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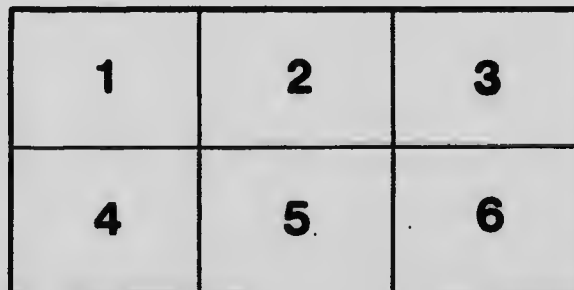
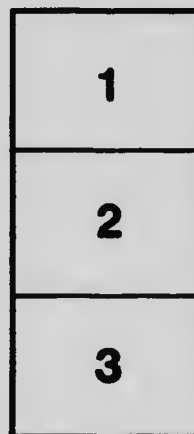
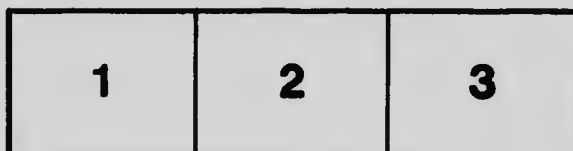
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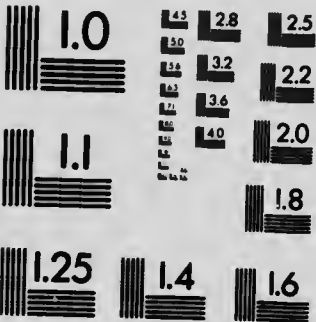
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The Summerfallow

... IN ...

Southern Alberta

By JAMES MURRAY
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ISSUED BY DIRECTION OF
HON. GEORGE HOADLEY
MINISTER OF AGRICULTURE

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The Summerfallow in Southern Alberta

With an average annual rainfall varying in different districts from twelve to eighteen inches, Southern Alberta forms part of the great plains region east of the Rocky Mountains that is classified as semi-arid. In occasional years only is there sufficient rainfall in a season to produce a full crop of grain unless there is a reserve of moisture stored in the soil from the previous year. The method of cultivation followed to store up this reserve is known as summerfallowing.

Much of the success that has attended the growing of grain in Southern Alberta during the past fifteen years is due to the extensive practise of good summerfallow methods, while many failures are accounted for by a neglect of the best known practises of cultivation. The experience of the last four years has shown that even the best summerfallow will not produce a good crop every year when a number of seasons of very light rainfall succeed one another, but they have shown equally clearly that on good land an absolute failure is rare when good cultural methods are consistently followed.

THE OBJECT OF SUMMERFALLOWING.

The main object of summerfallowing under Southern Alberta conditions is to store moisture from one season to help grow a crop the following season. Incidentally, when careful methods are followed, the land is cleared of weeds and a supply of plant food liberated. The building up of the moisture reserve is so much more important here than the other objects of summerfallowing that it should always be kept to the fore.

WHY MOISTURE IS NECESSARY.

Plants, it should be remembered, take all their nourishment in liquid form; they drink all their food. Incidentally they take it in a very diluted solution so that enormous amounts of water are needed—from 400 to 1,000 pounds for each pound of dry matter produced. No matter how rich a soil may be, if there is not water enough present to furnish the plant with the nutrient solution in sufficient quantity, the soil is comparatively unproductive. On a fertile soil the solution is more concentrated and a limited amount of moisture will go further toward producing a crop than on a poor soil. This accounts for the big yields that are often harvested from the rich soils that are characteristic of semi-arid regions. Cultivation which helps to make plant food more easily soluble helps toward the production of a crop.

To get the necessary moisture the roots of grain crops will penetrate the soil for six or eight inches, and often much further. But they will go only as deep as the moisture extends. They will not penetrate dry soil

in the hope of reaching moisture farther on, so that a few inches of dry soil a foot from the surface is an effective barrier against a deep root system. In a good summerfallow the moist soil extends from a few inches below the surface to three, four or five feet. Such a store of moisture provides the best of conditions for the roots to have a deep feeding ground.

