

creased at the expense of efficient work. The tractor is permitting him to do better work by giving him the power that is needed to run the most efficient machinery that can be made. The machine designer does not now have to limit his implements to machines that a team will handle; he is permitted to regard them from the stand point of efficiency alone.

Only the farmer himself realizes how many times he has been forced to begin his plowing or seeding or harvesting before the ground or the crop was ready because at best the last part of the work would be delayed until later than it ought to be. With a twenty-five acre field to plow and fit for each man and team not less than twenty days would be required, of which perhaps ten would be within the time when the crop should be sowed and the ground in the best condition. During the first five days of the fitting the ground would be getting late; but if the farm work was planned to the best mechanical advantage and the harvesting of the field to be done all at once as it should be, none of the field was sowed until all was fitted. Then, how many of us can tell the story of a large field almost ready for drill or planter when a three days' rain suspended operations for at least a week, made relitting necessary, and brought planting almost hopelessly late? Not less than thirty per cent of the world's output in farm crops—her possible output—is lost annually because of unseasonable seeding.

The small tractor for the 150 to

300-acre farms is plowing, fitting and seeding fifteen to twenty acres a day; an output to cover the entire farm it is intended for within the usual best seeding season, and enough to complete in one or two days the usual field of any one crop on a mixed farm of that size. Some of the farming moguls of the West are multiplying this output by three, and could, if run the full twenty-four hours, as they may be required, have a couple of townships in growing crops at the end of the average seeding season.

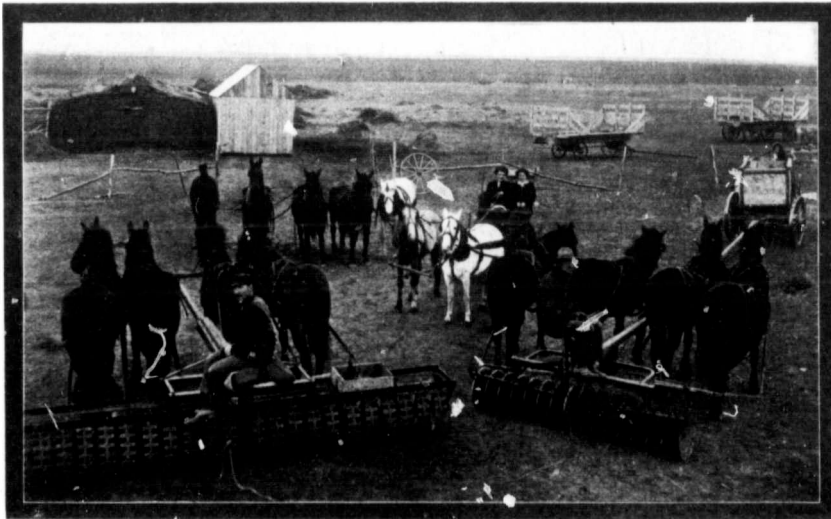
Almost all kinds of soil if worked in the proper condition can be harrowed as soon as plowed more effectively than at any other time. Some farmers make it a rule to do this, though it necessitates extra teams or else a change of teams each working

own distinct uses, and on most grounds a combination of several kinds would be a distinct advantage did it not necessitate driving over the ground so many times. A good tractor will pull a number of these different harrows after it at the same time it plows the ground, and may be rigged to be the most effective of clod crushers with its own weight.

One objection to the thorough harrowing a field should really have is the trampling of the fresh plowed earth by the horses' feet. The tractor can be rigged to plow, harrow and seed all in one operation; or, if more harrowing is desired, the broad wheels do not throw nearly as much weight on one portion of the ground as the horse does and the rolling contact is less objectionable. If they are run twice over the field

team power are from four to six inches deep, though perhaps their owners would be astonished to see their own furrows measured. The depth of a furrow is very deceptive to the eye. Eight to ten inches is the usual depth for tractor plowing on old land though a greater depth can be used if desired. This greater depth is of special benefit on those farms which have been plowed for years on the system of surface skinning until a hard, polished bottom of compressed soil has been established by the bottom of the plow, that cuts the roots of the plant off from nourishment below. By plowing a couple of inches deeper for a few years, and then increasing the depths again, the depth of the seed bed can be gradually increased without bringing to the surface an excessive amount of hard-pan at any one time. The tractor can turn this extra depth without torture and with astonishing uniformity. The thorough harrowing it can give while the earth is fresh will so completely pulverize this hard-pan and mix it with the other soil that it will not have any injurious effect, while it will help in the work of air and moisture—gathering, and the seed bed will be deepened.

A horse cannot pull more than fifteen miles per day on an average, but a team must walk sixteen miles to plow two acres with a 12-inch furrow. The tractor will draw a gang of from two to twelve 14-inch plows two and a half or more miles per hour, and will keep it up all day, without stopping to rest at the end of the furrow; then, by changing men, will keep it up all night.



A few years ago the four horse team was considered the "neme of perfection" in farm power.

period from plow to harrow. The tractor can harrow as it plows. Once over and the work is finished no matter what weather changes may come up.

Farmers differ greatly in their belief as to which is the best kind of harrow to use even for the same purpose and upon the same land, while many fields differ in patches in character of ground. The fact is, every harrow has its

thoroughness of the harrowing that can be done with them in the two operations would exceed perhaps a dozen times what could be done with horses, since several different kinds of harrows could be hauled at a time and supplemented one another.

The plowing can be deeper than is done with teams, and can be regulated more uniformly. A good many fields plowed by



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