	39.44	1.02	112.98	2.91
CORN PLANTER 4-38	40	7.62	1.58	35.44	7.33	42.53	8.80
CORN PLANTER 6-38	60	11.47	1.58	49.02	6.76	58.51	8.07
CORN PLANTER 6-30	60	11.04	1.94	46.94	8.20	55.83	9.75
CORN PLANTER 8-30	75	13.92	1.82	56.91	7.45	68.15	8.92
POTATO PLANTER 4 ROW	120	21.03	5.49	79.93	20.87	95.75	25.00
BEET PLANTER 12 ROW	100	18.10	3.88	69.62	14.92	83.54	17.90
GRAIN DRILL PW 14 FT	40	9.53	1.71	37.04	6.64	44.27	7.94
GRAIN DRILL PW 16 FT	60	13.51	2.12	48.33	7.59	57.98	9.10
GRAIN DRILL PW 20 FT	75	16.32	2.05	56.23	7.06	67.34	8.46

TABLE 3, CONTINUED

ESTIMATED OPERATING COSTS, OWNERSHIP COSTS AND SUGGESTED CUSTOM RATES
ON A PER HOUR AND A PER ACRE BASIS

MACHINE	TRACTOR HP	CASH OPERATING COSTS		TOTAL COSTS		SUGGESTED CUSTOM RATES	
		PER HOUR	PER ACRE	PER HOUR	PER ACRE	PER HOUR	PER ACRE
GRAIN DRILL PW 24 FT	75	17.53	1.83	19.04	6.39	72.99	7.64
GRAIN DRILL PW 28 FT	100	21.47	1.93	23.60	6.33	84.36	7.57
CULTIVATOR 4-30	40	4.68	.95	16.94	3.45	20.25	4.12
CULTIVATOR 6-30	60	6.98	.95	22.40	3.04	26.86	3.64
CULTIVATOR 6-30	60	6.71	1.15	20.86	3.59	24.97	4.29
CULTIVATOR 8-30	75	8.50	1.10	25.38	3.27	30.42	3.92
ROTARY HOE 16	40	4.65	.43	24.08	2.22	28.73	2.65
POTATO CULT. 4 ROW	75	8.71	1.42	24.45	3.99	29.32	4.78
BEEF CULT. 12 ROW	100	11.67	1.95	39.53	6.59	47.44	7.91
BEEF THINNER 6 ROW	100	14.51	6.91	49.86	23.74	59.83	28.49
BEEF THINNER 12 ROW	120	20.66	4.92	75.89	18.07	91.07	21.68
SPRAYER 30FT	40	5.48	.39	22.57	1.59	27.05	1.91
SPRAYER 50FT	60	8.62	.36	28.53	1.21	34.22	1.45
SPRAYER HI PRES 50FT	60	14.35	.61	46.16	1.95	55.33	2.34
ANHYDROUS APPLICATOR	120	14.70	1.65	48.44	5.44	55.92	6.28
SHREDDER 12FT	60	6.86	1.57	23.90	5.48	28.61	6.56
SWATHER-COND. 12FT	---	8.19	1.50	46.44	8.51	55.40	10.16
SWATHER-COND. 15FT	---	8.21	1.20	46.81	6.86	55.84	8.19
SWATHER 12 FT	---	7.85	1.35	43.38	7.46	51.71	8.89
SWATHER 15 FT	---	7.86	1.08	43.74	6.01	51.98	7.15
SWATHER 18 FT	---	7.93	.91	44.56	5.11	53.38	6.12
SWATHER 20 FT	---	8.30	.86	48.54	5.01	58.02	5.98
1 TON STACKER	60	9.32	2.25	29.10	7.02	34.17	8.24
3 TON STACKER	75	12.91	2.67	36.81	7.61	43.08	8.91
6 TON STACKER	100	18.50	3.35	45.25	8.19	53.12	9.61
BALER PTO TWINE	40	5.94	1.57	22.86	6.04	25.93	6.86



