



Kentucky Farm Machinery Economic Cost Estimates for 1996

Fred J. Benson, M.N. Mawampanga, and Larry D. Swetnam

The following information is designed as an aid in estimating farm machinery use costs for 1996. The costs are determined by formula and represent an average cost for a specific piece of machinery. These machinery costs are intended to be average estimates for the agricultural industry.

Salvage value at 10 years of life ranges from 16 percent to 30 percent. Repair and maintenance calculations are based on the *American Society of Agricultural Engineers Standards*.

There are two types of costs associated with owning and operating a machine: **Fixed costs**, which are incurred 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. It is assumed that a piece of equipment purchased new will be used commercially for 10 years even though it may be owned by several people.

List price, as shown in this publication, averages the list prices quoted by major machinery companies and reflects a 6 to 8 percent purchaser discount assuming that the purchasing power of the buyer exactly equals the sales tax, setup charges, and transportation costs. Interest and insurance rates are assumed to be 12.5 percent and .75 percent, respectively. Housing cost is assumed to be 75 cents per square foot of shelter space needed per year.

Formulas used to compute fixed machinery costs:

Depreciation per year = $\frac{\text{purchase price} - \text{investment credit} - \text{salvage value}}{\text{Years you will use the machine}} \times 0.85$

Interest per year = $\frac{\text{Purchase price} + \text{salvage value}}{2} \times \text{interest rate} \times 0.85$

Insurance per year = $\frac{\text{purchase price} + \text{salvage value}}{2} \times 0.85$

Housing per year = price per square foot \times square feet shelter required

Taxes per year = 0 (there are no property taxes on agricultural machinery in KY)

Operating Costs: Fuel cost is calculated by multiplying the fuel consumption by the price of fuel, with fuel consumption

assumed to be .06 gallons of diesel fuel per horsepower hour. The price of fuel is assumed to be \$1.00 per gallon for diesel. All power units, tractors, combines, trucks, etc., are assumed to be diesel powered. An estimate of gasoline consumption can 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 estimate total accumulated repair costs according to the accumulated hours of use; the total costs are then broken down to a per hour cost estimate. The amount of annual use of a machine is an estimate of the number of hours a commercial farmer would use that particular machine in one year.

Labor is assumed to be an hourly wage rate, which includes 30 percent of benefits, of \$6.25 per hour for unskilled labor and \$8.75 per hour for skilled labor. Labor per acre for an operation such as plowing and discing is calculated by using the work rate on the implement instead of the tractor. Therefore, plows and disks using the same tractor have different per acre labor requirements. Less labor per acre is used in a discing operation that covers more acres per hour than in a plowing operation.

Machinery prices remained about the same for 1995, compared with 1996, with slight price increases in some types of machinery and price declines in others.

These cost estimates are not everyone's cost, but are intended as a guide in planning the cropping operation. Individuals have unique costs because of differences in buying power, repair programs, average annual use, and overall replacement programs.

The following tables provide the 1996 machinery function costs broken down into several categories. Some relevant supporting data also are included.

Fred J. Benson is an Extension Economist in farm management, Mwana N. Mawampanga is a Post Doctorate Research Specialist in the Department of Agricultural Economics, and Larry D. Swetnam is a Research and Extension Specialist in Biosystems and Agricultural Engineering.

