

# Machinery Cost Analysis Worksheet

Used to Determine:

1. Annual Ownership Costs (lines 1 & 2)
2. Operating Costs (lines 7 & 8)
3. Total Costs (line 9)
4. Own or Hire? Break-even Acres (line 12)

Machine \_\_\_\_\_

## Cost To Own And Operate Machine\*

Annual Ownership Costs = Purchase Price × Reference Table 1 Factor

1. Annual Ownership Cost = \$\_\_\_\_\_ × \_\_\_\_\_% ..... \$\_\_\_\_\_

2. Ownership Cost per Acre at my acreage (line 1 ÷ my acres) \$\_\_\_\_\_ ÷ \_\_\_\_\_A ..... \$\_\_\_\_\_/acre

Repairs = Purchase Price ÷ \$1,000 × Reference Table 2 factor

3. Repairs = \$\_\_\_\_\_ ÷ \$1,000 × \$\_\_\_\_\_/hour ..... \$\_\_\_\_\_/hr.

Fuel & Oil = Engine or PTO HP × Reference Table 3 factor × fuel cost

4. Fuel & Oil = \_\_\_\_\_HP × 0.0 \_\_\_\_\_ × \$\_\_\_\_\_/gal. .... \$\_\_\_\_\_/hr.

Tractor Cost\*\* (towed implements only) = Purchase Price ÷ \$1000 × Reference Table 4 factor

5. Tractor Cost = \$\_\_\_\_\_ ÷ \$1,000 × \$\_\_\_\_\_/hr. .... \$\_\_\_\_\_/hr.

6. Labor Costs for this machine's operation ..... \$\_\_\_\_\_/hr.

7. Total Operating Cost per Hour (add lines 3, 4, 5, and 6) ..... \$\_\_\_\_\_/hr.

8. Operating Cost per Acre (line 7 ÷ acres per hour) \$\_\_\_\_\_/hr. ÷ \_\_\_\_\_A/hr. .... \$\_\_\_\_\_/acre

9. Total Cost per Acre at my Acreage (line 2 + line 8) \$\_\_\_\_\_/A + \$\_\_\_\_\_/A ..... \$\_\_\_\_\_/acre

## Own Or Custom Hire?

10. Custom Rate per Acre ..... \$\_\_\_\_\_/acre

11. Custom Rate - Operating Cost (line 10 - line 8) \$\_\_\_\_\_/A - \$\_\_\_\_\_/A ..... \$\_\_\_\_\_/acre

12. Break-even Acres (line 1 ÷ line 11) \$\_\_\_\_\_ ÷ \$\_\_\_\_\_/A ..... \_\_\_\_\_acres

A. If line 9 is larger than line 10, then PENALTY FOR OWNING

is (line 9 - line 10) \$\_\_\_\_\_/A - \$\_\_\_\_\_/A ..... \$\_\_\_\_\_/acre

B. If line 10 is larger than line 9 then PENALTY FOR CUSTOM HIRING

is (line 10 - line 9) \$\_\_\_\_\_/A - \$\_\_\_\_\_/A ..... \$\_\_\_\_\_/acre

\*Use your values, if available. Otherwise use data in reference tables to determine estimates.

\*\*Use another worksheet to calculate your tractor costs or use Reference Table 4 factor to estimate it on this sheet.

Reference Table 1. Estimated Average Annual Ownership Costs (as a % of purchase price)  
(Depreciation, Interest, Insurance, and Housing)

Total Years of Expected Use	Interest Rate					
	2	4	6	8	10	12
1	92.2	93.3	94.4	95.5	96.6	97.7
2	47.2	48.3	49.4	50.5	51.6	52.7
3	32.2	33.3	34.4	35.5	36.6	37.7
4	24.7	25.8	26.9	28.0	29.1	30.2
5	20.2	21.3	22.4	23.5	24.6	25.7
6	17.2	18.3	19.4	20.5	21.6	22.7
7	15.1	16.2	17.3	18.4	19.5	20.6
8	13.5	14.6	15.7	16.8	17.9	19.0
9	12.2	13.3	14.4	15.5	16.6	17.7
10	11.2	12.3	13.4	14.5	15.6	16.7
11	10.4	11.5	12.6	13.7	14.8	15.9
12	9.7	10.8	11.9	13.0	14.1	15.2
13	9.1	10.2	11.3	12.4	13.5	14.6
14	8.6	9.7	10.8	11.9	13.0	14.1
15	8.2	9.3	10.4	11.5	12.6	13.7
16	7.8	8.9	10.0	11.1	12.2	13.3
17	7.5	8.6	9.7	10.8	11.9	13.0
18	7.2	8.3	9.4	10.5	11.6	12.7
19	6.9	8.0	9.1	10.2	11.3	12.4
20	6.7	7.8	8.9	10.0	11.1	12.2
21	6.5	7.6	8.7	9.8	10.9	12.0
22	6.3	7.4	8.5	9.6	10.7	11.8
23	6.1	7.2	8.3	9.4	10.5	11.6
24	6.0	7.1	8.2	9.3	10.4	11.5
25	5.8	6.9	8.0	9.1	10.2	11.3
26	5.7	6.8	7.9	9.0	10.1	11.2
27	5.5	6.6	7.7	8.8	9.9	11.0
28	5.4	6.5	7.6	8.7	9.8	10.9
29	5.3	6.4	7.5	8.6	9.7	10.8
30	5.2	6.3	7.4	8.5	9.6	10.7

