



## 2017 Custom Machine and Work Rate Estimates

FIRM Team Fact Sheet Number 16-3

Available at <http://www.firm.msue.msu.edu>

Author : Dennis Stein, Senior District Farm Business Management Educator

Michigan State University Extension • November 2016

2017 Production season costs estimates								updated 11.09.16
Farm Labor Unskilled <sup>7</sup> = \$ per hour	\$13.50						1.99 per gallon of fuel	
Farm Labor skilled <sup>7</sup> = \$ per hour	\$16.40						2.19 per gallon lube & fuel cost	
Farm Labor- milking cows per hour	\$12.00							
<b>TRACTORS ONLY:</b>								
		max.	min.	Custom \$/Hour	Machine Cost \$/Hour	Est. Fuel Gal. / Hour	Est. Fuel Cost per Hour	
No driver, or fuel cost	MFWD - 260 hp.	\$92.30	\$57.20	\$71.67	\$106.51	11.44	\$25.00	
	MFWD - 200 hp.	\$140.00	\$45.00	\$52.52	\$73.29	7.04	\$15.38	
	MFWD - 130 hp.	\$100.00	\$40.00	\$35.74	\$47.48	5.72	\$12.50	
Est. Tractor Cost \$0.27/hp/hr.	2- WD - 75 hp.	\$90.00	\$30.00	\$22.70	\$24.49	3.3	\$7.21	
Est. Fuel use .044 gal. diesel/PTO hp / hour	2- WD - 40 hp.	\$65.00	\$20.00	\$13.82	\$9.03	1.76	\$3.85	
Auto Steer systems charge per acre	\$2.89							
<b>TILLAGE OPERATIONS:</b>								
	Custom \$/Acre <sup>1</sup>	max.	min.	Total Machine Cost/ Ac <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres/Hr. <sup>5</sup>	Est. Fuel Gal./Acre <sup>6</sup>	
Plowing: Moldboard (6 bottom)	\$19.20	\$35.00	\$10.00	\$24.06	\$100.33	4.17	1.32	
Chisel Plow (23 ft.)	\$15.45	\$26.00	\$7.00	\$10.35	\$134.86	13.03	0.64	
Chisel – front disk (16.3 ft.)	\$17.05	\$25.00	\$10.00	\$13.96	\$128.57	9.21	1.04	
Vertical tillage	\$15.31	\$25.00	\$8.00					
Disk-V.Ripper combo (22.5 ft)	\$23.15	\$35.00	\$14.00	\$22.23	\$257.65	11.59	1.61	
V- Ripper	\$17.31	\$35.00	\$10.00	\$15.72	\$97.15	6.18	1.10	
Subsoiler 30" - 10ft (12-15")	\$20.23	\$27.50	\$14.16					
Field Cultivator (23 ft.) + incorp.	\$13.61	\$20.00	\$8.50					
Field Cultivator (23 ft.)	\$12.77	\$25.00	\$7.00	\$7.09	\$92.03	12.98	0.34	
Harrow	\$9.16	\$13.00	\$5.00					
Soil Finisher	\$14.03	\$26.00	\$8.00					
Disk- Tandem 21 ft.	\$13.34	\$20.35	\$8.00	\$10.62	\$129.78	12.22	0.74	
Row Cultivate (12 rows)	\$11.90	\$20.00	\$8.00	\$7.73	\$119.43	15.45	0.46	
Row Cultivate-high residue (12rows)	\$12.32	\$16.00	\$7.00					
Stalk Shredder (20 ft.)	\$12.76	\$19.00	\$7.00	\$13.39	\$103.91	7.76	0.74	
Rotary Hoe (21 ft.)	\$9.13	\$15.00	\$5.00	\$0.00	\$0.00	25.96	0.18	
Land Rolling	\$7.45	\$12.00	\$5.00					
Highbay spraying	\$9.50							
Boom Sprayer-self-Prop.80ft.	\$7.49	\$18.49	\$4.00	\$3.96	\$174.72	44.12	0.07	
Boom Sprayer-pull type 90ft.	\$7.33	\$11.00	\$4.00	\$3.95	\$182.06	46.09	0.12	
<b>PLANTING:</b>								
	Custom \$/Acre <sup>1</sup>	max.	min.	Total Machine Cost/ Ac <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres/Hr. <sup>5</sup>	Est. Fuel Gal./Acre <sup>6</sup>	
Planter- 12 row -w/fert& insect 30" corn-soys	\$19.34	\$30.00	\$12.00	\$16.79	\$235.06	14.00	0.40	
Planter- 12 row no attachments	\$17.46	\$28.00	\$10.00	\$15.25	\$213.50	14.00	0.40	
Planter only	\$12.15							
Planter only- notill	\$13.50							
Planter- soybean 15" rows	\$19.19	\$22.00	\$10.00					
Planter- No Till w/splitter & wfert	\$20.65	\$30.00	\$12.00					
Planter- Min Till with fert&insect	\$19.31	\$33.50	\$12.00	\$16.79	\$213.74	12.73	0.53	
Planter conventional - Dry Beans	\$17.82	\$24.00	\$14.00					
GPS mapping addition to planting	\$3.00							
Variable rate seeding	\$2.48	\$5.00	\$0.00					
Drill Soybeans Conventional	\$15.50	\$22.00	\$9.00					
Drill-AirSeeder with cart-52ft	\$17.17			\$20.56	\$453.55	22.06	0.52	
Drill- No Till (15 ft.)	\$18.44	\$28.00	\$12.00	\$24.11	\$153.34	6.36	0.90	
Drill- No Till - drill only no tractor	\$12.40	\$18.00	\$9.00					
Drill Grain, press wheels (16ft)	\$15.23	\$22.00	\$10.00	\$15.01	\$101.92	6.79	0.61	
Grain drill- only-no tractor	\$10.50							
Seed Tender	\$3.15	\$6.00	\$0.00					
Pest Control- scouting	\$3.50	\$7.45	\$2.00					
Pest Scouting-with drone	\$2.55	\$4.00	\$1.00					

