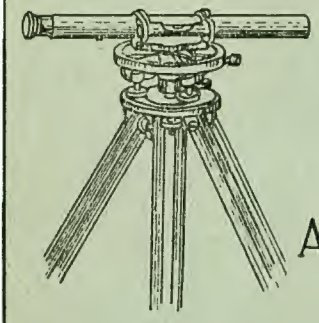

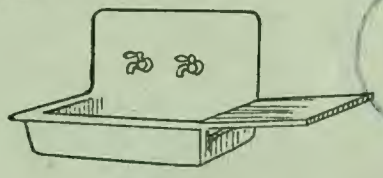


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Characteristics of Tractor Power

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During recent years tractors have become increasingly important as a source of power on Minnesota farms. Studies of farm power show that the average tractor has replaced from 3 to 3½ horses. Since the average farm tractor is equivalent to more than 3½ horses, the power supply on tractor farms is greater since the tractor has been added than it was before.

When a tractor is added to equipment on the farm the machinery and the method of performing the field operations are usually adapted to animal power. The tractor is fitted into this situation in a manner that calls for the fewest possible changes in methods and practices. The primary reason for acquiring the tractor, in most instances, is to relieve the horses of such heavy field work as plowing, disking, and harrowing, and to make it possible to perform these operations more rapidly than is possible with horses.

The Tractor Furnishes Power in Various Forms

The tractor owner and operator must appreciate the peculiar characteristics of tractor power if this power is to be used to best advantage. He must appreciate first of all that the tractor is usable not only for drawbar work, but will also furnish belt power and power in the form of rotary motion which may be transmitted from the engine of the tractor directly to the machine which is being drawn. From 50 to 75 per cent of the power that is generated in the engine of the tractor is available at the drawbar. A much larger proportion is available at either the belt or the power take-off shaft. When a drawn implement such as the binder, corn picker, or mower is being driven by means of the power take-off, the maximum available power at the power take-off is reduced by the amount consumed at the drawbar. The maximum power available at the drawbar is also reduced because of that used by the power take-off.

Peculiarities of Tractor Drawbar Power

The characteristics which perhaps are most important in adjusting farm work to tractor power, are those which characterize tractor drawbar work, especially. The tractor is a power unit which is larger than that which the farmer has been accustomed to. For field work it is equivalent to eight or more horses. It cannot be divided into smaller units as is possible with a team of horses. When using horses the farmer hitches two horses to a two-horse load, and uses six or eight horses only when the load is so large as to justify that much power. The cost per hour of operating the tractor is practically the same whether it is developing its greatest load or only one third its load. If, therefore, a seven-foot disk harrow is being drawn with the tractor when it is capable of drawing a ten-foot harrow, the cost per acre of both power and labor is very much higher when using the smaller machine.

The cost of power and labor per acre is least when the tractor is loaded nearly to its maximum capacity. On the average diversified farm it is not always possible or practical to do that with any one operation, such as operating the grain drill or the smoothing harrow. Machines large enough to load the tractor to its full capacity would often be impractical on relatively small fields and on average size farms.

Frequently two or more operations may be performed at the same time. Examples of possible combinations are the grain drill and the smoothing harrow, the disk and the smoothing harrow, and the roller or pulverizer and the harrow. Other combinations may be worked out on the individual farm in accordance with the type of farming and conditions on the particular farm.

Tractor field work need not be discontinued because of hot weather. By changing operators it is possible to operate from twenty to twenty-two hours per day. On some farms the tractor is used from daylight to dark during certain seasons of the year. Such practices make it possible to perform certain operations in a relatively short time, and for some work, all of the work might be done at the optimum time.

The tractor makes possible a relatively wide range in the rate of travel. Most farm tractors have three speeds forward and one reverse. The high speed usually is somewhere between 3 and 4½ miles per hour. Consequently it is possible to cover a larger acreage per day with the tractor pulling the same size implement than is possible with horses. Slow and steady rates of travel which are desirable for the first cultivation of corn or for drawing the hay loader are readily available with the tractor. If the tractor is pulling a load which can readily be handled under average conditions, and if a hill or soft ground is encountered, a greater effective pull on the implement may be obtained for the emergency period by shifting into a lower speed. The possibility of changing rates of travel is important when determining the size of implement to use with a tractor. It provides an overload capacity, which is a very important item when handling relatively large loads.

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