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BENCHMARK MACHINERY VALUES ON GRAIN FARMS

Machinery costs represent a significant proportion of total costs on grain farms. Machinery depreciation, machinery repairs, fuel, machinery hire and leasing, utilities, and light vehicle expense account for an average of 16 percent of the total economic costs on grain farms enrolled in the Illinois Farm Business Farm Management (FBFM) Association. There also is considerable variability in machinery costs across farms, with more profitable farms tending to have lower per acre machinery costs (see *Illinois Farm Economics: Facts and Opinions*. “Do Some Farms Consistently Have Higher Profits than Other Farms?” FEFO 01-15, July 20, 2001).

Farms with higher machinery costs may have higher machinery values. This paper reports benchmark machinery values for grain farms of different sizes. A farmer can compare his machinery values to the benchmarks presented in this paper to determine whether machinery values are high or low. Having high or low machinery values does not necessarily indicate that a farm has a problem with machinery costs. However, having either high or low machinery values suggests that a farmer should evaluate his machinery practices.

Data for the benchmarks come from farms enrolled in FBFM. To be included in the benchmarks, a farm had to receive the majority of revenue from grain operations and had to have balance sheet data that included a fair market valuation for machinery. In addition, the farm had to receive less than \$20 per operator acre from custom work. This criterion eliminated farms that perform a large amount of custom work. A total of 1,682 meet the above criteria and are summarized in this paper.

Machinery includes all tractors, combines, planters, drills, and tillage equipment. It also includes grain hauling equipment such as grain carts and trucks. Machinery also includes pickups and other light duty trucks that are used in the farm business.

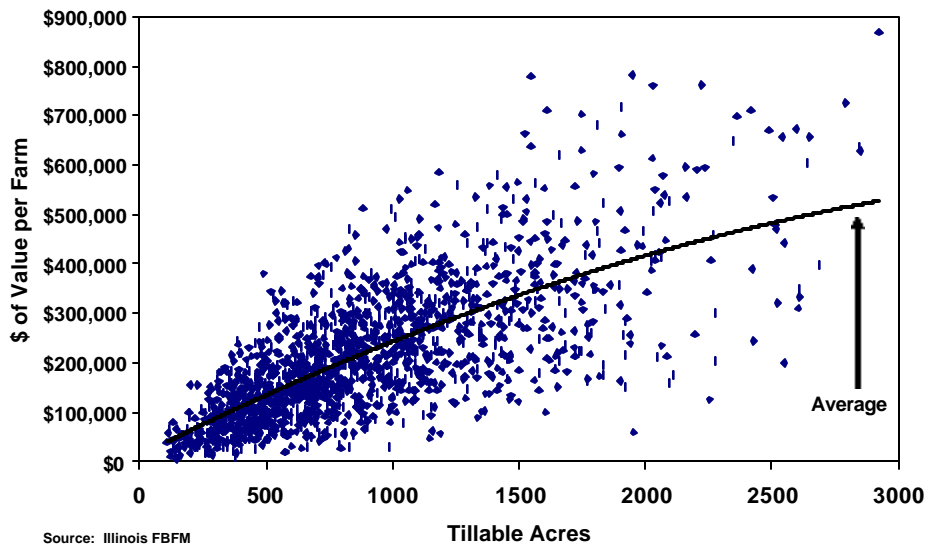
Fair Market Values

The fair market value (FMV) of machinery represents an estimate of the amount of money a farmer would receive if all machinery is sold. Estimates of FMVs are somewhat subjective. One individual could assess the FMVs of a farm’s machinery dramatically different than another individual.



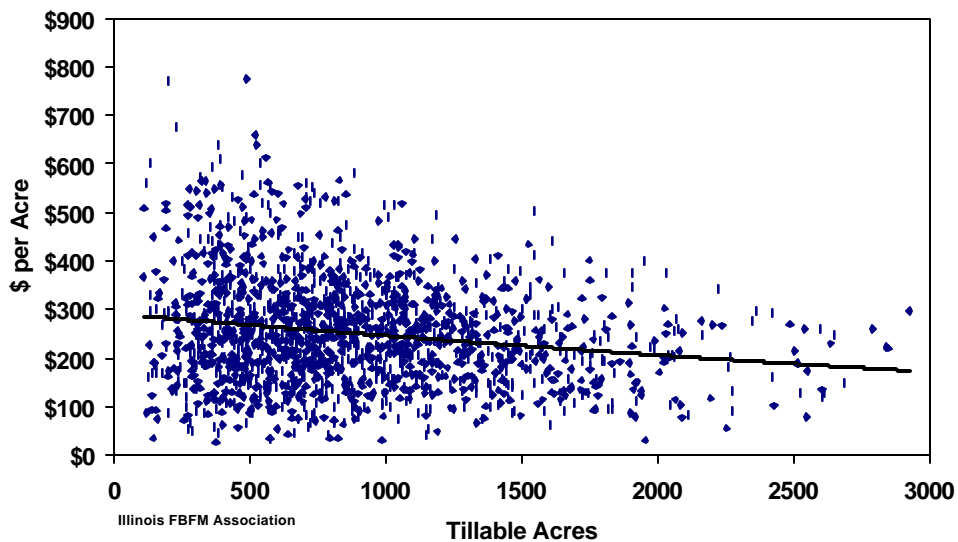
Figure 1 shows a scatter plot of the FMVs for the 1,682 grain farms enrolled in FBFM. Each point represents a farm's FMV, with the FMV indicated on the vertical axis and tillable acres denoted on the horizontal axis. The line labeled "average" shows the trend in FMVs as tillable acres increase.

