



2018 Custom Machine and Work Rate Estimates

FIRM Team Fact Sheet Number 18-01

Available at <https://msu.edu/user/steind/>

Authors: Bob Battel, Field Crops Educator and Dennis Stein, District Farm Business Management Educator, Emeritus
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2018 Production Season Costs

updated July 2018

Farm Labor Unskilled ⁷ = \$ per hour	\$14.60	\$2.75 per gallon of fuel
Farm Labor skilled ⁷ = \$ per hour	\$16.82	\$3.03 per gallon lube & fuel cost

TRACTORS ONLY:		max.	min.	Custom \$/Hour	Machine Cost \$/Hour	Est. Fuel Gal. / Hour	Est. Fuel Cost per Hour
No driver, or fuel cost	4WD - 260 hp.	\$ 148.10	\$ 63.20	\$105.65	\$113.76	11.44	\$34.66
	Tracks - 260 hp.				\$114.28		
	MFWD - 225 hp.	\$ 18.10	\$ 49.40	\$83.75	\$98.17	9.90	\$30.00
	MFWD - 130 hp.	\$ 82.90	\$ 40.70	\$61.80	\$52.30	5.72	\$17.33
Iowa=\$0.20/ hp-hour (fuel not included)	2- WD - 75 hp.	\$ 60.20	\$ 32.10	\$46.15	\$23.49	3.30	\$10.00
Est. Fuel use .044 gal. diesel/PTO hp / hour	2- WD - 40 hp.	\$ 27.80	\$ 27.80	\$27.80	\$10.20	1.76	\$5.33
Auto Steer systems charge per acre				\$2.89			

TILLAGE OPERATIONS:	Custom \$/Acre ¹	max.	min.	Total Machine Cost/ Ac ³	Machine Rate per Hour ⁴	Acres/Hr. ⁵	Est. Fuel Gal./Acre ⁶
Plowing: Moldboard (6 bottom)	\$20.25	\$ 39.13	\$ 7.50	\$27.43	\$114.38	4.17	1.32
Chisel Plow (23 ft.)	\$16.10	\$ 35.00	\$ 6.00	\$12.32	\$160.53	13.03	0.64
Chisel - front disk (16.3 ft.)	\$19.59	\$ 24.25	\$ 11.64	\$15.13	\$139.35	9.21	1.04
Vertical tillage	\$14.54	\$ 35.00	\$ 9.00				
Disk - V - Ripper combo (17.5 ft)	\$20.28	\$ 35.00	\$ 3.00	\$23.63	\$273.87	11.59	1.00
V-Ripper 30" O.C., 17 ft.	\$20.90	\$ 29.10	\$ 14.55	\$15.32	\$94.68	6.18	1.61
Subsoiler 30" - 10ft (12-15")	\$19.23	\$ 35.00	\$ 10.00				
Disk - tandem (21 ft)	\$13.36	\$ 21.34	\$ 7.28	\$13.57	\$165.83	12.22	0.74
Field Cultivator (23 ft.)	\$12.64	\$ 28.00	\$ 7.76	\$6.70	\$86.97	12.98	0.31
Harrow	\$8.90	\$ 16.49	\$ 5.82				
Soil Finisher	\$16.50	\$ 30.00	\$ 7.00				
Row Cultivate (12 rows)	\$12.25	\$ 30.00	\$ 6.00	\$8.47	\$130.86	15.45	0.46
Stalk Shredder (20 ft.)	\$12.40	\$ 40.00	\$ 3.00	\$14.53	\$112.75	7.76	0.74
Rotary Hoe (21 ft.)	\$8.64	\$ 15.52	\$ 4.85				
Land Rolling	\$7.28	\$ 11.64	\$ 3.88				
Highboy spraying	\$10.38	\$ 10.38	\$ 10.38				
Boom Sprayer - self-Prop.80ft.	\$6.69	\$ 20.00	\$ 4.09	\$4.28	\$188.83	44.12	0.07
Boom Sprayer - pull type 50ft.	\$6.33	\$ 16.00	\$ 1.00	\$4.59	\$211.55	46.09	0.12

