

useful implements on the farm. No plowing, unless under special conditions, should be done in the West without this equipment. Its value cannot be overestimated under our condition of light rainfall and especially in plowing in the spring. There are several kinds of small packers on the market, some are sub-surface and others surface packers, beside harrow attachments. I can recommend the packers as an improvement over the harrows. They are not expensive and will more than repay for the outlay in one season.

Pack the Plowing

After the plowing is done a larger packer, preferably a sub-surface packer, should be used to firm down the furrow slice. This is followed by the plank drag as shown in the cut. The effect which it has in levelling the surface of the soil should be noted. After this is done the harrows should be used to restore the mulch. The land can now be left for other work to be done on the farm. If the land is weedy it will not be long before weeds are showing up. This operation of handling the weeds and volunteer grain is usually left too long until the weeds and grain are firmly established and this makes it a more difficult task to destroy them. Weeds or grain should not be allowed to get firmly rooted. If they are handled just as they are showing thru the ground the harrow is the most efficient tool to use, as it covers a large area in a short time. If the weeds are watched carefully and not allowed to get a footing, the harrow will destroy them. But this operation must be attended to and no other work should be allowed to interfere. The cultivation given by the harrow aerates and ventilates the soil and is continually creating plant food.

The general advice given is to harrow after every rain, but this is not necessary. If a rain falls and is not heavy enough to run the soil particles together under our conditions the sun and winds that follow a rain will restore the mulch. The time to harrow after a rain is when a heavy thunder shower or continual rain thoroughly soaks or lies on the soil as after a sudden downpour. It will then be necessary to harrow again to restore the mulch and conserve the rain that fell.

Use a Cultivator

Once during the season after a heavy rain, as soon as the soil is dry enough to work, I can recommend a pointed tooth cultivator as an efficient and necessary tool to use. By not allowing it to go too deep this will put the soil in splendid tilth and it is not necessary to follow with the harrow unless weeds are very thick. I have given the foregoing as a necessary operation to destroy weeds, but the cultivation given in doing so is of great value apart from the control of weeds and is necessary as it is a means of producing or creating fresh plant food by aeration and cultivation. Land that is left in a cultivated condition will absorb all the rain that falls and moisture will enter more easily into the soil to be conserved by harrowing afterwards.

There is one operation that I consider

ly. Thus the seeder will not penetrate the soil easily.

By using the pointed tooth cultivator before freeze up, letting it run lightly over the ground it forms small furrows and ridges, so that the melting snow, instead of running off, will penetrate into the root bed and deeper soil, making a reserve for the crop to draw on in a dry season.

This last cultivation should be left untouched again by harrowing. The object is to have the soil in small ridges and furrows to allow all the water from the melting snow to penetrate into the root bed and not be allowed to run off. If there is any slope to the land this cultivation should be made across the slope. The ridges and furrows made by the harrows are not deep enough. Besides holding all the water the harrowing that ought to be given before seeding

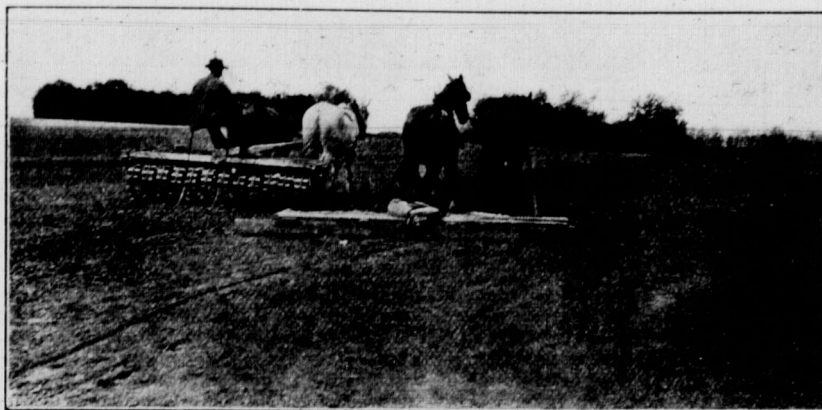
or clean. The soil will be firm below and the ridges when pulled down will form an ideal mulch.

Beside conserving all the moisture the cultivation will destroy many small weeds and ventilate the soil. In the spring again it answers the same purpose. I use a hoe drill with long cultivator points to do this kind of cultivation, but any similar tool will do the same work.

Ideal Soil Condition

If these methods are followed the soil should be in prime condition and tilth for wheat in the spring. An ideal condition of the soil in the spring when ready to seed is when the earth will mould in a lump by a single compression by squeezing it in the palm of the hand, and will fall away again loosely so that the soil separates into fine particles when the lump is subjected to slight pressure between the thumb and fingers. It should not be too wet, but moist and pliable. In conclusion it may be well to summarize the above. To have a good summerfallow—that is, land ready for crop which will not fail to give a profitable yield—the land should be shallow plowed or disced beforehand, preferably in the previous fall. If not then at least as early in spring as possible, either before or immediately after seeding is done. The shallow plowing method is preferred. Next, the land must be plowed deeply as early in June as possible, turning up at least one inch of new soil. Have a packer attachment to the plow. Use a plow that turns the furrow right over. The turn of the furrow is important and should be considered even before particularly straight furrows. The soil should be moist when plowed and not plowed when very dry. The soil will not be dry even in a very dry spell if the ground has been prepared beforehand. The soil should be moist enough so that the furrow rolls over and pulverizes in turning. Follow with a sub-surface packer if one is at hand, or else with a surface packer. Then plank drag and follow with the harrow. Cultivate thruout the season so that no weeds get a start. Don't omit to cultivate with the harrow point cultivator and leave it once in that condition if possible until a heavy rain falls to catch the

