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Which Tractor? Gasoline or Diesel

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which tractor? gasoline or diesel

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The use of diesel power is on the increase. In 1963 tractors with diesel engines made up more than 46% of all wheel tractors above 9 horsepower sold in the United States. In the future higher percentages will be diesel tractors because of the continuous increase in size and horsepower of tractors.

A diesel tractor should save you money if: (1) you use the tractor at least 600-800 hours per year, (2) you are operating a large tractor of at least 60 power-take-off (PTO) hp, (3) you can buy diesel fuel for at least 2 to 3 cents less per gallon than gasoline (after tax refund).

THE BASIC NEED FOR ECONOMY

A tractor is a large investment and tractor power is a costly source of energy. It is important to correctly select size of tractor and type of engine to assure highest net return. Errors made in selection will reduce the profit of a farming operation.

MAKE-UP OF TRACTOR COSTS

Total yearly tractor costs are made up of depreciation, interest, fuel, labor, repair and maintenance, insurance, shelter and taxes. We cannot predict what the exact costs of a machine will be, we can only estimate them.

Fuel and labor are variable costs, because they vary directly with number of hours of use per year. These costs can be easily estimated if the yearly tractor use is known.

The other costs (depreciation, repair and maintenance, interest, insurance, shelter and taxes) are not as easy to estimate. Yearly depreciation depends on the estimated useful service life of a tractor. However, if it is traded in after a few years, depreciation will be governed more by age rather than remaining useful service life. Repair and maintenance costs depend on usage, care, and operating conditions. A combination of depreciation, interest, repair and maintenance, insurance, taxes and shelter costs can be related to the purchase price of a machine. Thus, it is possible to state the average yearly cost of these “combination” items as a percentage of the purchase price. These costs are often referred to as overhead costs. For most tractors this would be 15% to 18%. If a tractor is well cared for and used less than the average, the lower figure should be used when estimating tractor costs. If the tractor is used more than average and in severe service the higher figure should be used.

FUEL ECONOMY

A diesel engine burns less of a lower priced fuel than a gasoline engine so a diesel tractor saves on per hour operating costs. But a diesel tractor costs more initially. This increases both yearly and per-hour-of-operation overhead costs. Normally, it is only profitable to use diesel fuel when the savings on fuel costs exceed the increased overhead costs of a diesel tractor.

DETERMINING ECONOMIC EFFICIENCY

Several factors determine whether gasoline or diesel tractors are more economical to operate: (1) difference in initial investment, (2) hours of annual use, (3) size of tractor, and (4) fuel prices. Repair and maintenance costs are about the same for both over a long period of time so are not included in the cost comparison. Diesel engines require repair less frequently than gasoline engines but individual repair costs are higher.

HOW TO USE CHARTS

Use the charts (next page) for quick estimation of total cost difference per hour of operation between diesel and gasoline tractors of equal horsepower rating. They are based on the assumption that repair and maintenance costs are the same for diesel and gasoline tractors and that other overhead costs, excluding repair but including depreciation, interest, insurance, taxes and shelter, are about 13% of the purchase price. Fuel consumption data used for fuel cost figures are for average overall tractor usage computed from Nebraska Test data.

Before using the charts you must know: (1) extra investment for diesel tractor over a gasoline tractor including cost of extra fuel storage facilities, (2) tractor PTO horsepower rating, (3) hours of annual use, and (4) fuel costs for diesel oil and gasoline after tax refund.

Follow instructions for using the charts to determine “increased overhead costs” and the “fuel savings” per hour of operation. The difference will give you either the net savings or additional costs if a diesel tractor is used.

OTHER ITEMS TO CONSIDER

Investigate availability of service for a diesel engine before you buy. Repairs on diesel engines require skilled mechanics with special training. Special tools and testing facilities are needed to repair fuel pumps and injectors. Repair parts for these items are usually not as readily available as replacement parts for spark ignition systems.

A diesel engine usually has better lugging ability than a gasoline engine. This is a difficult factor to evaluate. An item not to neglect is the evaporation loss in gasoline storage tanks. Fire hazards are reduced when handling diesel fuel.

Usually diesel engines are harder to start in cold weather than gasoline engines. At very low temperatures excessive wear occurs until the engine is warmed up. This is especially true for the delicate and expensive injection system. For this reason a diesel tractor should not be used for daily chores that are of short duration.
instructions for using charts

1. Determine the difference in initial investment. (Include extra cost of fuel storage facilities). Start with Chart I at this figure.

2. Draw a line straight up until you meet the line indicating the hours expected annual tractor use. Then from that point draw a straight line to the right and observe the increased overhead cost per hour.

3. Determine extra cost of gasoline, after tax refund, above diesel fuel in cents per gallon.

4. Enter Chart II at the price you are paying for gasoline (after tax refund). Draw a straight line to the right until you meet the line indicating the extra cost of gasoline as determined in (3) above. Then draw a line straight up to the line in Chart III indicating the PTO horsepower of the tractors you want to compare. Then draw a straight line to the left and observe the fuel savings per hour.

5. If the increased overhead cost figure is smaller than the fuel savings figure compute the difference. The annual savings will be the difference times the total hours of use per year.

NOTE: If the increased overhead cost figure (obtained in step 2) is greater than the fuel savings figure then it does cost you more to run a diesel tractor.

Example:

You want to know if it pays to buy a diesel rather than gasoline tractor if they are in the 70 PTO hp class and used 600 hours a year. Assume extra investment over a gasoline tractor is $700 and gasoline costs (after tax refund) 17 cents per gallon and diesel fuel 15 cents per gallon.

Start with Chart I and find the "$700" point (a) along the horizontal line "extra initial investment." Go straight up vertically from the $700 point to the "600" hour annual use diagonal line (b). Then go right horizontally to the "increased overhead cost" line (c). You will see that the increased overhead cost is 15 cents per hour.

To determine fuel savings in cents per hour use Chart II, going right horizontally from the 17 cents point on "gasoline cost per gallon" line (d) to the diagonal line (e) representing "fuel cost difference" of 2 cents per gallon. Then go straight up vertically (into Chart III) to the 70 "tractor PTO horsepower" diagonal line (f). From there go left horizontally to the "fuel savings" line (g). This shows per hour fuel savings of 22 cents.

Thus, net savings per hour when using a diesel tractor are 22 cents fuel savings less 15 cents increased overhead costs or 7 cents per hour of operation (h). If the tractor is used 600 hours per year the net annual saving is $42.00 (i) when using a diesel tractor instead of a gasoline tractor.

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Most Economical Fuel

Differences

\( \Delta \) 7¢ NET SAVINGS PER HOUR

\( \Delta \) \( 7¢ \times 600 \) HOURS = $42.00 NET SAVINGS PER YEAR
PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300