<b>SUGAR BEETS:</b>	Custom \$/Acre <sup>1</sup>	max.	min.	Total Machine Cost/ Ac <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres/Hr. <sup>5</sup>	Est. Fuel Gal./Acre <sup>6</sup>
Sugar Beets - Planting (12 row)	\$32.50	\$40.00	\$18.00		\$0.00	4.67	0.99
Sugar Beet Cultivation	\$16.50				\$0.00	5.60	0.81
Sugar Beet Topper	\$16.50				\$0.00	7.13	0.56
Sugar Beet Harvester	\$130.00	\$200.00	\$75.00		\$0.00	3.03	2.22
Sugar Beet Cart	\$35.00				\$0.00	5.20	1.80
<b>HARVESTING:</b>	Custom \$/Acre <sup>1</sup>	max.	min.	Total Machine Cost/ Ac <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres/Hr. <sup>5</sup>	Est. Fuel Gal./Acre <sup>6</sup>
Combine - 8 row (Corn)	\$35.50	\$55.00	\$23.00	\$36.01	\$244.51	6.79	2.00
Corn Head for combine	\$9.93	\$15.00	\$5.00				
Combine 12 row- stalk chopper head	\$40.10	\$57.00	\$26.00	\$49.86	\$372.45	7.47	1.90
Combine Small grains (20 ft head)	\$31.02	\$649.00	\$18.00	\$32.49	\$220.61	6.79	1.70
Combine Soybeans (30 ft. head)	\$31.59	\$52.00	\$22.25	\$24.89	\$253.38	10.18	1.70
Combine Soybeans- air reel- flex 25ft.	\$35.55	\$50.00	\$28.00	\$34.57	\$256.51	7.42	2.04
Soybean head for combine	\$9.45	\$13.25	\$6.00				
Combine, cart, haul to storage - Corn	\$38.96	\$85.00	\$23.82				
Combine, cart, haul to storage - Soybeans	\$37.14	\$37.50	\$23.11				
GPS mapping addition to harvesting	\$2.45	\$5.00	\$0.00				
Picker 2 row- Ear Corn + 3 wagons	\$31.39	\$35.00	\$25.00				
Combine Field Beans (belt pickup)	\$38.00	\$72.00	\$24.00	\$31.35	\$244.84	7.81	1.55
Pulling Dry Beans (knife 6 row)	\$9.75						
Pulling Dry Beans (rod 6 row)	\$10.15						
Dry Bean – windrowing (6 row)	\$9.75						
Grain Cart- corn / acre	\$6.13	\$11.00	\$2.00	\$15.99	\$109.85	6.87	1.44
Grain Cart only- corn / acre	\$3.25						
Chopping Forage- Pull type 3row	6.65			\$67.37	\$139.46	2.07	3.38
Chopping Forage -Pull type Pickup hd-10ft	\$9.50/ ton			\$32.58	\$107.84	3.31	1.40
Chopping Forage-Self-propelled 400 hp /hr	\$270/ hr.			\$177.52	per hour		
Chopping C.Silage-Self-prop 6row 625hp /hr	\$470/ hr.			\$233.28	per hour		2.58