PLANTING:	Custom \$/Acre ¹	max.	min.	Total Machine Cost/ Ac ³	Machine Rate per Hour ⁴	Acres/Hr. ⁵	Est. Fuel Gal./Acre ⁶
Planter- conventional - w/fert & insect 30" corn-soys	\$19.10	\$ 46.00	\$ 10.00	\$16.79	\$235.06	14.00	0.40
Planter- conventional no attachments	\$18.17	\$ 46.00	\$ 10.00	\$15.25	\$213.50	14.00	0.40
Planter only - notill	\$18.02	\$ 19.20	\$ 18.28				
Planter- soybean 15" rows	\$17.27	\$ 32.00	\$ 6.00				
Planter- No Till w/splitter & w/fert	\$18.56	\$ 31.04	\$ 14.55				
Planter- Min Till with fert&insect	\$18.36	\$ 19.20	\$ 17.51	\$16.79	\$213.74	12.73	0.53
Variable rate seeding	\$2.56	\$ 4.85	\$ 0.49				
Drill Soybeans Conventional	\$17.37	\$ 30.00	\$ 9.00				
Drill - AirSeeder with cart							
Drill - No Till (15 ft.)	\$20.82	\$ 30.00	\$ 10.00	\$25.18	\$160.14	6.36	0.90
Drill - No Till - drill only no tractor	\$13.49	\$ 13.49	\$ 13.49				
Drill Grain, press wheels	\$15.76	\$ 36.00	\$ 5.00	\$16.30	\$110.68	6.79	0.61
Grain drill- only-no tractor	\$10.90	\$ 10.90	\$ 10.90				
Seed Tender	\$2.76	\$ 5.82	\$0.00				
Pest Control - scouting	\$4.92	\$ 5.71	\$ 1.94				
Pest Control - scouting with drone	\$3.08	\$ 3.11	\$ 3.06				

HARVESTING:	Custom \$/Acre ¹	max.	min.	Total Machine Cost/ Ac ³	Machine Rate per Hour ⁴	Acres/Hr. ⁵	Est. Fuel Gal./Acre ⁶
Combine - (Corn)	\$33.10	\$ 60.00	\$ 8.00	\$40.45	\$274.66	6.79	2.00
Corn Head for Combine	\$9.16	\$ 11.64	\$ 6.79				
Combine - stalk chopper head	\$37.64	\$ 58.20	\$ 21.34	\$45.46	\$339.59	7.47	1.90
Combine Small grains (20 ft head)	\$27.76	\$ 38.80	\$ 17.50	\$42.66	\$289.66	6.79	2.04
Combine Soybeans (30 ft. head)	\$30.56	\$ 50.00	\$ 8.00	\$33.14	\$337.37	10.18	2.04
Combine Soybeans- air reel- flex	\$34.29	\$ 45.59	\$ 25.22	\$39.25	\$291.24	7.42	2.04
Soybean Head for Combine	\$9.21	\$ 9.70	\$ 7.76				
Combine, cart, haul to storage - Corn	\$45.57	\$ 87.30	\$ 25.10				
Combine, cart, haul to storage - Soybeans	\$42.47	\$ 82.45	\$ 23.80				
GPS mapping addition to harvesting	\$2.59	\$ 4.85	\$ 0.49				
Picker 2 row - Ear Corn + 3 wagons	\$31.16	\$ 33.22	\$ 29.10				
Grain Cart - corn / acre	\$8.60	\$ 13.55	\$ 1.94	\$23.89	\$164.12	6.87	1.44
Chopping Forage- Pull type	\$37.01	\$ 38.20	\$ 35.81	\$71.59	\$148.19	2.07	3.38
Chopping Forage-Self-propelled /hr	\$401.00	\$ 401.00	\$ 401.00				
Chopping Silage- Self propelled- per ton	\$10.38	\$ 100.00	\$ 5.24				
Chopping Haylage- Self propelled/ton	\$9.51	\$ 10.38	\$ 6.79				
Snaplage/ acre	\$59.07	\$ 67.90	\$ 50.44				
Bunk Filling- chop, haul, filling & packing / ton	\$11.18	\$ 15.05	\$ 6.79				
Silage Bagging per ft. (9 ft diameter)	\$9.17	\$ 14.55	\$ 1.00				
Mowing	\$13.33	\$ 32.00	\$ 7.00				
Raking	\$6.38	\$ 15.00	\$ 3.00	\$2.46	\$64.40	26.18	0.07
Tedding	\$7.69	\$ 15.00	\$ 3.00				
Windrowing - hay or straw	\$11.43	\$ 14.55	\$ 9.68				
Swathing hay or small grains (25 ft.)	\$14.31	\$ 36.00	\$ 7.50	\$21.31	\$258.28	12.12	0.32
Mower-Conditioner Pull-type (9 ft.)	\$14.21	\$ 19.40	\$ 11.64				
Mower-Conditioner- Self Propelled (16ft)	\$16.94	\$ 19.35	\$ 14.53				
Mower - Conditioner- Rotary (12ft)	\$13.70	\$ 14.53	\$ 12.88	\$10.86	\$94.81	8.73	0.38
Small Square Baling Hay per bale	1.02	\$ 3.00	\$ 0.25	\$16.64	\$72.55	4.36	0.40
Straw per bale	0.91	\$ 0.91	\$ 0.91				
Mow, Rake, Baler & Handle - small sq. per bale	2.02	\$ 2.02	\$ 2.02				
Wrapping Bales - per bale	\$4.84	\$ 4.84	\$ 4.84				
Baling Round- 600-800 # per bale	\$12.67	\$ 16.00	\$ 9.34				
Baling Round -1200 -1500 # per bale	\$11.78	\$ 16.50	\$ 5.00	\$12.66	\$119.64	9.45	0.35
Baler 1000# Round/ with wrapper	11.43	\$ 16.00	\$ 3.00				
Mow-Rake-Bale-fld Haul- Lrg. Round/bale	\$24.11	\$ 24.72	\$ 23.36				
Baling -1500 # Lrg. Round - straw/stalks	\$12.59	\$ 19.00	\$ 8.00				
Baling -1500 # Lrg. Round - corn stalks							
Baling -1500 # Lrg. Round - straw - with wrap	\$14.10	\$ 15.59	\$ 10.67				
Baling -1500 # Lrg. Round - Corn Stalks w/wrap							
Picking up w/accumulator- lrg.sq.bale	\$3.62	\$ 4.52	\$ 1.94				
Baling - Lrg Sqr. Hay 4x3x8	13.05	\$ 18.28	\$ 7.76	\$15.12	\$176.15	11.65	0.49
Hauling Round Bales/loaded mile	4.03	\$ 4.03	\$ 4.03				
Hauling square bales//loaded mile	2.55	\$ 6.00	\$ 0.26				
FERTILIZER:	Custom \$/Acre ¹	max.	min.	Total Machine Cost/ Ac ³	Machine Rate per Hour ⁴	Acres/Hr. ⁵	Est. Fuel Gal./Acre ⁶
Hauling round bales/loaded mile	\$4.03	\$ 4.03	\$ 4.03				
Hauling square bales//loaded mile	\$2.55	\$ 6.00	\$ 0.26				
Fertilizer Dry Bulk: Spreading	\$5.81	\$ 15.00	\$ 1.50				
Fertilizer dry Bulk Spreader only	\$3.65	\$ 5.82	\$ 1.94				
Lime application	\$8.47	\$ 10.67	\$ 2.91				
Fertilizer- Liquid-Knifed In	\$13.09	\$ 15.52	\$ 11.64				
Fertilizer - side dressing	\$11.04	\$ 14.55	\$ 6.31				
Liquid-Sprayed:	\$6.13	\$ 9.70	\$ 3.64				
Fertilizer- Anhydrous: 21 ft.	\$13.77	\$ 18.43	\$ 6.79				
Soil Testing - GPS grid samples	\$7.60	\$ 9.70	\$ 4.85				
Manure Hauling-semi-solid Load & Spread/hr.	\$116.64	\$ 121.25	\$ 97.00				
Liquid Manure Spreader Injected -1000 gal.	\$11.65	\$ 15.52	\$ 9.70				