Figure 1. Fair Market Value of Machinery on Illinois Grain Farms, 2000.



The average line in Figure 1 suggests that FMVs increase as tillable acres increase. On a per acre basis, however, average FMV declines as tillable acres increase. This trend is shown in Figure 2 which shows per acre machinery values. For an 875 acre farm, the median FMV is \$218,750, or \$250 of FMV per tillable acre. At 1,350 acres, the FMV is \$236 per acre, \$14 per acre less than the FMV for the 875 acre farm.

Figure 2. Per Acre Fair Market Value of Machinery on Illinois Grain Farms, 2000.



There is considerable range in FMVs such that a larger farm will not necessarily have a lower per acre FMV than a smaller farm. Table 1 quantifies the variability in per acre FMVs. Each row of Table 1 shows a row of farms and breakpoint per acre FMVs for different percentages. Take for example, the 751 to 1,000 acre farm size category. The break point at a 5 percent level is \$97 per acre. This means that 5 percent of the farms have FMVs less than \$97 per acre while 95 percent have FMVs above \$97. Further breakpoints for the 751 to 1,000 size category are \$168 per acre for the 20 percent level, \$209 per acre for the 35 percent level, \$279 for the 65 percent level, \$332 for the 80 percent level, and \$416 at the 95 percent level.

Table 1. Distribution of Per Acre Machinery Fair Market Values, Illinois Grain Farms, 2000.

Tillable acres size category	Percent of farms below						
	5%	20%	35%	50%	65%	80%	95%
Less than 500 acres	\$93	\$163	\$207	\$253	\$301	\$375	\$518
501 to 750 acres	93	162	212	249	289	343	517
751 to 1,000 acres	97	168	209	250	279	332	416
1,001 to 1,500 acres	101	157	202	236	271	311	397
1,501 to 2,000 acres	94	131	167	204	235	280	376
Over 2,000 acres	82	127	182	206	249	268	298

Source: Illinois FBFM Association.

Comparisons of a farm's own FMV to those in Table 1 will show a farm's relative position in FMV among farms. Take, for example, a 1,200 acre farm that has a \$165 per acre FMV. This farm's FMV is between the 20 percent breakpoint of \$157 per acre and 35 percent breakpoint of \$202 per acre for farms between 1,001 and 1,500 acres. This means that somewhere between 20 and 35 percent of the farms have lower per acre FMVs than this farm. This farm has lower costs than the majority of similarly sized farms summarized in Table 1.

Cost Values

Table 2 shows per acre machinery cost values. Cost values equal the sum of the adjusted taxable basis for each piece of machinery owned by a farm. Hence, a farm can sum the adjusted tax basis of all machinery and then divide by the number of tillable acres to arrive at a per acre cost value. This value can be used to find a farm's rank in Table 2.



Table 2. Distribution of Per Acre Machinery Cost Values, Illinois Grain Farms, 2000.

Tillable acres size category	Percent of farms below						
	5%	20%	35%	50%	65%	80%	95%
Less than 500 acres	\$0	\$7	\$18	\$31	\$46	\$75	\$138
501 to 750 acres	1	17	29	41	57	79	133
751 to 1,000 acres	7	21	35	45	57	75	118
1,001 to 1,500 acres	14	30	44	60	74	94	145
1,501 to 2,000 acres	8	29	45	62	74	91	132
Over 2,000 acres	24	30	50	69	83	100	124

Source: Illinois FBFM Association.

Cost values are much lower than FMVs because depreciation schedules for income tax purposes generally result in a quicker write-off than their actual drop in FMV. In addition, using the section 179 expense election magnifies this difference.

A significant portion of farms have no cost value, indicating that their machinery is completely depreciated. This is particularly true for the smaller tillable acre categories. In the less than 500 acre category, the 5 percent breakpoint is \$0, indicating the 5 percent of the farms have \$0 taxable basis in their machinery.

Summary

Comparing FMVs and cost values to breakpoints in Tables 1 and 2 will indicate whether a farm has high, average, or low values. Having high values may indicate that a farm has relatively high costs. These high costs can result from having too much equipment on a farm, having too large of equipment on a farm, or trading equipment too often. Having low values also may indicate cost difficulties. These farms may have older equipment that results in high repair costs.

However, these comparisons are only suggestive. A farm can also compare machinery cost to determine whether costs are high. Machinery cost benchmarks are provided in *Illinois Farm Economics: Facts and Opinions*, "Per Acre Machinery Costs on Illinois Grain Farms," FEFO 01-09, April 17, 2001.

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