Chopping Silage- Self propelled- per ton	\$7.01	\$10.50	\$5.00				
Chopping Haylage- Self propelled /Ton	\$7.89	\$12.00	\$7.50				
Snaplage / ton	\$4.92	\$15.00	\$4.00				
Silo Filling-Tower silo - per ton 1Tractor, 1Chopper & Driver, Wagons	10.75						
Bunk Filling - per ton Includes chop, haul, filling & packing	\$10.24	\$12.50	\$7.50				
Silage Bagging per ft. (9 ft diameter)	\$8.48	\$13.00	\$9.00				
Mowing	\$13.65	\$17.58	\$7.59				
Raking	\$6.37	\$2.00	\$3.00	\$2.89	\$75.66	26.18	0.07
Tedding	\$6.68	\$10.00	\$4.39				
Windrowing - hay or straw	\$11.23	\$17.00	\$11.00	\$14.57	\$176.59	12.12	0.32
Swathing hay or small grains	\$15.10	\$25.00	\$9.00	\$14.57	\$176.59	12.12	0.32
Mower-Conditioner Pull-type (9 ft.)	\$14.62	\$21.00	\$8.00				
Mower-Conditioner- Self Propelled (16ft)	\$15.50	\$19.00	\$10.00				
Mower - Conditioner- Rotary (12ft)	\$13.84			\$10.67	\$93.15	8.73	0.38
Small Square Baling /bale - Hay	\$0.91	\$1.07	\$0.34	\$15.51	\$67.62	4.36	0.40
Bale / Straw	\$0.85						
Mow, Rake, Baler & Handle - small sqr.	\$2.24	\$4.00	\$1.00				
Baler, Rake & Handle - Lrg Round	\$20.00/acre						
Complete Mow to Hay harvesting per ton	\$35.00						
Wrapping Bales	\$4.50	\$10.00	\$4.00				
Baling Round- 600-800 # per bale	\$9.61 per bale	\$17.00	\$5.78	\$10.70			
Baling Round -1200 -1500 #- per bale	\$10.79 per bale	\$16.00	\$5.75	\$9.19	\$86.85	9.45	0.35
Baler 1000# Round/ with wrapper	\$10.70 per bale	\$23.00	\$9.00	\$14.55	\$137.50	9.45	0.35
Mow-Rake-Bale-fld Haul- Lrg. Round/bale	\$19.30 per bale	\$30.00	\$10.00				
Baling -1500 #- Lrg. Round - stalks/straw	\$12.38 per bale	\$23.00	\$8.43				
Baling -1500#- Lrg. Round - stalks / straw - with wrap	\$13.90 per bale	\$16.00	\$10.00				
Picking up w/accumulator- lrg. sq. bale	\$3.83	\$4.00	\$3.00				
Hauling round bales / bale / loaded mile	\$3.75						
Hauling square bales/bale/loaded mile	\$0.09	\$0.19	\$0.01				
Baling – Lrg Sqr. Hay 4x3x6	\$10.50 per bale	\$10.00	\$2.50				
Baling – Lrg Sqr. Hay 4x3x8	\$12.25	\$21.00	\$6.00	\$14.10	\$164.27	11.65	0.49