Reference Table 2. Typical Repair Rates per \$1,000 of Purchase Price

<u>Machine/Implement</u>	<u>@ 1/8 Life</u>	<u>@ 1/4 Life</u>	<u>@ 1/2 Life</u>	<u>@ 3/4 Life</u>	<u>@ Full Life</u>	<u>Estimated Life (hours)</u>
2WD Tractors	0.021	0.042	0.084	0.126	0.168	12,000
4WD Tractors	0.012	0.024	0.048	0.072	0.096	16,000
Airblast Sprayer	0.139	0.211	0.320	0.408	0.485	2,000
Boom Sprayer	0.322	0.397	0.489	0.552	0.602	1,500
Chisel Plow	0.225	0.297	0.392	0.461	0.517	2,000
Combine, self-propelled	0.029	0.061	0.131	0.205	0.281	3,000
Corn Picker	0.053	0.131	0.322	0.545	0.793	2,000
Disk, Disk Harrow	0.116	0.188	0.306	0.406	0.497	2,000
Drill	0.106	0.228	0.489	0.765	1.049	1,500
Fertilizer Spreader	0.463	0.570	0.702	0.793	0.865	1,200
Field Cultivator, Springtooth Harrow	0.217	0.286	0.378	0.444	0.499	2,000
Forage Blower	0.104	0.180	0.314	0.435	0.548	1,500
Forage Harvester, pull-type	0.119	0.181	0.274	0.350	0.416	2,500
Forage Harvester, self-propelled	0.030	0.060	0.120	0.180	0.240	4,000
Forage Wagon	0.111	0.169	0.256	0.326	0.388	2,000
Moldboard Plow	0.172	0.300	0.522	0.722	0.909	2,000
Mower	0.296	0.481	0.782	1.038	1.270	2,000
Mower Conditioner	0.143	0.217	0.329	0.420	0.499	2,500
Planter, row-crop	0.106	0.228	0.489	0.765	1.049	1,500
Potato Harvester	0.167	0.220	0.291	0.342	0.384	2,500
Rake	0.149	0.197	0.260	0.306	0.343	2,500
Rectangular Baler (large)	0.082	0.143	0.249	0.344	0.433	3,000
Rectangular Baler (small)	0.136	0.238	0.414	0.572	0.721	2,000
Roller/Packer	0.137	0.169	0.208	0.235	0.256	2,000
Rotary Hoe	0.185	0.244	0.322	0.379	0.425	2,000
Rotary Mower	0.220	0.440	0.880	1.320	1.760	2,000
Rotary Mower Conditioner	0.100	0.200	0.400	0.600	0.800	2,500
Rotary Tiller	0.135	0.270	0.540	0.810	1.080	1,500
Round Baler	0.202	0.353	0.615	0.850	1.070	1,500
Row Cultivator	0.071	0.163	0.374	0.608	0.859	2,000
Wagon	0.184	0.227	0.279	0.315	0.343	3,000

Reference Table 3. Estimated Fuel and Lubrication Use per HP/hr

<u>Fuel Type</u>	<u>Fuel Usage</u>	<u>Fuel &amp; Lubrication</u>
Gasoline	0.060	0.069
Diesel	0.044	0.050
LP Gas	0.072	0.083

Reference Table 4. Estimated Average Tractor Costs per \$1,000 Purchase Price

<u>Total Years of Expected Use</u>	<u>Hours Used Per Year</u>	<u>Interest Rate</u>					
		2	4	6	8	10	12
5	100	2.02	2.13	2.24	2.35	2.46	2.57
	200	1.01	1.07	1.12	1.18	1.23	1.29
	300	0.67	0.71	0.75	0.78	0.82	0.86
	400	0.51	0.53	0.56	0.59	0.62	0.64
	500	0.40	0.43	0.45	0.47	0.49	0.51
10	100	1.12	1.23	1.34	1.45	1.56	1.67
	200	0.56	0.62	0.67	0.73	0.78	0.84
	300	0.37	0.41	0.45	0.48	0.52	0.56
	400	0.28	0.31	0.34	0.36	0.39	0.42
	500	0.22	0.25	0.27	0.29	0.31	0.33
15	100	0.82	0.93	1.04	1.15	1.26	1.37
	200	0.41	0.47	0.52	0.58	0.63	0.69
	300	0.27	0.31	0.35	0.38	0.42	0.46
	400	0.21	0.23	0.26	0.29	0.32	0.34
	500	0.16	0.19	0.21	0.23	0.25	0.27
20	100	0.67	0.78	0.89	1.00	1.11	1.22
	200	0.34	0.39	0.45	0.50	0.56	0.61
	300	0.22	0.26	0.30	0.33	0.37	0.41
	400	0.17	0.20	0.22	0.25	0.28	0.31
	500	0.13	0.16	0.18	0.20	0.22	0.24
25	100	0.58	0.69	0.80	0.91	1.02	1.13
	200	0.29	0.35	0.40	0.46	0.51	0.57
	300	0.19	0.23	0.27	0.30	0.34	0.38
	400	0.15	0.17	0.20	0.23	0.26	0.28
	500	0.12	0.14	0.16	0.18	0.20	0.23
30	100	0.52	0.63	0.74	0.85	0.96	1.07
	200	0.26	0.32	0.37	0.43	0.48	0.54
	300	0.17	0.21	0.25	0.28	0.32	0.36
	400	0.13	0.16	0.19	0.21	0.24	0.27
	500	0.10	0.13	0.15	0.17	0.19	0.21