FERTILIZER:	Custom \$/Acre ¹	max.	min.	Total Machine Cost/ Ac ³	Machine Rate per Hour ⁴	Acres/Hr. ⁵	Est. Fuel Gal./Acre ⁶
Liquid Manure spreader only /hr.	\$59.13	\$ 59.13	\$ 59.13				
Solid Manure spreader only /hr	\$59.13	\$ 59.13	\$ 59.13				
Liquid Manure injected Drag Line -1000 gal.	\$12.41	\$ 14.01	\$ 9.70				
Manure Pump, Hauling, Spreading - liquid (9500 gallon cap.) per hour	\$98.63	\$ 300.00	\$ 23.00				
Manure Pump, Hauling, Injecting 1000 gal. liquid (9500 gallon cap.)	\$12.70	\$ 13.98	\$ 11.42				
Bobcat/Skid Loader / hr.	\$62.29	\$ 90.00	\$ 18.00				
Mowing CRP or pasture / acre	\$20.51	\$ 29.10	\$ 9.70				
Ditch Mowing	65.91	\$ 106.70	\$ 24.25				
Brush Hogging / acre	\$35.71	\$ 35.71	\$ 35.71				
Grain Drying- continuous flow /point/ bu.	\$0.042	\$ 0.042	\$ 0.042				
Grain Drying - inbin dryer /point/bu.	\$0.048	\$ 0.25	\$ 0.02				
Grain Auger/ bu.	\$0.054	\$ 0.12	\$ 0.01				
Grain Auger only / bu	\$0.040	\$ 0.04	\$ 0.04				
Blower- silo filling / hour	\$21.50	\$ 21.50	\$ 21.50				
Grain Storage/ mo.	\$0.043	\$ 0.40	\$0.00				
Grain Storage for season	\$0.20	\$ 0.24	\$ 0.10				
Grain Haul - per bushel - field to farmstead	\$0.09	\$ 0.40	\$ 0.01				
Grain Haul - per bushel - farm to mkt 25mi	\$0.15	\$ 0.40	\$ 0.02				
Grain Haul per Loaded Mile	\$4.30	\$ 4.30	\$ 4.30				
Livestock Haul Trailer/ loaded mile	\$2.81	\$ 3.40	\$ 2.43				
Power Washing per hr.	\$44.86	\$ 48.50	\$ 38.80				
Rock picking	\$15.18	\$ 19.40	\$ 9.70				
Auto Steer System	\$1.50	\$ 1.50	\$ 1.50				
Machine storage square foot per year	\$0.53	\$ 0.53	\$ 0.53				
Custom Farming - Corn	\$114.37	\$ 213.40	\$ 67.90	(all machine operations for growing & harvest)			
Custom Farming - Soybeans	\$100.91	\$ 203.70	\$ 67.90	(all machine operations for growing & harvest)			
Custom Farming - Sm Grains	\$88.52	\$ 111.55	\$ 77.60	(all machine operations for growing & harvest)			