TABLE 1

SELECTED COSTS AND INFORMATION FOR TRACTORS AND COMBINE BASE UNITS

TRACTOR HP	NEW COST	-ANNUAL-		FIXED COSTS / HOUR	VARIABLE COSTS		-ANNUAL-		TOTAL COSTS / HOUR	SHELTER SPACE (SQ. FT)	REPAIR MAINT COST/HR	FUEL CONS. HOUR
		HRS USE	FIXED COSTS		COSTS / HOUR	VARIABLE COSTS	TOTAL COSTS					
40 HP	15175	500	1709	3.42	3.55	1775	3484	6.97	92	0.91	2.40	
60 HP	21700	500	2434	4.87	5.26	2631	5065	10.13	104	1.30	3.60	
75 HP	24100	500	2703	5.41	6.40	3198	5901	11.80	115	1.45	4.50	
100 HP	40050	550	4471	8.13	9.24	5084	9555	17.37	127	2.64	6.00	
120 HP	51900	550	5783	10.51	11.35	6240	12023	21.86	130	3.43	7.20	
140 HP	63515	550	7090	12.89	13.43	7388	14478	26.32	200	4.19	8.40	
160 HP	64350	600	7182	11.97	15.19	9116	16298	27.16	200	4.63	9.60	
180 HP	74520	600	8307	13.85	17.25	10347	18654	31.09	200	5.37	10.80	
225 HP 4WD	81200	500	9062	18.12	18.91	9455	18517	37.03	250	4.06	13.50	
250 HP 4WD	90400	500	10080	20.16	21.02	10510	20590	41.18	250	4.52	15.00	
275 HP 4WD	132100	500	14691	29.38	24.75	12378	27069	54.14	250	6.61	16.50	
300 HP 4WD	97650	500	10882	21.76	24.68	12341	23223	46.45	250	4.88	18.00	
320 HP 4WD	134100	500	14913	29.83	27.83	13913	28825	57.65	250	6.70	19.20	
350 HP 4WD	112270	500	12498	25.00	28.71	14357	26855	53.71	250	5.61	21.00	
SML COMBINE	75000	300	8706	29.02	36.74	11021	19726	65.75	300	30.14	6.00	
MED COMBINE	92000	300	10690	35.63	44.89	13466	24155	80.52	400	36.97	7.20	
LRG COMBINE	114500	300	13305	44.35	55.58	16673	29978	99.93	500	46.01	8.70	
JMB COMBINE	123000	300	14307	47.69	62.62	18787	33093	110.31	580	49.42	12.00	

TABLE 2
THE MACHINERY COST TABLE

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ACRE	TOTAL COST/HOUR	CASH COST/ACRE	TRACTOR IMPLEMENT	PER ACRE COST	DIESEL FUEL GAL/ACRE	
MB PLOW 2-16	40	786.00	1.16	139.29	12.55	14.57	3.40	6.00	1.06	5.49	2.07
MB PLOW 3-16	60	2165.00	1.75	209.45	11.35	19.80	3.63	5.80	1.89	3.65	2.06
MB PLOW 4-16	75	3069.00	2.33	279.10	9.83	22.86	3.41	5.07	2.01	2.74	1.93
MB PLOW 5-16	100	9541.00	2.91	348.74	13.06	37.94	4.81	5.98	4.88	2.19	2.06
MB PLOW 6-16	120	10418.00	3.49	453.82	12.41	43.33	4.83	6.26	4.32	1.83	2.06
MB PLOW 7-16	140	11880.00	4.07	529.27	12.25	49.89	4.85	6.47	4.22	1.57	2.06
MB PLOW 8-16	160	17254.00	4.65	604.71	12.55	58.37	5.23	5.84	5.34	1.37	2.06
MB PLOW 9-18	225	19819.00	5.89	883.64	12.01	70.77	5.21	6.29	4.65	1.08	2.29
MB PLOW 10-18	225	21480.00	6.55	981.82	11.16	73.06	4.84	5.66	4.53	.97	2.06
MB PLOW 12-18	275	24121.00	7.85	1178.18	11.95	93.85	4.98	6.89	4.24	.81	2.10
CHISEL PLOW 10 FT	75	5800.00	4.36	436.36	6.35	27.72	1.97	2.70	2.19	1.46	1.03
CHISEL PLOW 15 FT	120	4501.00	6.55	654.55	5.48	35.87	1.99	3.34	1.17	.97	1.10
CHISEL PLOW 17 FT	140	4899.00	7.42	741.82	5.53	41.05	2.06	3.55	1.13	.86	1.13
CHISEL PLOW 20 FT	160	6685.00	8.73	872.73	5.13	44.77	2.03	3.11	1.29	.73	1.10
CHISEL PLOW WING 24	225	11497.00	10.47	1047.27	5.89	61.65	2.22	3.54	1.74	.61	1.29
CHISEL PLOW WING 29	250	13278.00	12.65	1265.45	5.42	68.56	2.06	3.25	1.66	.50	1.19
CHISEL PLOW WING 35	300	14077.00	15.27	1527.27	4.91	75.05	1.97	3.04	1.46	.42	1.18
FIELD CULTIVATOR 12	75	4156.00	6.06	727.27	3.96	23.99	1.28	1.95	.96	1.05	.74
FIELD CULTIVATOR 18	100	3851.00	8.73	1047.27	3.35	29.24	1.20	1.99	.63	.73	.69
FIELD CULTIVATOR 28	160	9150.00	13.58	1629.09	3.38	45.83	1.34	2.00	.91	.47	.71
FIELD CULTIVATOR 37	225	11880.00	17.94	2152.73	2.95	52.95	1.27	2.06	.88	.01	.75
FIELD CULTIVATOR 50	250	20186.00	24.24	2909.09	3.05	74.00	1.14	1.70	1.09	.26	.62
DISK CHISEL 9 FT	100	6240.00	3.82	381.82	8.48	32.39	2.72	4.55	2.26	1.67	1.57
DISK CHISEL 11 FT	100	7250.00	4.91	638.18	6.52	32.00	2.20	3.54	1.68	1.30	1.22
DISK CHISEL 14 FT	100	8689.00	6.00	1200.00	5.24	31.46	1.96	2.90	1.29	1.06	1.00
MIN-TILL PLANTER 4-36	60	11678.00	3.56	249.45	12.48	44.47	2.67	2.84	6.79	2.85	1.01

