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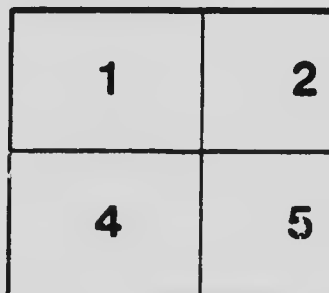
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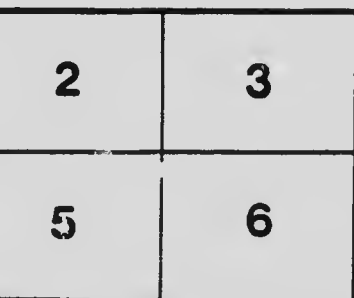
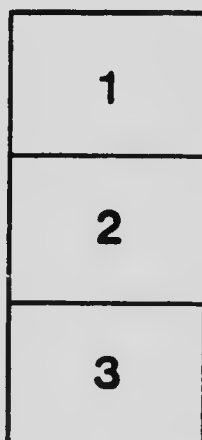
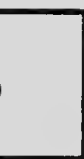
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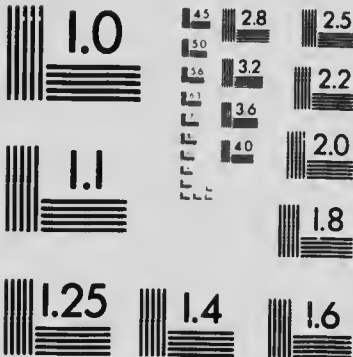
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# Cultivation After Harvest for Weed Control

BY T. J. HARRISON, B.S.A., Professor of Field Husbandry



WILD OATS (*Avena fatua*.)

Manitoba Agricultural College — Winnipeg

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## Cultivation After Harvest for Weed Control

The biggest problem the farmer has to solve in Manitoba to-day is the control of noxious weeds. While it is believed that more live stock, especially sheep, and well arranged system of crop rotation is the only permanent solution of this problem it is apparent to a careful observer that the average farmer cannot stock up his farm or lessen the amount of land sown to wheat at once, because of his financial condition. It, therefore, becomes necessary to use every other method of weed control at his disposal. While weeds make their greatest growth and are most effectively controlled during the month of June and the first part of July, there is considerable work that can be done in the fall which will give very beneficial results the following season.

### CLASSES OF WEEDS

If the fall cultivation for weeds is to be both effective and successful from an economic standpoint, it is necessary to understand their habits of growth. For practical purposes the weeds may be divided into four classes:—

(1) *Annuals*—These grow from the seed in the spring, produce seed the same season and then die. Wild oats, wild mustard and Russian thistle are among the worst weeds belonging to this class.

(2) *Winter Annuals*—These weeds start from the seed in the late summer or early fall, make considerable growth that autumn, remain green during the winter, renew their growth the following spring and produce seed before the annual grain crops are harvested. Stink Weed and many of the *Chenopods* belong to this class.

(3) *Biennials*—Plants of this class start from seed in the spring, make only a small top growth during the first season, but develop a big fleshy root from which growth starts the following spring. They produce seed the second season and the whole plant dies. In the West there are not many weeds belonging to this class that give much trouble, the Burdock being the most common.

(4) *Perennials*—The weeds belonging to this class have roots which never die, but continue to grow year after year and spread by sending out under-ground running roots. They also spread from seed which is produced each season. These are the worst weeds the farmer has to contend with; for to this class belong the perennial sow thistle, Canada thistle and couch grass. With the nature of the different weeds in mind the field cultivator should be so arranged that it will be most effective on those that it is intended to kill.

### WILD OATS AND OTHER ANNUAL WEEDS

With weeds of this nature the object should be to have seed germinate and then kill the plant while it is small. Though it may not be possible to get all the wild oats to germinate in the fall, the cultivation of the stubble at this season of the year will start some which will be killed by the frost and still leave the soil in ideal condition to have a large percentage of the seed germinate early the following spring.

to digest sufficient food, which is stored in the roots, to continue the battle for two or three weeks longer. It, therefore, becomes necessary to keep the fallows black both summer and fall, being careful not to neglect the fall cultivation, as it is often the last time over the field that kills the strongest weeds.

#### Surface Cultivation of Stubble Land Intended for Summer-fallow—

Discing after the binder or skim plowing in the fall is of very little use with sow thistle, because the plant has stored up its supply of food during the summer and cutting it off at this time will not weaken it to any appreciable extent.

#### Deep Plowing of Stubble Land Intended for Summer-fallow—

Some farmers are obtaining good results from plowing the land and they intend to summer-fallow about four or six inches deep in the fall, leaving it loose and giving it only surface cultivation the following season with the duck foot cultivator. The effectiveness of this method depends on the soil being broken away from the roots in the fall where they are likely to be damaged to some extent at least by the frost. Then the soil is dry in the spring and they cannot begin to obtain food, so that they are in a weakened state when the cultivators start work and are more easily controlled. Where Canada thistle is the weed that is giving the trouble, plowing the land about six or seven inches deep just a day or two before freeze-up, often will completely eradicate these pests. The reason for this is that the running root of this thistle is about six or seven inches deep in the ground. If the plowing is done at this depth it turns this root up to the surface and the young shoots from which new plants start the following spring are killed by frosts.

#### SUMMARY

1.—Understand the habit of the weed and apply cultivation that will be most effective.

