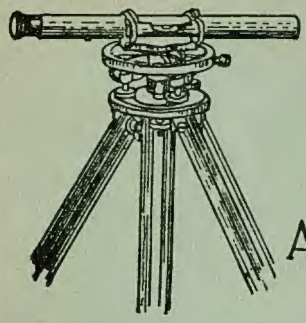

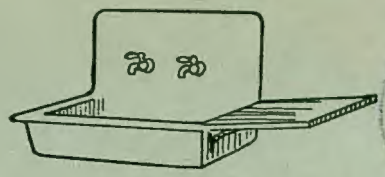

AGRICULTURAL ENGINEERING NEWS LETTER

AGRICULTURAL EXTENSION DIVISION
UNIVERSITY OF MINNESOTA

UNIVERSITY FARM, ST. PAUL—SEPTEMBER 15, 1937—NO. 66

TRACTOR OPERATING COSTS

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The use of the tractor for farm work is increasing rapidly. It is estimated that the number of tractors in use in Minnesota on April 1, 1936 was about one third the total number of farms. Because of the rapid change from horses to tractors and because in many cases the tractor is depended on to perform a large number of operations on the farm, there is a keen interest in the subject of tractor operating costs.

The cost per hour of operating a tractor of certain size and type varies somewhat with existing conditions such as number of hours use per year, nature of tractor work (heavy or light), kind of fuel used, and care given the tractor. Each farm represents an individual case. It is necessary, therefore, for an operator to determine the cost of using his particular tractor if he wishes to have reliable information applicable to his individual conditions.

In attempting to analyze the cost of doing work with a tractor, it is advisable first to determine the cost of using the tractor per year. This sum divided by the number of hours of use per year will give the cost per hour. Tractor costs are usually divided into two groups: fixed costs and operating costs. Fixed costs are such as depreciation, interest and housing, which are a certain amount each year regardless of how much the tractor is used. Operating costs are those costs that vary directly with the amount of use. They consist of such items as fuel, lubricants, labor, and repairs.

Fixed Charges

The annual depreciation is obtained by dividing the first cost by the life of the tractor in years. If an operator wishes to determine the cost of using his tractor, it is necessary to estimate the probable life. Such estimates are sometimes difficult to make. Some data are available on the life of tractors which are useful in this connection. It is natural for an owner to make the estimate high, but from the standpoint of obtaining a cost figure that is reliable and that would likely be slightly too high than too low, it is desirable to make a conservative estimate of the life in years.

While the life depends somewhat on the amount of use per year, there is no definite relation between the amount of such use and the life. Obsolescence or going out of date is an important factor in useful life. It is also true that any piece of machinery depreciates a certain amount each year regardless of how much or how little it is used. Available data indicate that tractors operating as high as 1,000 hours per year have a useful life of 7 or 8 years. In some cases where the annual use is less the life is 12 to 15 years or longer.

It is difficult to determine when the useful life of a tractor ends. With good care and constant and timely repairs the average tractor that is made today will last a long time. However, as time goes on, breakages occur, and from the standpoint of dependability and expense of repair it becomes profitable to exchange the old tractor for a new one. It is also true that an old machine on which breakages are expected to occur is not so dependable as a new one. Necessary delays in the busy season are sometimes costly.

The interest charge is based on the average value. Since the value when the tractor is new is the purchase price, and since it has become zero when the tractor is completely worn out, the average value is one-half of the purchase price $\left(\frac{\text{purchase price} + 0}{2}\right)$. Thus, if the purchase price is $1,200 and the rate of interest is 6 per cent, the interest charge per year is 6 per cent of $600 or $36. This is the amount that should be charged as interest each year throughout the life of the tractor.

The cost of housing varies with the type of shelter. A method often used that appears to be about as fair as any is to make a certain charge per square foot of area occupied by the machine. This charge will vary with the cost of the shelter from about 2 to 5 cents per square foot.

Operating Costs

Operating costs can easily be determined by the operator himself if he will keep a simple record of the fuel and lubricants used for the tractor. The cost of repairs can readily be determined in a similar manner. The labor charge is to include labor required for servicing and light repairing necessary to keep the tractor in good working order.

Total Costs

The following table shows hourly tractor costs that were obtained on a number of Minnesota farms in 1936. These data represent the average of 21 tractors.

	Two-Plow Tractors	Three-Plow Tractors
Fixed Charges		
Depreciation	$.212	$.289
Interest at 6%	.060	.098
Housing at 4¢ per sq. ft.	.006	.006
Total	$.278	$.393
Operating Costs		
Fuel	.153	.275
Lubricants	.036	.045
Repairs	.036	.086
Labor	.019	.028
Total	.244	.434
Total Cost per Hour	$.522	$.827

For the tractors in the 2-plow group, the cost per hour varied from $0.333 to $0.857. The number of hours in use during the year varied from 184 to 1,190. For the 3-plow tractors the cost per hour varied from $0.534 to $1.19 and the number of hours in use during the year varied from 231 to 606. In each case, the tractor with the largest number of hours of use had the lowest cost per hour. Generally speaking, the cost per hour increases as the number of hours of work per year decreases.

Published in furtherance of Agricultural Extension Acts of May 8 and June 30, 1914, F. W. Peck, Director, Agricultural Extension Division, Department of Agriculture, University of Minnesota, cooperating with U. S. Department of Agriculture