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Plank drag follows packer after plow. Followed immediately with harrows to restore mulch.

of great importance that should be done at the end of the season before the ground freezes. The general rule is to leave the summerfallow level or as the harrows leave the soil. This land goes into the winter in this condition and when the snow thaws off in the spring much water is lost or run off and the soil is left compacted thru the soil particles running together, so that when the harrows go on the land in the spring they simply scratch the soil and do not stir it sufficient-

may be done across the ridges and they will pull down in fine shape. The soil will then be in splendid condition and the seeder will deposit the seed easily at the required depth.

Now it must be understood that this harrowing will not make the seed bed too loose, as the soil below the ridge will be firm and compact, as it should be for wheat. The value of this operation cannot be overestimated and ought to be done whether the land is weedy

Cow Testing

By J. W. Mitchell

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"Homestead Patsy Colantha 4th," Sire "Grace Fayne 2nd Sir Colantha," Owned by the Manitoba Agricultural College

No farmer will find any branch of his farming operations as profitable as it should be, even tho the market be satisfactory, unless he produces economically; and production is never economical unless the yield is sufficiently large. Neither the production of ten bushels of wheat to the acre, nor the keeping of a cow that produces 3,000 pounds of average milk, or a little over a hundred pounds of fat, per year, will prove profitable; but double the production in either case and the result will prove reasonably satisfactory, provided the quality, of product, too, is what it should be.

It is not claimed that the keeping of a good dairy cow is enough in itself to insure the economical production of milk and butterfat, as proper care and feeding must accompany this and are quite as important as it is, but it is none the less a fact that a good dairy cow is indispensable to success.

Given right conditions as to care and feeding, a reasonably good dairy cow will produce 6,000 pounds of average milk or its equivalent of richer milk, or 215 to 230 pounds of butterfat a year. This is not at all a high standard to set, and there are, in fact, dairy farmers in the West who have already passed this point considerably.

How are we to ascertain a cow's value for dairy purposes? Certainly not thru guessing at what she is doing, and it may be added here that it is equally as great a mistake to average the herd.

No Added Labor

One essential to success, in the building up of a dairy herd, is to weigh, sample and test the milk of each cow in the herd thruout her milking period, or to carry on what is known as cow-testing work. This enables us to weed, breed and feed intelligently; and the beauty of it is that it does not entail any great amount of extra labor, but, on the contrary, actually saves labor and greatly enhances our profits, thru enabling us to keep only cows that will bring large returns for the labor expended and the food fed them.

Over five years ago the dairy department of the Manitoba Agricultural College outlined a simple method of carrying on cow-testing work and made a liberal offer of co-operating with the farmers of Manitoba in the testing of their cows. The work has been carried on continuously since its inception and many farmers have, from year to year, taken advantage of the offer made.

Briefly stated, cow-testing, as usually carried on, consists of weighing the milk

of each cow in the herd morning and evening of each of three days in the month, ten days apart, during each month of their milking period, recording the weights on a suitable report form, taking a small sample of her milk at each weighing and putting it into the bottle set apart for this particular cow, and sending in the samples, accompanied by the report form, at the end of the month to be tested. This constitutes the whole of the work to be done by the farmer. The College supplies the weighing and sampling outfit, does the testing of the samples and completes the filling out of the report form, all free of charge.

The Sampling Outfit

The free outfit consists of the following:

- 1—Report forms and instructions for weighing and sampling.
- 2—Spring balance for weighing the milk.
- 3—Case of sample bottles—a bottle for each cow in the herd.
- 4—Small sampling dipper.

To insure the return of the outfit, when the farmer is thru with it, a deposit of \$1.50 is asked, which deposit is refunded when the outfit is returned to the College. When the report form for each month is filled out, it is sent to the farmer to place on file and this enables him to total up, at the end of the year, the quantities of milk and butterfat produced by each cow in his herd.

One point that is insisted upon is that a farmer, before beginning the work, will agree to carry it on thruout the year. It is of little value to engage in the work

for a month or two and then discontinue it, as the results may be most misleading, since some cows give a large flow of milk for a short time but go dry early, while others which do not give so much milk at any one time are much more persistent milkers, and again, the per centage of fat in one cow's milk may increase at a much greater rate as she advances in her lactation period than is the case with another in the same herd under the same conditions as to care and feeding.

Cow-Testing Associations

Creameries are now quite general thruout Manitoba and the Agricultural College authorities would greatly like to see the patrons of these creameries form themselves into Cow-Testing Associations, in which case the dairy department could arrange to have the testing of the samples done at the creameries and so avoid to the farmers the cost of transportation of the samples to the College. Furthermore, such an association would prove of great educational value to the patrons of a creamery.

Without doubt, thru a reasonable weeding out and building up of our dairy herds, and intelligent care and feeding, the output of milk and butterfat for the province could easily be doubled, and the profits of the farmers quadrupled without any increase in the number of cows. This is quite evident from the large amount of cow-testing work the dairy department has already done.

For further information regarding this branch of the work, write the Dairy Department, Manitoba Agricultural College, Winnipeg, for Bulletin No. 8, "Cow-Testing."