2.—For annual weeds, such as wild oats, surface cultivation in the fall, such as discing or skim plowing, will cause some of the weeds to germinate and they will be killed by the frost.

—With the winter annual weeds, such as stink weed, the same method will hold good, but a surface cultivation must be given in the fall or early spring for these weeds are not killed by the frost.

4.—The only method of effectively killing the perennial weeds, such as sow thistle, is by starving them out. This can be done to best advantage by surface cultivation with a duck-foot cultivator.

5.—If bad weeds are to be controlled the farmer must be persistent in season and out of season.

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is not very successful. The deep plowing causes the soil to dry out near the surface and no germination takes place until late the following season after which it is impossible to have all the seed germinate.

#### **Second Plowing of Summer-fallow—**

The plowing of the present year's summer-fallow the second time late in the fall is not good practice when the control of wild oats is the main point at issue. When the summer fallow has been plowed early in the season, packed, harrowed and cultivated to keep it black during the summer, there should be few ungerminated weed seeds left in the surface soil. If this land is plowed again the second time in the autumn that clean surface is turned down and a comparatively dirty one turned up. It is too late for all these seeds to germinate that fall and the result is they grow the following season in the crop.

#### **Surface Cultivation of the Fallows in the Fall—**

If wild oats are the only weeds present, fall cultivation will be of little use, for the frost will kill the late weeds as effectively as the cultivator and it will be much cheaper. The dead plants will also have a tendency to prevent the fallow from drifting.

#### **Fall and Spring Plowing—**

Where the land is to be cropped the following season the best results are obtained with wheat when the land is fall plowed from four to six inches deep early in the autumn and the soil packed and harrowed immediately after the plow. This will allow some growth to take place in the fall which will be killed by the frost. Where oats and barley are to be sown it is believed that skim plowing in the fall and deeper plowing the next spring will kill some wild oats.

### **STINK WEED AND OTHER WINTER ANNUALS**

Fall treatment that is effective for wild oats would also be useful for stink weed, because the object is the same—to germinate the seed and kill the plant while young. There is just this difference, however, the frost will not kill the latter weed, so that it requires a late fall or early spring cultivation.

### **SOW THISTLE AND OTHER PERENNIAL WEEDS**

Since this type of weed spreads by both seed and root, an entirely different method of cultivation must be adopted. Bare fallow is the method used by most people for cleaning the sow thistle out of the worst field on the farm. It is sometimes effective and other times it fails. This might be due to misunderstanding the nature of the plant. The leaf of this plant performs the same function as a stomach in an animal. If the stomach could be removed without injuring the body the animal would soon die of starvation. The same is true with the plant; if it can be prevented from forming green leaves it will starve to death.

#### **Fall Cultivation of Fallow—**

Cultivation of the summer-fallow in the late spring and summer keeps the leaves from appearing above ground and the starving-out process has started but when haying and harvesting begin the fallow is sometimes neglected and the sow thistle acquires leaves two or three inches long. The result is that it has had time

### Fall Discing—

While it is possible that discing late in the fall will not have as beneficial results as skim plowing, there is no doubt it would be very effective in starting many of the seeds, because the weather is warm and the soil has not lost much moisture by evaporation. The work should be done immediately after the binder, having one or two discs following in the spaces between the grain and the sheaves. If this method is adopted it is usually necessary, after the stooks have been removed, to re-disk or harrow along the rows where they have stood, in order to cover the seeds that have been scattered by the stook wagons. Discing after the binder has also the distinct advantage of putting the soil in a condition to receive and conserve all the moisture that falls during the autumn. The land is sometimes harrowed late in the fall, but for straight annual weeds, like wild oats, it is doubtful if the result from the harrowing would pay for the cost of the operation. Following the binder with the disc has one very serious objection, — that on the average farm it is almost impossible to find teams and men even to cut and stook the crop, let alone disk the land. It becomes necessary, therefore, for most farmers to adopt some other method of cultivation.

### Discing after Threshing—

Double discing the stubble land intended for fallow or spring plowing has given very fair results in many districts in the province. It starts a fair growth of weeds, but where it has been compared to skim plowing, it has not given nearly as good results.

### Skim Plowing—

Skim plowing is a term applied to plowing stubble land from two to three inches deep in the fall. Throughout the province this method has given exceptionally good results in the control of wild oats. Many fields infested with oats that were intended for summer fallow have been treated in this way and when the season has been favorable these pests were completely cleaned out. There are a few exceptions, however, that must be taken or the work may prove disappointing.

(1) The soil should not be plowed deeper than three inches; for if it is plowed too deep and left loose, the soil dries out to the bottom of the furrow slice and the seeds germinate.

(2) If best results are to be obtained the plow should be followed immediately with the surface packer. This will both conserve the moisture and by packing the soil closely around the seed, cause a quicker germination.

(3) To obtain the best results the plowing should be done early in the fall.

Where the above precautions have been observed the farmers are enthusiastic over the successful killing of wild oats and the moisture conserved. Some claim that the amount of moisture saved makes the plowing of the fallow much easier the next spring.

### Deep Plowing of Stubble Land Intended for Summer-fallow in the fall—

The plowing of stubble intended for summer-fallow in the fall and early surface cultivating the following season has its merits with some weeds, but for wild oats it



STINKWEED OR FIELD PENNYCRESS (*Thlaspi arvense.*)



