

### Cultural Implements

Next to the disc harrow which has taken a permanent place in the list of farm tools and without which a farmer can make good, is the acme harrow. This tool, now pretty thoroughly known wherever scientific methods have been introduced is a steel harrow equipped with a special type of coulters with a double twist with which it throws the soil to the right and the left, giving it a complete turn. As a light surface cultivator and weeder the acme is a great success, cutting off the weeds and leaving a well-pulverized mulch on the surface. The acme is also used in the preparation of the seed-bed following the turning of sod ground. One correspondent states that he has used the acme on sod ground exclusively for the last two years. He says: "We first break the sod from four to five inches deep, pulling a packer behind the plow and an acme harrow behind the roller and an iron harrow behind the acme. We aim to get two inches of mulch. If the tools are not heavy enough we weigh them down until they work the soil to suit us. This work is done all at a time as we use traction power for nearly all of our work. On fall breaking the soil is left in this way until spring when we harrow it angling with a light harrow so as not to turn up the sods. We use a disk drill and place on all the press we can get. We harrow again after the drills. I formerly used the rolling disk harrow after the plow, but quit them for the acme because they turned up too much sod and made the ground hard to work down to fill all air spaces."

### Harrowing Grain

So much advice has been given on this subject that the average farmer begins to distrust his own

judgment. Shall we harrow our wheat or our flax or our oats and when, are the questions that come almost daily. Harrowing grain is the most every other farm process or should be governed by conditions.

Here is what the North Dakota experiment station has to say on the subject:

"Grain may be harrowed to good advantage after it is four to six inches high, providing the soil is firm, the harrow light and the day warm, dry and the sun shining brightly. Wheat and oats may be harrowed to good advantage just before they come up. If barley or flax are harrowed at any time after they are up, great injury to the crop will result. Wheat and oats are the small grain crops that can be harrowed to best advantage, but great injury may result if the ground is harrowed during cold, damp weather, when the dew is on the young plants when they are less than four inches high, when the soil is loose, when too heavy a harrow is used or when a heavy, dashing rain falls within twenty-four hours after the harrowing is done. Experience on the demonstration farms indicates that the best time to harrow is just when it is beginning to germinate, which is usually a week or ten days after seeding. There is no implement as good as the harrow for exterminating annual weeds which start from small seeds, such as buckwheat, pig weed, French weed, mustard, etc. The harrow is useful in the early spring in getting the weeds to start and in warming up the soil while later applications of the harrow will, if used judiciously, go a long way towards exterminating

very commonsense advice, which the farmers (particularly of his own province) should not lightly turn aside.

"The control of the yield of crops on our stubble fields," says Mr. Bracken, "is without doubt the most pressing problem in

tion that makes it advisable to leave grassy stubble unplowed.

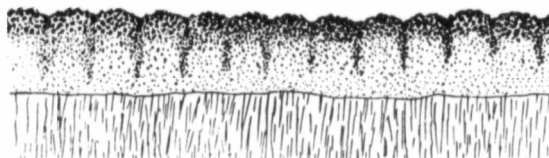
It was observed that in all cases where the yield was increased and the grass was either totally killed or very much lessened. When the same land was left unplowed, in many instances it became overrun with native quack or, in low places, with sweet grass and the cost of redeeming it was thus much increased.

Cereal crops cannot compete successfully for moisture and plant food with established perennial plants. Neither burning nor surface cultivation will kill the latter, and when they are present in any quantity in stubble fields, plowing for the succeeding crop, either in fall or spring, becomes almost a necessity.

### Burning Stubble

Burning stubble is permanently wasteful, but immediately profitable.

The average yield during three years for all stubble land that was



Plowed Field after Sub-packing.

production now facing the Saskatchewan grain grower, and in view of the fact that over two-thirds of our cropped area is stubble, it would seem that this portion of our farms should receive very much greater consideration than has ever been given them.

The causes of low yields, he points out, are:



The Harrow behind the Plow saves tons of moisture.

1. Low moisture content of the soil.
2. The presence of grass, shrubs and weeds.
3. A poor seed bed.
4. Insufficient "soluble" plant food.
5. The stubble itself.
6. Unavailable subsoil moisture.

The first of these is the most general, but any one or all of the others may be contributing factors. Some cannot be controlled absolutely, but all of them can be materially influenced by the farmer, and most are entirely within his control.

### Some Good Tillage Practices

As the result of careful experiments carried out on the University farm from 1911 to 1914 seasons (inclusive), Mr. Bracken and his colleagues recommend:

The necessity of plowing "grassy" stubble.

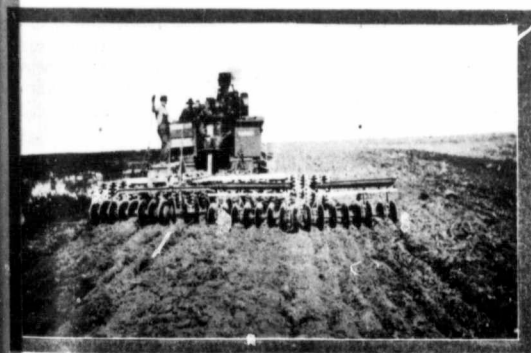
The average yield of wheat for three years on untilled grassy stubble was 5 bushels, 25 pounds less than on untilled stubble that was free from grass. There are times when it may not be best to plow clean stubble fields, but there is seldom a time or condi-

surface cultivated in any way was 15 bushels and 50 pounds of wheat, while the average for the same length of time for land that was burned and then surface cultivated was 16 bushels and 33 pounds per acre.

A very much greater increase from burning has been reported from the Qu'Appelle Valley and Regina Plains, where the soil is heavier and where the stubble grows longer and holds more snow. It would seem that on heavy rich soils, where the straw grows tall, burning in the spring after the long stubble has been left to gather snow, is a practice that, for immediate profits, is conducive to large net returns.

On the other hand, this method does not give opportunity for controlling the spread of annual and biennial weeds. In regions where spring burning has been followed for any length of time, these are very abundant. In some older districts where weeds are abundant, and where the fallow blows so badly that the drifting soil covers stubble fields and renders spring burning impracticable, fall burning and surface cultivation is

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into a perfect seed for any Crop that can be sown.

annual weeds."

### Tillage of Stubble Land

In a recent article on this subject by John Bracken, Professor of Field Husbandry, University of Saskatchewan, offers some