TABLE 2, CONTINUED

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ACRE	TOTAL COST/HOUR	CASH COST/ACRE	TRACTOR IMPLEMENT	PER ACRE COST	LABOR	DIESEL FUEL GAL/ACRE
MIN-TILL PLANTER 6-36	75	15961.00	5.35	374.18	10.27	54.90	2.29	2.21	6.16	1.90	.84
MIN-TILL PLANTER 6-30	75	15643.00	4.45	311.82	12.17	54.21	2.72	2.65	7.24	2.28	1.01
MIN-TILL PLANTER 8-30	100	22296.00	5.94	415.76	12.34	73.30	2.93	2.92	7.71	1.71	1.01
MIN-TILL PLANTER 8-36	100	23409.00	7.13	498.91	10.60	75.54	2.49	2.44	6.74	1.42	.84
MIN-TILL PLANTER 12-3	160	33498.00	8.91	623.64	11.88	105.81	3.08	3.05	7.69	1.14	1.08
DISK 10 FT	60	5722.00	4.85	484.85	5.05	24.51	1.30	2.09	1.65	1.31	.74
DISK 12 FT	75	6164.00	7.76	775.76	3.48	27.00	.97	1.52	1.14	.82	.58
DISK 17 FT	75	11366.00	8.24	824.24	4.10	33.82	1.02	1.43	1.90	.77	.55
DISK 20 FT	100	11987.00	9.70	969.70	4.17	40.48	1.18	1.79	1.73	.66	.62
DISK 21 FT	100	12500.00	10.18	1018.18	4.03	41.06	1.13	1.71	1.70	.63	.59
DISK 24 FT	120	16454.00	11.64	1163.64	4.37	50.82	1.23	1.88	1.94	.55	.62
DISK 28 FT	140	18795.00	13.58	1357.58	4.30	58.43	1.24	1.94	1.90	.47	.62
DISK 32 FT	160	21788.00	15.52	1551.52	4.08	63.26	1.23	1.75	1.92	.41	.62
DISK 40 FT	180	30341.00	19.39	1939.39	4.06	78.65	1.17	1.60	2.12	.33	.56
DISK OFFSET 14 FT	140	9636.00	6.11	610.91	7.57	46.23	2.48	4.31	2.21	1.04	1.38
DISK OFFSET 16 FT	160	10410.00	6.98	698.18	6.90	48.20	2.44	3.89	2.10	.91	1.38
DISK OFFSET 18 FT	180	11145.00	7.85	785.45	6.77	53.21	2.45	3.96	2.00	.81	1.37
DISK-WING OFFSET 21	225	13570.00	9.16	916.36	6.79	62.22	2.33	4.04	2.05	.70	1.47
DISK-WING OFFSET 23	225	17745.00	10.04	1003.64	6.75	67.78	2.20	3.69	2.43	.64	1.35
LANDPLANE 45-12 FT	180	7500.00	6.40	480.00	8.40	53.75	3.01	4.86	2.49	1.05	1.69
LANDPLANE 55-14 FT	225	15000.00	8.00	600.00	9.30	74.41	2.87	4.63	3.83	.84	1.69
LANDPLANE 70-14 FT	225	16000.00	7.47	560.00	10.31	76.96	3.11	4.96	4.44	.90	1.81
SPRINGTOOTH DRAG 30	60	3491.00	16.00	480.00	1.97	31.54	.37	.63	.92	.42	.22
SPRINGTOOTH DRAG 48	75	4360.00	30.25	1058.91	1.17	35.52	.24	.39	.56	.22	.15
CORN PLANTER 4-36	40	9283.00	4.58	320.73	7.96	36.49	1.51	1.52	4.23	2.22	.52
CORN PLANTER 6-36	60	16376.00	6.87	481.09	7.87	54.06	1.63	1.47	4.91	1.48	.52

