

Conserving Soil Fertility

How proper methods of soil control can greatly improve the yield of crops

By Seager Wheeler

In presenting this article to the readers of The Guide, I am doing so after serious consideration for some time past. One of the reasons why I have not done this sooner is partly because I do not wish to force my methods on the attention of those engaged in agriculture, and because the method is somewhat new and out of line with those in practice at the present time.

I am aware that there are some who will not agree with me in these principles and methods on the grounds that they will not apply to every district. At the same time I am confident that the methods that I shall lay down, if followed as closely as possible, will lead to a better system of tillage and consequently a more satisfactory return each season than is obtained at the present time.

This article will not deal with the soil from a scientific point of view with respect to the formation and all the essential constituents of the soil, but with the more practical part that can be followed and can be worked out every day on the farm. The science of the soil may be left to those who are willing to study it, and there are many good books and publications at the present time that may be read and studied with profit. Every tiller of the soil should know something about the make up of the soil and its requirements. The tillage operations that I shall outline here are simple and direct in effect and apply to our western conditions, and I want every reader to note them carefully and impress the principles on their memory. While I shall emphasize on certain lines of operation, these may be followed as closely as possible to agree with the conditions that may apply to each district. There is no hard and fast rule that may be laid down to suit every condition, and I have carefully considered each and every point and am suggesting nothing that can not be applied with good results in practically every district. I wish to point out that the following is the outcome of many years close observation and experience in the field under all the many varying conditions of each season, coupled with some of the sound principles laid down by competent authorities on the soil, and I am presenting them with this object in view to set my reader thinking seriously of the possible solution of the problems confronting every farmer. As the title of this paper reads, conserving the soil fertility, it will deal with the fertility, how much of it is lost each season, how these losses may be prevented, and how to restore some of the fertility. It will deal in part with the root and seed bed, showing the difference between the two. Each has its place and must be properly understood, and while I have already described some of the operations in seeding, the summer-fallow and other tillage operations in former issues of The Guide, I shall emphasize on some of the most important points, as the time is now at hand when seeding will soon be in full swing. In dealing with fertility of the soil I shall have reference only to the humus, as this is one of the principal constituents. Without a proper supply of humus one cannot expect good crops. Humus is the home of soil bacteria that are essential in building up plant food. Many fields are depleted of humus and the cause of many light yields, partly due to

For the purpose of assisting Seager Wheeler with his correspondence, The Guide has made arrangements to have all enquiries concerning the treatment of the soil or the seed forwarded to him from this office. Enquiries or criticisms of these articles will be welcomed. All questions of general interest will be forwarded to Seager Wheeler, and his replies will be published in The Guide. By this arrangement, not only will Mr. Wheeler be saved the work of repeatedly giving the same advice to different enquirers, but the readers of The Guide will have the opportunity of getting advice from a practical farmer on any problem they may encounter in their field work. All enquirers desiring advice from Seager Wheeler, should address their letters to Seager Wheeler, c/o Grain Growers' Guide, Winnipeg, Man.

the fact that the humus is worked out of the soil by indifferent and careless handling of the soil. Humus is indispensable; it is the organic or vegetable matter, and we are somewhat responsible for the amount available. The depletion of the organic matter leads to impoverishment of the soil, and when this takes place it must be restored if we expect to obtain satisfactory returns.

Factors Causing Loss of Humus

One of the chief losses of humus is by the run-off

levels, or from off the field altogether into the waste places. These very fine particles are the richest and most valuable part of the soil, and every time it is carried away it is depleting the field of plant food. What appears to be fine soil grains is really organic matter or humus, and the choicest part of the soil that is necessary to feed the crop. Examine the soil when it is dry under a microscope, and it will be noted that it is chiefly organic matter—decayed vegetation. It is more easily carried away by the melting snow than are the soil grains proper. This waste goes on from season to season. The conservation of the rainfall thruout the summer is considered and emphasized upon, while much of the waste is allowed to go on for want of some attention. In many instances the summer-fallow is done too late in the season, and opportunity to catch the rains is lost. Only a single plowing is done, and at that time the moisture has evaporated from the stubble field and it is difficult to plow, and it is done when the soil is out of condition to plow; when a shallow cultivation ought to have been given, either in the previous fall or early spring, by the use of a good cultivator, disc harrow or shallow plowing. This would create a mulch to check evaporation and keep the soil in condition to plow and make plowing easier. If a summer fallow is worth doing at all it is surely worth doing well. One can afford to go