SOILS THAT ARE BENEFITTED BY SUMMERFALLOWING

In soils of a sandy or gravelly nature it is impossible to store much moisture, and little should be expected from a summerfallow on such land. Neither will those underlain near the surface with shale or other impervious matter be benefitted to any great extent, but all others, particularly those with heavy subsoils, will hold moisture from one season to the next and can be summerfallowed to advantage.

FREQUENCY OF SUMMERFALLOWING.

In the districts with the lowest rainfall the safest practise is to summerfallow practically half of the cultivated land each year. Where the rainfall is heavier it is frequently possible to get two good crops in average seasons, but with our present system of farming not less than one third of the dry land farm should be in summerfallowing each year.

WHEN TO START SUMMERFALLOWING.

As far as the storage of moisture is concerned there is no better time to start summerfallow cultivation than when the crop is removed. Discing after the binder destroys weeds, covers weed seeds and shattered grain, and mulches the soil. Where there is horse and man power available it is good practise. Discing late in the fall after the crop is threshed is often possible when it cannot be done after the binder. At this season of the year horses are usually in good condition and the work can be done cheaply. With the early discing, if there is moisture near the surface, grain and weed seeds will germinate, and the plants will be killed in the winter. The late discing will only cover the grain and weed seeds and insure germination in the spring.

The objections to fall discing are that the stubble is broken down and does not hold snow as well during the winter, and in some cases considerable good feed is covered and lost. Where there is much discing to do, it is usually good practise to get some of it out of the way in the fall as it can usually be done more cheaply than in the spring.

SPRING CULTIVATION.

Any land to be summerfallowed that has not been disced in the fall should be thoroughly worked up as early in the spring as it is in condition. It is necessary to stir only enough soil to cover all weed seeds and grain and to kill the millions of small Russian Thistles that start almost as soon as the snow goes. Particularly in districts where Russian Thistle is prevalent,—and that includes most of Southern Alberta,—the cultivation before plowing is of great importance. If the thistles are allowed to grow undisturbed until the first or middle of June they have, in an ordinary season, pumped most of the moisture from the top foot of soil. They have not only used up the water that the summerfallow is designed to save, but they have left the land so dry and hard that it cannot be well

plowed. To efficiently control the weed growth in the spring and early summer it may be necessary to double disc or cultivate the land twice. The time and expense that this involves is not lost as the weeds have to be killed but once, and less cultivation is necessary after plowing if most of the weeds are destroyed early. There is a distinct saving too in the energy needed in plowing as the killing of the weeds while small, leaves the moisture in the soil and the plow not only better, but with less power.

If the growth of weeds is not checked the season during which good plowing can be done is very short. The land becomes hard and dry and either turns up in big chunks, or is scratched two or three inches deep. Either type of work is next to useless, and accounts in no small measure for the poor returns from summerfallowed land.

TIME OF PLOWING.

If the growth of weeds has been controlled by discing or cultivating the necessity for very early plowing is removed. Naturally the sooner the expensive operation of plowing can be done the better, as the hot weather of late June and July is not a suitable time for such heavy work, but with moist soil to plow and good work thus assured there is no particular harm done if it is not completed until comparatively late.

In certain types of soil it is impossible to do good plowing with mold-board plows when moisture has been conserved in them by cultivation. In such cases it is much better policy to use disc plows than to wait for the land to dry out enough to use the ordinary plow.

DEPTH OF PLOWING.

Very deep plowing has frequently been urged as a pre-requisite of a good summerfallow, both to provide room for extensive root development and to insure an ample reservoir for water. The root system of our grain crops as already pointed out, depends more on the depth of moisture in the soil, than on anything else, and under favourable conditions extends to a depth of three or four feet. Excessively deep plowing is not necessary, therefore, to insure room for roots. The reservoir for moisture is fortunately much deeper than one plow furrow, as a good summerfallow is moist from three to five feet from the surface. In deciding how deep to plow, the aim should be to plow deep enough to do thoroughly good work and to go a little deeper at each successive plowing until a depth of about seven inches is reached. Deeper plowing seldom pays for the additional cost unless it be where it is necessary to break up a more or less impervious hard pan.