<b>FERTILIZER:</b>	Custom \$/Acre <sup>1</sup>	max.	min.	Total Machine Cost/ Ac <sup>3</sup>	Machine Rate per Hour <sup>4</sup>	Acres/Hr. <sup>5</sup>	Est. Fuel Gal./Acre <sup>6</sup>
<b>Fertilizer Dry Bulk: Spreading</b>	<b>\$6.54</b>	\$12.00	\$2.00				
<b>Fertilizer dry Bulk Spreader only-</b>	<b>\$3.61</b>	\$5.00	\$2.00				
<b>Lime application</b>	<b>\$7.55</b>	\$13.48	\$3.00				
<b>Fertilizer- Liquid-Knifed In</b>	<b>\$11.56</b>	\$21.00	\$6.36				
<b>Fertilizer - side dressing</b>	<b>\$11.12</b>	\$15.00	\$6.00				
<b>Liquid-Sprayed:</b>	<b>\$7.25</b>	\$11.00	\$4.00				
<b>Fertilizer- Anhydrous: 21 ft.</b>	<b>\$12.95</b>	\$25.00	\$6.00				
<b>Soil Testing - GPS grid samples</b>	<b>\$7.05</b>	\$10.00	\$4.00				
<b>Manure Hauling-semi-solid &amp; Load &amp; Spread / hr.</b>	<b>\$128.46</b>	\$400.00	\$100.00				
<b>Liquid Manure Spreader Injected-1000 gal.</b>	<b>\$11.50</b>	\$17.00	\$10.00				
<b>Liquid Manure spreader only /hr.</b>	<b>\$55.00</b>						
<b>Solid Manure spreader only /hr</b>	<b>\$55.00</b>						
<b>Liquid Manure injected Drag Line -1000 gal.</b>	<b>\$12.58</b>	\$17.00	\$9.50				
<b>Manure Pump, Hauling, Spreading - liquid (9500 gallon cap.) per hour</b>	<b>\$86 / hour</b>						
<b>Manure Pump, Hauling, Injecting - 1000 gal. liquid (9500 gallon cap.)</b>	<b>\$12.00 per 1000 gal.</b>						
<b>Bobcat/Skid Loader / hr.</b>	<b>\$64.85</b>	\$85.00	\$20.00				
<b>Mowing CRP or pasture / acre</b>	<b>\$19.73</b>	\$25.00	\$12.00				
<b>Ditch Mowing</b>	<b>\$65 per hour</b>	\$100.00	\$25.00				
<b>Brush Hogging/ acre</b>	<b>\$22.30</b>	\$50.00	\$6.78				
<b>Grain Drying- continuous flow /point/ bu.</b>	<b>\$0.05/pt./bu.</b>	\$0.11	\$0.01				
<b>Grain Drying- inbin dryer /point/bu.</b>	<b>\$0.06/pt./bu.</b>	\$0.07	\$0.04				
<b>Grain Auger/ bu.</b>	<b>\$0.06</b>	\$0.10	\$0.01				
<b>Grain Auger only / bu</b>	<b>\$0.04</b>						
<b>Blower- silo filling / hour</b>	<b>\$20.00</b>						
<b>Grain Storage/ mo.</b>	<b>\$0.03/bu./mo.</b>	\$0.07	\$0.02				
<b>Grain Storage for season</b>	<b>\$ 0.21 per bu.</b>	\$0.44	\$0.04				
<b>Grain Haul - per bu.- field to farmstead</b>	<b>\$0.09/ up to 10 miles</b>	\$0.15	\$0.06				
<b>Grain Haul - per bu.- farm to mkt 25mi</b>	<b>\$0.17 up to 25 miles</b>	\$0.50	\$0.10				
<b>Grain haul per loaded mile</b>	<b>\$3.13</b>	\$4.25	\$2.00				
<b>Livestock hauling trailer/ loaded mile</b>	<b>\$2.76</b>	\$4.00	\$2.00				
<b>Power Washing per hr.</b>	<b>\$43.25</b>	\$50.00	\$35.00				
<b>Rock picking</b>	<b>\$13.83</b>	\$20.00	\$7.41				
<b>Backhoe /hour</b>	<b>\$91.48</b>	\$150.00	\$50.00				
<b>Auto Steer System</b>	<b>\$1.50</b>						
<b>Machine storage sqr. Ft. per year</b>	<b>\$0.53</b>						
<b>Custom Farming- Corn</b>	<b>\$121.12</b>	\$190.50	\$70.00	(all machine operations for growing & harvest)			
<b>Custom Farming- Soybeans</b>	<b>\$107.02</b>	\$170.00	\$60.00	(all machine operations for growing & harvest)			
<b>Custom Farming- Sm Grains</b>	<b>\$92.25</b>	\$111.13	\$67.31	(all machine operations for growing & harvest)			

