



## 2008-09 Machine Custom and Work Rate Estimates

Edited by: Dennis Stein, Extension Educator, District Farm Business Management, Michigan State University Extension  
362 Green Street, Caro MI 48723 ♦ 989-672-3870 ♦ email: steind@msu.edu ♦ webpage: <http://www.msu.edu/user/steind>

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\$3.15 per gallon of fuel

<b>TRACTORS:</b>		\$/Hour	Gal. / Hour	Est. Fuel Cost per Hour	
<i>(excluding operator and fuel costs)</i>	4WD - 260 hp.	\$84.59	11.44	\$36.04	
	MFWD - 200 hp.	\$68.17	8.8	\$27.72	
	MFWD - 130 hp.	\$46.45	5.72	\$18.02	
Est. Tractor Cost \$0.24/hp/hr.	2- WD - 75 hp.	\$21.22	3.3	\$10.40	
	2- WD - 40 hp.	\$12.39	1.76	\$5.54	
<b>TILLAGE OPERATIONS:</b>	Custom \$ per Acre <sup>1</sup>	Total Machine Cost per Acre <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres per Hour <sup>5</sup>	Gallon per Acre <sup>6</sup>
<i>Plowing: Moldboard (5 bottom)</i>	\$18.44	\$20.94	\$72.87	3.48	1.29
<i>Plowing: Rollover (5 bottom)</i>	\$19.75	\$23.00	\$81.65	3.55	1.70
<i>Chisel (15 ft.)</i>	\$13.96	\$10.25	\$87.13	8.50	0.64
<i>Chisel - front disk (16.3 ft.)</i>	\$15.20	\$12.44	\$114.57	9.21	1.04
<i>Disk-V.Ripper combo (17.6 ft. +15" deep)</i>	\$18.43	\$18.45	\$205.35	11.13	1.10
<i>Subsoiler 30" - 10 ft (12-15")</i>	\$17.63	\$17.75	\$124.25	7.00	1.30
<i>Discing - tandem (21 ft)</i>	\$11.40	\$10.44	\$127.58	12.22	0.49
<i>Field Cultivator (23 ft.) + incorp.</i>	\$12.50	\$6.50	\$106.60	16.40	0.34
<i>Field Cultivator (23 ft.)</i>	\$10.58	\$5.49	\$91.08	16.59	0.34
<i>Row Cultivate (12 rows)</i>	\$8.70	\$6.65	\$102.74	15.45	0.44
<i>Row Cultivate-high residue (12 rows)</i>	\$11.70	\$11.17	\$172.58	15.45	0.64
<i>Stalk Shredder (20 ft.)</i>	\$11.67	\$12.07	\$93.66	7.76	0.74
<i>Rotary Hoe (21 ft.)</i>	\$6.55	\$2.52	\$65.42	25.96	0.18
<i>Boom Sprayer-self-Prop. 60 ft.</i>	\$5.00	\$6.07	\$200.86	33.09	0.11
<i>Boom Sprayer-pull type 50 ft.</i>	\$6.40	\$2.66	\$68.12	25.61	0.10
<b>PLANTING:</b>	Custom \$ per Acre <sup>1</sup>	Total Machine Cost per Acre <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres per Hour <sup>5</sup>	Gallon per Acre <sup>6</sup>
<i>Planter: Conventional w/fert (12 x 30" rows corn or soys)</i>	\$15.00	\$10.05	\$140.70	14.00	0.34
<i>Planter: No Till (12 row)</i>	\$16.60	\$17.00	\$204.00	12.00	0.65
<i>Planter: Min Till (12 row)</i>	\$16.67	\$13.27	\$168.93	12.73	0.53
<i>Drill: No Till (15 ft.)</i>	\$15.28	\$18.53	\$117.85	6.36	0.81
<i>Drill: Press wheels - (20 ft)</i>	\$13.83	\$11.79	\$99.98	8.48	0.64
<i>Pest Control - scouting</i>	\$5.00/ ac				
<b>SUGAR BEETS:</b>	Custom \$ per Acre <sup>1</sup>	Total Machine Cost per Acre <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres per Hour <sup>5</sup>	Gallon per Acre <sup>6</sup>
<i>Sugar Beets: Planting (12 row)</i>	\$25.50	\$27.45	\$274.50	10.00	0.65
<i>Sugar Beets: Cultivation</i>	\$12.75	\$14.08	\$78.85	5.60	0.81
<i>Sugar Beets: Topper (6 rows)</i>	\$12.50	\$14.63	\$77.98	5.33	0.58
<i>Sugar Beets: Harvester (6 rows)</i>	\$65.00	\$73.52	\$222.77	3.03	2.24
<i>Sugar Beets: Cart ( 20 ton)</i>	\$15.00	\$29.13	\$151.48	5.20	1.80
<b>HARVESTING:</b>	Custom \$ per Acre <sup>1</sup>	Total Machine Cost per Acre <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres per Hour <sup>5</sup>	Gallon per Acre <sup>6</sup>
<i>Combine: (Corn - 8 row head)</i>	\$29.26	\$34.00	\$142.80	4.20	1.93
<i>Combine: (chopper head)</i>	\$31.80	\$36.00	\$151.20	4.20	2.00
<i>Combine, Cart &amp; Truck - Corn</i>	\$38.00	\$45.00			
<i>Combine: Small grains (20 ft head)</i>	\$26.08	\$31.42	\$213.34	6.79	1.31
<i>Combine: Soybeans (25 ft. head)</i>	\$27.78	\$28.41	\$151.99	5.35	2.02
<i>Combine, Cart &amp; Truck - Soybean</i>	\$34.40				
<i>Pick 2 row - Ear Corn + 3 wagons</i>	\$26.23	\$22.00	\$26.40	1.20	1.75
<i>Combine: Field Beans (belt pickup)</i>	\$40.00	\$49.83	\$186.86	3.75	3.40
<i>Added charge for GPS- mapping</i>	\$1.90				
<i>Pulling Dry Beans (knife 6 row)</i>	\$8.75	\$9.86	\$86.08	8.73	0.66
<i>Pulling Dry Beans (rod 6 row)</i>	\$9.50	\$8.63	\$75.34	8.73	0.66