TABLE 2, CONTINUED

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ACRE	TOTAL COST/HOUR	CASH COST/ACRE	TRACTOR IMPLEMENT	PER ACRE COST	DIESEL FUEL GAL/ACRE	
CORN PLANTER 6-30	60	14276.00	5.73	400.91	8.69	49.79	1.83	1.77	5.15	1.77	.63
CORN PLANTER 8-30	75	21384.00	7.64	534.55	8.63	65.90	1.86	1.55	5.75	1.33	.59
CORN PLANTER 12-30	100	32416.00	11.45	801.82	8.22	94.12	1.84	1.52	5.81	.89	.52
GRAIN DRILL PW 12 FT	40	7986.00	4.78	382.25	6.71	32.05	1.45	1.46	3.22	2.03	.50
GRAIN DRILL PW 14 FT	40	8296.00	5.57	445.96	5.86	32.67	1.27	1.25	2.87	1.74	.43
GRAIN DRILL PW 16 FT	60	9934.00	6.37	509.67	6.12	38.97	1.48	1.59	3.00	1.52	.57
GRAIN DRILL PW 20 FT	75	11907.00	7.96	637.09	5.58	44.46	1.43	1.48	2.88	1.22	.57
GRAIN DRILL PW 24 FT	75	14284.00	9.56	764.51	5.13	49.03	1.30	1.24	2.88	1.02	.47
GRAIN DRILL PW 28 FT	100	17180.00	11.15	891.93	5.40	60.16	1.48	1.56	2.97	.87	.54
CULTIVATOR 4-36	40	6111.00	4.65	465.45	4.76	22.13	1.05	1.50	1.86	1.40	.52
CULTIVATOR 6-36	60	3537.00	6.98	698.18	3.14	21.90	.87	1.45	.75	.93	.52
CULTIVATOR 8-30	75	4742.00	7.76	775.76	3.26	25.27	.96	1.52	.90	.84	.58
CULTIVATOR 12-30	140	8934.00	11.64	1163.64	3.91	45.55	1.32	2.26	1.09	.56	.72
RIDGE-CULT 4-36	75	4899.00	4.65	465.45	5.45	25.37	1.61	2.54	1.50	1.41	.97
RIDGE-CULT 6-36	100	7222.00	6.98	698.18	4.91	34.26	1.55	2.49	1.48	.94	.86
RIDGE-CULT 8-30	100	6292.00	5.82	581.82	5.64	32.84	1.83	2.99	1.54	1.12	1.03
RIDGE-CULT 12-30	160	12563.00	12.36	1236.36	4.00	37.24	1.21	1.87	1.43	.70	.64
ROTARY HOE 16	40	2986.00	10.86	434.42	2.15	23.37	.37	.64	.93	.58	.22
SPRAYER 30 FT	40	3255.00	14.18	1134.55	1.72	24.46	.34	.49	.46	.77	.17
SPRAYER 50 FT	60	4733.00	23.64	2363.64	1.23	29.12	.30	.43	.34	.46	.15
SPRAYER HI PRES 50FT	60	28240.00	23.64	2363.64	2.79	65.85	.71	.43	1.89	.46	.15
ANHYDROUS APPLICATOR	160	14338.00	12.73	509.09	6.94	88.32	2.01	2.13	4.15	.65	.75
FERTILIZER SPDR	60	459.00	38.79	1163.64	.55	21.39	.14	.26	.08	.21	.09