CULTIVATING AFTER PLOWING.

When turned over by the plow the soil is loose and open, and if left without cultivation the air mixed with and circulating through the furrow soil is likely to dry out. The main object of packing is to prevent drying out by the movement of air through the newly turned furrow. The drag harrow is largely used as a packer and is an effective tool, but it has the objection of fining the surface soil more than is desirable. The sub-surface packer will do the work better and have the surface in a safer condition. Those who have not a packer can use a disc well weighted and run practically straight. A tandem disc—an in-throw and an out-throw in the

one frame—is more effective than the ordinary disc, but the latter will answer the purpose where nothing else is available. To be most effective the packer should follow the plow closely.

The amount of cultivation necessary during the balance of the season will depend upon the weed growth and the number of heavy rains. If the annual weeds have been controlled before plowing and the seeds all germinated they will give little more trouble, but perennials may need attention. Heavy rains may result in a heavy crust forming, and this should be broken up.

When cultivation is necessary it should be given with tools that do not pulverize the surface as the object should be to keep a granular or even a clod mulch on the surface. The duckfoot cultivator, the rod weeder and the spring tooth harrow are safe tools to use, while the disc and the drag harrow should be avoided on account of their pulverizing action. The amount of cultivation necessary after plowing will be much reduced if the spring and early summer work has been thorough and timely.

In districts where the Pale Western Cutworm is troublesome an effort should be made to keep off the summerfallow during the last week of July and the month of August. It is during this period that the cutworm moth lays its eggs and it prefers freshly stirred soil as a place to deposit them. If a light crust covers the land at that time the number of eggs laid is likely to be greatly reduced and damage from cutworms the following year minimized.

LATE FALL CULTIVATION.

On account of danger of drifting the surface should be left as rough as possible in the fall. The duckfoot cultivator or the spring tooth harrow with teeth a foot apart may be used to ridge the land at right angles to the prevailing winds. The ridges retard the action of the wind and also catch considerable snow that would drift off a smooth surface. If this ridging is done when the surface is wet it is much more effective.

OBJECTIONS TO SUMMERFALLOWS.

The chief objection urged against the bare summerfallow in Southern Alberta is that it promotes soil drifting by working the fibre out of the soil and leaving a full surface exposed to the action of the wind. Soil drifting has become a real problem in some districts and is difficult to combat. The danger can be reduced by keeping a rough granular or cloddy surface instead of a finely pulverized one, and by ridging the surface as above outlined. It can be helped too by not having large areas in a block in summerfallow, as most of the damage is on bare fields of considerable size. The method of working the farm in strips fifteen or twenty rods wide with alternate strips in fallow and in stubble is being used with good promise of success in some districts. It has not yet been practised long enough to speak definitely regarding it. The method is open to serious objections, but it has such distinct advantages where drifting is a menace that it is worthy of a trial.

The only real cure for drifting is to put back into the soil some of the fibre that years of cropping and summerfallowing have removed. Brome grass and Western Rye grass will do this better than any other crops now available and information is accumulating year by year as to how they can best be used.

SUBSTITUTES FOR SUMMERFALLOWING.

As a substitute for part of the bare summerfallow corn for fodder and for grain has distinct possibilities in many districts,—particularly at a distance from the mountains. Sown thinly in rows or hills three or three and a half feet apart and kept well cultivated it acts as a cleaning crop, and furnishes much valuable feed. The stubble helps protect against drifting and the land can be prepared for a grain crop without plowing. Where corn does not thrive sunflowers may be used in the same way.

Oats sown in double or triple rows thirty inches apart and cultivated like corn have been giving promising returns in a few districts where it has been tried. The light stand of oats takes some moisture, but this is at least partly compensated for by the stubble holding the snow and acting as a protection against drifting.

Any substitutes that may be used will come into use slowly as experience proves their usefulness. In the meantime the good summerfallow has over many years shown its value as the safest method of preparing land for cropping, and while it has its weaknesses it can not be dispensed with until other methods have been proven more reliable.