<b>HARVESTING:</b>	Custom \$ per Acre <sup>1</sup>	Total Machine Cost per Acre <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres per Hour <sup>5</sup>	Gallon per Acre <sup>6</sup>
Dry Bean – windrowing (6 row)	\$9.00	\$13.20	\$115.24	8.73	0.66
Grain Cart	\$0.05/bu				
Chopping Forage - Pull type (2 row corn head)	\$2.50-\$4.00 per Ton	\$56.18	\$77.53	1.38	3.35
Chopping Forage - w/kernel processor	\$4.00 per Ton	\$60.00	\$82.80	1.38	3.94
Chopping Forage -Pull type Pickup head-12 ft	\$3.75 per Ton	\$22.25	\$73.65	3.31	1.40
Chopping Forage-Self-propelled (3 row corn head)	\$3.50- \$4.75 per Ton	\$48.00	\$122.40	2.55	4.92
Silo Filling-Tower silo: 1 Tractor, 1 Chopper & Driver, 2 Wagons	\$5.50 per Ton	\$6.50 / Ton			
Silo Bunker: Chopper and 3 forage wagons or 2 trucks	\$6.85 per Ton	\$5.75 / Ton			
Silage Bagging (9 ft diameter)	\$4.70 per ft.	\$3.05/ft			
Mowing	\$12.53	\$9.00			
Raking – Hay 9 ft.	\$6.79	\$5.47	\$30.09	5.50	0.50
Swather - Conditioner: Hay	\$10.95	\$11.06	\$48.66	4.40	
Mower-Conditioner: Pull-type (9 ft.)	\$14.12	\$12.73	\$55.88	4.39	0.40
Mower-Conditioner: Self Propelled (16 ft)	\$15.25	\$13.78	\$106.93	7.76	0.40
Mower-Conditioner: Rotary (12 ft)	\$10.75	\$9.04	\$78.92	8.73	0.44
Small Square Baling: Hay	\$0.52 / bale			3.50	0.75
Small Square Baling: Straw	\$0.50 / bale				
Baler - Sm Square: Mow, Rake & Handle	\$1.25- \$2.25 per bale				
Baler - Lrg Round: Mow, Rake & Handle	\$8.00-9.50/ bale				
Baling - 600-800 # bale	\$6.00- 7.25 / bale				
Baling - 1500 #- Large Round	\$ 8.50 -\$9.75 / bale			3.04	0.77
Baling – Large Square Hay	\$7.50- \$9.75 / bale			3.05	0.35
Baler 1000# Round/ w/wrapper per bale	\$13.21			3.01	0.88
<b>FERTILIZER:</b>	Custom \$ per Acre <sup>1</sup>	Total Machine Cost per Acre <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres per Hour <sup>5</sup>	Gallon per Acre <sup>6</sup>
Fertilizer Dry Bulk: Spreader Only	\$5.72				
Lime application	\$7.98	\$6.50			
Fertilizer- Liquid-Knifed In: Equip. Only	\$8.60				
Liquid-Sprayed: Equip. Only	\$7.70				
Fertilizer - Anhydrous: 21 ft.	\$8.72	\$6.50	\$72.80	11.20	0.63
Fertilizer - Anhydrous No-Till 32 ft.	\$9.70	\$5.75	\$97.81	17.01	0.41
Manure: Hauling-semi-solid (300 bu.)	\$37.28				
Manure: Pump, Hauling & Spreading - liquid (9500 gallon cap.)	\$10.50 per 1000 gallon				
Manure: Pump, Hauling & Injecting - liquid (9500 gallon cap.)	\$12.50 per 1000 gallon				
<b>MISCELLANEOUS WORK:</b>	Custom \$ per Acre <sup>1</sup>	Total Machine Cost per Acre <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres per Hour <sup>5</sup>	Gallon per Acre <sup>6</sup>
Ditch Mowing		\$27.72			
Grain Drying	\$0.045/pt./bu.				
Grain Storage	\$0.04 /bu./mo.				
Custom Farming- Corn	\$89.55	\$87.14	(all machine operations for growing & harvest)		
Custom Farming- Soybeans	\$78.50	\$71.71	(all machine operations for growing & harvest)		
Custom Farming- Small Grains	\$69.50	\$66.42	(all machine operations for growing & harvest)		