TABLE 2, CONTINUED

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ACRE	TOTAL COST/HOUR	CASH COST/ACRE	PER ACRE COST TRACTOR IMPLEMENT	LABOR	DIESEL FUEL GAL/ACRE	
SHREDDER 12 FT	60	6250.00	4.36	436.36	5.80	25.32	1.54	2.32	2.05	1.43	.82
MOWER-COND 9 FT	60	10608.00	4.09	327.27	8.60	35.17	1.88	2.48	4.44	1.68	.88
SWATHER-COND. 12 FT	---	17954.00	5.45	436.36	7.00	38.16	.94	.00	5.85	1.15	.55
SWATHER-COND. 15 FT	---	18585.00	6.82	545.45	5.77	39.37	.76	.00	4.86	.92	.44
SWATHER 12 FT	---	28635.00	5.82	465.45	9.40	54.68	1.06	.00	8.32	1.07	.52
SWATHER 15 FT	---	29205.00	7.27	581.82	7.67	55.79	.86	.00	6.81	.86	.41
SWATHER 18 FT	---	30267.00	8.73	698.18	6.60	57.64	.73	.00	5.89	.72	.34
SWATHER 20 FT	---	31721.00	9.70	775.76	6.19	60.03	.67	.00	5.55	.64	.31
BALER PTO TWINE	40	15100.00	3.78	756.36	8.40	31.77	2.54	1.84	3.99	2.57	.63
ROUND BALER 1500 LB	60	19480.00	4.64	927.27	7.82	36.24	2.80	2.18	4.13	1.50	.78
ROUND BALER 1000 LB	60	16500.00	3.01	602.73	11.08	33.39	3.94	3.36	5.41	2.30	1.19
ROTARY MOWER	40	1150.00	2.73	272.73	5.60	15.26	1.50	2.55	.75	2.29	.88
RAKE (HYD)	40	4144.00	3.49	698.18	5.12	17.87	1.61	2.00	1.33	1.79	.69
FORAGE HARV. 1 ROW	60	14530.00	.95	94.55	42.67	40.34	9.10	10.71	21.68	10.27	3.81
FORAGE HARV. 2 ROW	100	15986.00	1.65	165.45	30.05	49.72	7.81	10.50	13.68	5.87	3.63
FOR HARV 2 ROW SP	---	68970.00	2.04	305.45	40.76	83.01	9.62	.00	35.99	4.77	3.63
FOR HAR 3 ROW SP	---	80322.00	3.05	458.18	31.10	95.01	7.43	.00	27.92	3.18	2.78
FORAGE BLOWER LG	60	3375.00	1.00	50.00	24.77	24.77	5.71	10.13	8.39	6.25	3.60
CORN PICKER 2-36	40	18890.00	1.42	212.73	25.41	36.04	5.66	4.91	13.65	6.85	1.69
PICKER-SHELLER 2-ROW	60	16832.00	1.49	223.36	24.93	37.13	6.21	6.80	11.61	6.52	2.42
COMBINE SM GRAIN SML	SML	5200.00	4.10	819.39	19.51	79.91	9.29	16.05	1.08	2.37	1.46
COMBINE SM GRAIN MED	MED	7500.00	5.67	1134.55	17.03	96.63	8.25	14.19	1.13	1.71	1.27
COMBINE SM GRAIN LGE	LRG	8700.00	7.88	1575.76	14.86	117.06	7.34	12.68	.94	1.23	1.10
COMBINE SOYBEANS SML	SML	8000.00	4.14	827.27	19.89	82.28	9.38	15.90	1.65	2.35	1.45
COMBINE SOYBEANS MED	MED	9700.00	5.52	1103.03	17.85	98.47	8.59	14.60	1.49	1.76	1.31
COMBINE SOYBEANS LGE	LRG	11000.00	6.89	1378.79	17.26	119.01	8.47	14.49	1.36	1.41	1.26