Table 3, Continued

ESTIMATED OPERATING COSTS, OWNERSHIP COSTS AND SUGGESTED CUSTOM RATES
ON A PER HOUR AND A PER ACRE BASIS

MACHINE	TRACTOR HP	CASH		TOTAL COSTS		SUGGESTED CUSTOM RATES	
		OPERATING PER HOUR	COSTS PER ACRE	PER HOUR	PER ACRE	PER HOUR	PER ACRE
ROUND BALE	60	8.45	1.82	26.29	5.67	30.77	6.64
ROTARY MOWER	40	4.80	1.76	16.37	6.00	19.55	7.17
RAKE (HYD)	40	4.69	1.34	15.11	4.33	20.19	5.78
FORAGE HARV. 1 ROW	60	8.76	9.29	36.99	39.12	43.37	45.87
FORAGE HARV. 2 ROW	100	13.46	8.13	47.59	28.76	55.33	33.44
FOR HARV 2ROW SP	---	23.61	11.59	55.35	41.91	97.60	47.93
FOR HAR 3ROW SP	---	25.56	8.37	69.19	29.20	101.42	33.20
FORAGE BLOWER LG	60	6.39		23.24		21.15	
CORN PICKER 2-38	40	7.63	5.12	30.15	20.25	37.76	25.36
PICKER-SHELLER 2-ROW	60	10.05	6.75	35.46	23.81	44.34	29.77
COMBINE SM GRAIN SML	SML	21.97	5.36	52.22	12.75	61.68	15.05
COMBINE SM GRAIN MED	MED	28.95	6.12	68.76	14.54	81.48	17.24
COMBINE SM GRAIN LGE	LRG	33.55	5.32	78.43	12.44	93.69	14.86
COMBINE SOYBEANS SML	SML	22.36	6.24	53.66	14.97	63.05	17.59
COMBINE SOYBEANS MED	MED	29.42	7.11	70.50	17.04	83.19	20.11
COMBINE SOYBEANS LGE	LRG	34.32	6.91	81.28	16.37	96.19	19.33
COMBINE CORN 2-38 SM	SML	22.91	15.38	53.42	35.87	62.96	42.28
COMBINE CORN 3-38 SM	SML	24.22	10.78	56.85	25.32	67.66	30.13
COMBINE CORN 4-38 MD	MED	32.25	10.78	76.02	25.40	90.50	30.24
COMBINE CORN 4-30 MD	MED	32.04	12.32	75.43	29.01	89.76	34.52
COMBINE CORN 6-30 LG	LRG	38.06	9.76	88.64	22.73	105.39	27.02
COMBINE CORN 8-30 LG	LRG	39.93	8.45	93.58	19.80	111.02	23.49
POTATO HRVSTR. 2ROW	120	17.46	7.01	76.84	30.86	92.05	36.97
BEEF LIFTER 3 ROW	100	13.06	5.03	58.79	22.61	70.21	27.00
BEEF LIFTER 4 ROW	100	13.75	3.97	66.23	19.11	79.04	22.81
BEEF LIFTER 6 ROW	120	17.71	3.41	90.66	17.44	108.17	20.80
BEEF TOPPER 3 ROW	60	7.84	2.45	33.92	10.60	40.44	12.64
BEEF TOPPER 4 ROW	75	9.82	2.30	40.92	9.60	48.56	11.39
BEEF TOPPER 6 ROW	100	12.71	1.99	47.28	7.39	56.38	8.81
BEEF WAGON 8TON	75	7.98		32.30		38.60	
LIGHT TRUCK	---	10.44		19.56		25.10	
MEDIUM TRUCK	---	16.44		28.09		36.40	
HEAVY TRUCK	---	26.63		41.97		54.57	
WAGON	40	4.29		19.72		23.75	
FORAGE WAGON 14FT	40	4.53		20.10		25.72	
FORAGE WAGON 16FT	40	4.63		20.46		26.23	