Labor charged for this table at a rate of \$10.50 per hour unskilled tasks and \$13.00 per hour for skilled labor (planter, sprayer, harvester).

Fuel cost is calculated by adding fuel, oil and lube calculated by adding 10% to the power fuel cost. \*\* \$3.15 base fuel price used.

**1 Custom \$ per acre:** Represents the rate obtained from surveys of actual farm data in 2006 & 2007 to do this type of machine work for another farm on a general basis. Higher or lower rates apply in each situation depending on crop conditions, soil conditions, size of fields and there locations. This number included machine, power unit & operator where needed. Values have been adjusted higher to reflect the change in power fuel costs above. 2007 Iowa Farm Custom Rate Survey, Iowa State University; Ohio Farm Custom Rates -2006, Ohio State University.

**3 Total Machine Cost / Acre:** Includes adjusted fuel cost\*\*, lubricants, repairs, maintenance, labor and overhead costs including depreciation. This could be considered as an estimate of the ownership cost and operation of this machine on a per acre basis. No profit or return to management, which would be necessary for on going enterprises were included in this number. Values are based on "Farm Machinery Economic Cost Estimates for 2007, University of Minnesota 09/2007.

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### HOW TO FIGURE YOUR MACHINE WORK RATES

If you are hiring or doing custom work, the following worksheet will help you determine the custom rate. Custom rates are based on tradition or rates usual set in the community, the bargaining positions of both parties (i.e., availability of machinery services and demand for machinery services in your local area) and cost of operating the machines on your farm.

Cost of ownership and operation can be determined as follows:

Ownership cost per unit (e.g., acre, bushel, ton, hour) using the *DIRT* 5:

1. Depreciation: $\frac{\text{original cost} - \text{salvage value}}{\text{years of use}}$	\$ _____
2. Interest: interest rate x AIV <sup>a</sup>	\$ _____
3. Repairs: estimated 2 to 5 % of original cost	\$ _____
4. Taxes: (0 in Michigan -i.e., no taxes on personal property used in agriculture)	\$ _____
5. Insurance: (estimated 0.5% x AIV for insurance premium)	\$ _____
6. Total ownership cost per year (add lines 1 thru 5)	\$ _____
A. Ownership cost per unit: total ownership cost ÷ estimated annual use (acre, hour, bushel, ton)	(A) \$ _____

#### Operating Cost per (acre, hour, bushel, ton)

1. Tractor: fuel (gallons of fuel per unit x price ÷ gallon) x 1.15 <sup>b</sup>	\$ _____
2. Machine: gas or fuel gallons per unit x 1.15 <sup>b</sup>	\$ _____
3. Labor: hours per unit x wage rate (if labor wage unit is per acre, bushel or ton multiply this wage by acres bushels or tons per hour to determine wage/hour)	\$ _____
B. Total operating cost per unit	(B) \$ _____
C. Total ownership and operating cost per unit	(A + B) \$ _____
D. Desired profit margin and / or risk premium	4.5 %
E. Custom Rate (per acre, hour, bushel, ton) $\text{Line C} \times [1 + (\text{Line D} \div 100)]$	\$ _____

a. Average investment value (AIV) = (original cost basis - salvage value) ÷ 2.

b. The addition of 15 percent above fuel cost is for oil & lube, maintenance.