Fuel cost is calculated by adding fuel, oil and lub \$2.75 Fuel Price ==>

\$3.03

** base fuel & lube price used

- 1 Custom \$ per acre:** Represents the rate obtained from surveys of actual farm data surveys for 2017 & 2018 from Universities listed below 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 their locations. This numbers includeds machine, power unit & operator where needed. Values have been adjusted to reflect the change in power fuel costs noted above.
- 2 Custom \$ per acre:** Is the Custom \$ per acre: adjusted to reflet a fuel and lubrication from the base fuel price noted above.
- 3 Total Machine Cost/Acre:** Includes tractor, 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 2014, University of Minnesota
- 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 2014. 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 on an average. Your individual machines fuel use may vary from this number.
- 7 Labor cost:** charged for this table at a rate of \$14.60 per hour unskilled tasks and \$16.82 per hour for skilled labor (planter, sprayer, harvester), and does not include benefits. Costs were developed as an adjusted estimate of common rates being used by farms in this area to cover their cost of operation. Major shifts in power fuel cost during the past few year has had an impact on and has changed the cost of machine operational cost. As a thumb rule it is estimated that each \$1.00 increase in fuel cost, will increase most machine operations by an additional 15%.

- University of Minnesota, Machinery Economic cost estimates for 2018 © <http://wlazarus.cfans.umn.edu/william-f-lazarus-farm-machinery-management/>
- 2018 Iowa Farm Custom Rate Survey - Ag Decision Maker-Alejandro Plastina; <https://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf>
- Kansas Custom Rates Comparison for 2018, Gregg Ibendahi, <http://www.agmanager.info/machinery/papers/2016-rates-paid-kansas-farmers-custom-work>
- Kentucky-Custom Machinery Rates 2016, Greg Halich, March 2018, <https://www.uky.edu/Ag/AgEcon/pubs/customratesKY.pdf>
- University of Illinois - Machinery Cost Estimates © 6-2017, Univ. of Illinois @ <http://www.farmdoc.illinois.edu/manage/machinery/index.html>
- Wisconsin Custom Rate Guide 2017. https://www.nass.usda.gov/Statistics_by_State/Wisconsin/Publications/WI-CRate17.pdf
- Oklahoma Farm and Ranch Custom Rates, 2017-2018. <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-6752/CR-205%202013-2014web.pdf>

* 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. This document was compiled by: Bob Battel, Field Crops Educator, Michigan State University Extension. revised July 2018. 362 Green Street, Caro, Michigan 48723 email: battelro@msu.edu or web page: <http://www.msu.edu/user/steind/>

HOW TO FIGURE YOUR MACHINE WORK RATES

If you are hiring or doing custom work, the following will help you determine the custom rate. Custom rates are based on tradition or usual rates 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 DIRT1 5:

1. Depreciation: $\frac{\text{original cost} - \text{salvage value}}{\text{years of use}}$		\$ _____
2. Interest: interest rat x AIV ^a		\$ _____
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 (gallon fuel per unit x price/gallon) x 1.15 ^b		\$ _____
2. Machine: gas or fuel gallons per unit x 1.15 ^b		\$ _____
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		% _____
E. Custom Rate (per acre, hour, bushel, ton) Line C x [1+(Line D/100)]		\$ _____

a Average investment value (AIV) = (original cost basis + trade in value) ÷ 2.

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

Custom Machine rate calculator is available on line at Ohio State University: <http://aede.osu.edu/research/osu-farm-management/decision-tools>

Authors: Bob Battel, Field Crops Educator, Dennis Stein, District Farm Business Management Educator Emeritus, Michigan State University Extension
362 Green Street, Caro, Michigan 48723-1998 ♦ phone: 989.672.3870 ♦ email: battelro@msu.edu ♦ web: <http://www.msu.edu/user/steind>



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