Fuel cost is calculated by adding fuel, oil and lube cost then adding 15% to this power fuel cost.

**\$2.185** \*\* base fuel & lube price used **\$ 1.90**

**1 Custom \$ per acre:** Represents the rate obtained from surveys of actual farm data surveys for 2016 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. The rates listed included machine, power unit & operator where needed.

**2 Fuel \$ per acre:** adjusted to reflect fuel and lubrication (15% additional) from the base fuel price noted above.

As a thumb rule, it is estimated that each \$1.00 increase in fuel cost, will increase most machine operations by an additional 15%.

**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 2016, 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 2016. If the machine is run at full capacity (or engine clock hours) this per acre rate should be 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 the Machine Cost column at rate of \$18.00 per hour unskilled tasks and \$25.00 per hour for skilled labor (planter, sprayer, harvester). Costs were developed as an adjusted estimate of common rates being used by farms in this area to cover their cost of operation.

- University of Minnesota, Machinery Economic cost estimates for 2016 @ <http://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf>
- 2016 Iowa Farm Custom Rate Survey - Ag Decision Maker • Alejandro Plastina @ <http://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf>
- 2016 Pennsylvania 2016 Machinery Custom Rates, Adam Pike @ [https://www.nass.usda.gov/Statistics\\_by\\_State/Pennsylvania/Publications/Machinery\\_Custom\\_Rates](https://www.nass.usda.gov/Statistics_by_State/Pennsylvania/Publications/Machinery_Custom_Rates)
- Kansas Custom Rates Comparison for 2016, Gregg Ibandahi @ <http://www.agmanager.info/kansas-custom-rates-comparison-2016-0>
- 2016 Nebraska Farm Custom Rates, Jim Jansen & Roger Wilson @ <http://extension.unl.edu/statewide/colfax/2016-nebraska-farm-custom-rates-0>

- Kentucky-Custom Machinery Rates 2016 • Greg Halic, March 2016 @ <http://www.uky.edu/Ag/AgriculturalEconomics/pubs/CustomRatesKY.pdf>
- 2016 Ohio Farm Custom Rates, Barry Ward & F. John Barker @ <https://u.osu.edu/marrison.2/files/2016/06/OAM-Ohio-Farm-Custom-Rates-2016-wbn5aq.pdf>
- 2013 Custom Farm Work Rates on North Dakota farms, Dwight Aakre • <https://www.ag.ndsu.edu/pubs/agecon/market/ec499.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: Dennis Stein, District Farm Business Management, Extension Educator Michigan State University Extension, 362 Green Street, Caro, Michigan 48723. Contact information: Email: [steind@msu.edu](mailto:steind@msu.edu) or web page: [http://msue.anr.msu.edu/topic/info/farm\\_management](http://msue.anr.msu.edu/topic/info/farm_management) . Factsheet revised November 2016

<b>HOW TO FIGURE YOUR MACHINE WORK RATES</b>		
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.		
<b>Cost of ownership and operation can be determined as follows:</b>		
<b>Ownership cost per unit (e.g., acre, bushel, ton, hour) using the DIRT1 5:</b>		
1. Depreciation: $\frac{\text{original cost} - \text{salvage value}}{\text{years of use}}$		\$ _____
2. Interest: interest rat 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)	\$ _____
<b>Operating Cost per (acre, hour, bushel, ton)</b>		
1. Tractor: fuel (gallon fuel per unit x price/gallon) x 1.15 <sup>b</sup>		\$ _____
or		
2. Machine: gas or fuel gallons per unit		\$ _____
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 <b>operating cost</b> per unit	(A+B)	\$ _____
D. Desired profit margin and / or risk premium	4.500%	%
E. Custom Rate (per acre, hour, bushel, ton) Line C x [1+(Line D/100)]		\$ _____
a Average investment value (AIV) = (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>

<b>Author: Dennis Stein, District Farm Business Management Educator, Michigan State University Extension</b> 362 Green Street, Caro, Michigan 48723-1998 ♦ phone: 989.672.3870 ♦ email: <a href="mailto:steind@msu.edu">steind@msu.edu</a> ♦ web: <a href="http://www.msu.edu/user/steind">http://www.msu.edu/user/steind</a>	
	MSU is an affirmative-action, equal-opportunity employer, committed to achieving excellence through a diverse workforce and inclusive culture that encourages all people to reach their full potential. Michigan State University Extension programs and materials are open to all without regard to race, color, national origin, gender, gender identity, religion, age, height, weight, disability, political beliefs, sexual orientation, marital status, family status or veteran status. Issued in furtherance of MSU Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Thomas G. Coon, Director, MSU Extension, East Lansing, MI 48824. This information is for educational purposes only. Reference to commercial products or trade names does not imply endorsement by MSU Extension or bias against those not mentioned.