deeper in plowing a summer-fallow to prepare a reservoir to hold all the moisture that falls. Care should be taken to prevent weeds getting up too high, as they pump out moisture at a great rate, besides robbing the soil of the fertility. To do the best work weeds should not be allowed to get firmly established in the fields. The use of a good cultivator if used in good time will prevent this. These are some of the losses on the summer-fallow of the humus and the snow water. I am firmly convinced that there is more virtue in snow water than there is in rain water. If we were to take a pan of snow that had freshly fallen and where there was no possibility of it being contaminated by drifting soil and were to melt it, we would find some impurities in it. This is carried down with the snow from the atmosphere and it is rich in fertilizing elements. If it falls on the soil and is prevented from running off in the spring more fertility is added to the soil.

Before I go on to describe a simple method whereby we may prevent this loss or waste I shall refer to another waste of humus that is going on each season, namely, by drifting of the soil, chiefly in the spring before the crop is advanced sufficiently to check it. Under our western conditions where the prevailing high winds in the spring, especially during the month of May, not only evaporate considerable moisture but carry away more into the atmosphere, into the lower parts of the field, into the wayside, the fences, where may be seen banks of drifted soil which enrich the weeds and grasses, we will find that it is not only the soil grains proper but also valuable humus. In many fields nearly, or all, the top soil has blown away, leaving only the bare subsoil. While these losses occur in some districts more than others, it is mainly due to a lack of fibre that is essential to bind the soil grains together. Burning of the stubble

Continued on Page 22

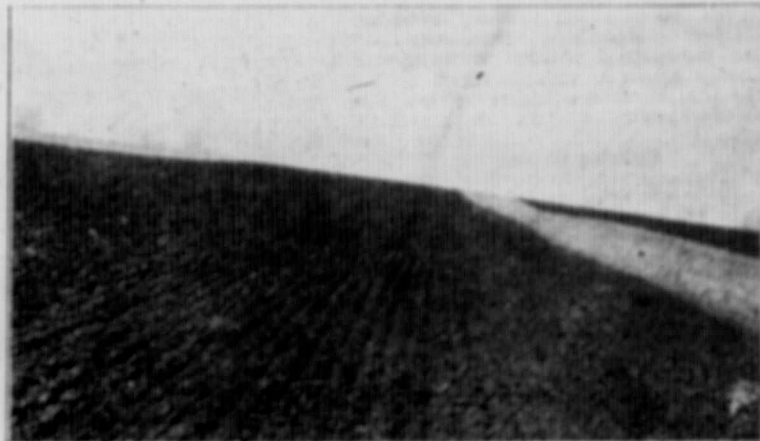


Shows corrugated condition of summerfallow as it should be left to go into the winter

of heavy rains and melting snow in the spring. The object in view when preparing a summer fallow is to conserve moisture and keep weeds in check. The chief object is to conserve moisture by plowing early in the rainy season to catch and hold all the rains that fall in the summertime, but no thought is given to conserve the snow that falls during the winter-time. This is allowed to run off the fields in the spring and little or no attempt is made to check this waste and hold it in the soil. Except on specially favored fields that lie completely flat, considerable of the snow water runs to waste. It runs off to the lower levels, into the sloughs, ravines, the pot holes in the field or roadside. This occurs especially on the summer fallow, prepared fall plowing, and to some extent from the stubble fields. Apart from the loss of the valuable snow water, it carries away with it the finer particles of soil, principally the humus, from the higher to the lower



Showing the fine effect on the furrow slice by the use of the packer attachment to the plow. This is done in one operation.



Land left after the plow has turned it up and the packer has passed over it. There is very little loss of moisture by this method.