TABLE 2, CONTINUED

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST TRACTOR IMPLEMENT LABOR	DIESEL FUEL GAL./ACRE
COMBINE CORN 3-30 SM	SML	7350.00	1.77	354.55	46.11	81.73	21.79	37.09	3.38
COMBINE CORN 2-38 SM	SML	5800.00	1.49	297.82	54.01	80.42	25.67	44.16	4.03
COMBINE CORN 3-38 SM	SML	8536.00	2.25	449.09	36.84	82.73	17.34	29.28	2.67
COMBINE CORN 4-36 MD	MED	10500.00	2.84	567.27	34.96	99.17	16.78	28.39	2.54
COMBINE CORN 4-30 MD	MED	12000.00	2.60	520.00	38.61	100.39	18.45	30.97	2.77
COMBINE CORN 6-30 LG	LRG	17500.00	3.90	780.00	31.91	124.46	15.40	25.62	2.23
COMBINE CORN 8-30 LG	LRG	22000.00	4.73	945.45	27.14	128.29	12.95	21.14	1.84
COMBINE CORN 12-30 J	JMB	32000.00	7.09	1418.18	20.74	147.03	9.99	15.56	1.69
LIGHT TRUCK	---	15000.00	1.52	606.06	12.50	18.94	5.42	.00	1.32
MEDIUM TRUCK	---	30000.00	1.52	606.06	19.73	29.90	9.74	.00	1.65
HEAVY TRUCK	---	55000.00	1.52	606.06	32.35	49.02	17.56	.00	2.75
MANURE SPREADER 150	75	3960.00	3.49	349.09	7.65	26.72	2.91	3.38	1.29
MANURE SPREADER 245	100	5931.00	3.49	349.09	10.46	36.50	4.26	4.98	1.72
MANURE SPREADER 350	100	8500.00	4.65	465.45	9.02	41.99	3.72	3.73	1.29
GRAVITY BOX 185 BU	40	1545.00	1.65	215.09	9.52	15.75	2.54	4.21	1.45
GRAVITY BOX 240 BU	40	1711.00	1.65	215.09	9.67	16.00	2.58	4.21	1.45
HAY WAGON	40	2143.00	3.78	945.45	5.79	21.90	1.25	1.84	.63
FORAGE WAGON 14 FT	40	6760.00	1.65	215.09	13.66	22.59	3.87	4.21	1.45
FORAGE WAGON 16 FT	40	7303.00	1.65	215.09	14.01	23.18	4.01	4.21	1.45
MEDIUM TRUCK (USED)	---	14500.00	1.52	606.06	12.68	19.21	5.65	.00	1.65
HEAVY TRUCK (USED)	---	45000.00	1.52	606.06	27.80	42.12	14.92	.00	2.75

Educational programs of the Kentucky Cooperative Extension Service serve all people regardless of race, color, age, sex, religion, disability, or national origin. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, C. Oran Little, Director of Cooperative Extension Service, University of Kentucky College of Agriculture, Lexington, and Kentucky State University, Frankfort. Issued 6-96, 2000 copies.