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4 **Machine Rate per Hour:** This number takes the Total Machine Cost per Acre and factors in the estimated Acres per Hour to give a value that represents an estimate of the hourly operational and ownership cost of machinery supported by © University of Minnesota, Machinery Economic cost estimates for 2007. If the machine is run at full capacity (or engine clock hours) this per acre rate should be in the custom work value generated.

5 **Acres/ Hour:** This is an estimate of the acres this machine should average on a per hour basis with normal down time.

6 **Gal./ Acre:** This is an estimated machine use of fuel consumed to do this activity and is based on a factor of 0.044 gallons of diesel fuel per PTO horsepower-hour an on average. Your individual machines fuel use may vary from this number.

Costs were developed as an adjusted estimate of common rates being used by farms in this area to cover their cost of operation. The references listed below were used collectively to build the summary information listed above:

- Michigan State University Extension - E-2131 Custom Work Rates in Michigan. 10/2002 <http://www.aec.msu.edu/agecon/aecreports/aec613.pdf>
- © University of Minnesota - Machinery Economic cost estimates for 2008- 03/08 <http://www.apec.umn.edu/faculty/wlazarus/interests-farmmachinery.html>
- Iowa State University- 2008 Iowa Farm Custom Rates – FM1698 <http://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf>.
- USDA - Penn State University, Harrisburg PA: 2007 Machine Custom Rates <http://www.nass.gov/pa> - Pennsylvania Publications
- USDA - Wisconsin Department of Agriculture, Madison WI: Custom Rate Guide 2007 <http://nass.usda.gov/wi>

\* This report is a summary of information extracted from various sources. Your actual cost may vary greatly from the numbers presented. It is recommended that you calculate your own cost and economic returns necessary for the operation of machinery and equipment on your individual farm. Edited by Dennis Stein, Extension Educator, District Farm Business Management, MSU Extension. Revised on 11/2008. Major shifts in power fuel cost during the past year are having an impact on and have changed the cost of machine operational costs.

### HOW TO FIGURE YOUR MACHINE WORK RATES – example worksheet

If you are hiring or doing custom machine work, the following table may help you determine a machine work rate for your farm situation. Machine work rates should represent a value that will cover your total cost of operation and an allocation for overhead costs. The following are the basic components of developing your cost of ownership and operation for any given machine:

Ownership cost per unit (e.g., acre, bushel, ton, hour) using the *DIRT15*:

1. Depreciation: $\frac{\text{original cost} - \text{salvage value}}{\text{years of use}}$	base units \$15,000.00		\$15,000.00
	10		
2. Interest: interest rate x AIV <sup>a</sup>	0.07	int. %	\$525.00
3. Repairs: estimated 2 to 5 % of original cost	0.03	rpt. %	\$450.00
4. Taxes: (0 in Michigan -i.e., no taxes on personal property used in agriculture)			\$0.00
5. Insurance: (estimated 0.5% x AIV for insurance premium)	0.005	ins. %	\$37.50
6. Total ownership cost per year (add lines 1 thru 5)			\$2,512.50

A. Ownership cost per unit: total ownership cost ÷ estimated annual use (acre, hour, bushel, ton)	1000	units (A)	\$2.51
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Operating Cost per (acre, hour, bushel, ton)

1. Tractor: fuel (gallons of fuel per unit x price ÷ gallon)	5.5 \$2.50	units \$/gal	\$13.75
2. Machine: gas or fuel gallons per unit x 1.15 <sup>b</sup>			\$15.81
3. Labor: hours per unit x wage rate (if labor wage unit is per acre, bushel or ton multiply this wage by acres bushels or tons per hour to determine wage/hour)			\$4.00
B. Total operating cost per unit		(B)	\$19.81

C. Total ownership and operating cost per unit		(A + B)	\$22.33
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D. Desired profit margin and / or risk premium	5.0	%	
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E. Custom Rate (per acre, hour, bushel, ton) $\text{Line C} \times [1 + (\text{Line D} \div 100)]$			\$23.44
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- a. Average investment value (AIV) = (original cost basis - salvage value) ÷ 2.  
b. The addition of 15 percent above fuel cost is for oil & lube maintenance.