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CONTROL OF COUCH GRASS IN MANITOBA

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BRANDON, MAN.

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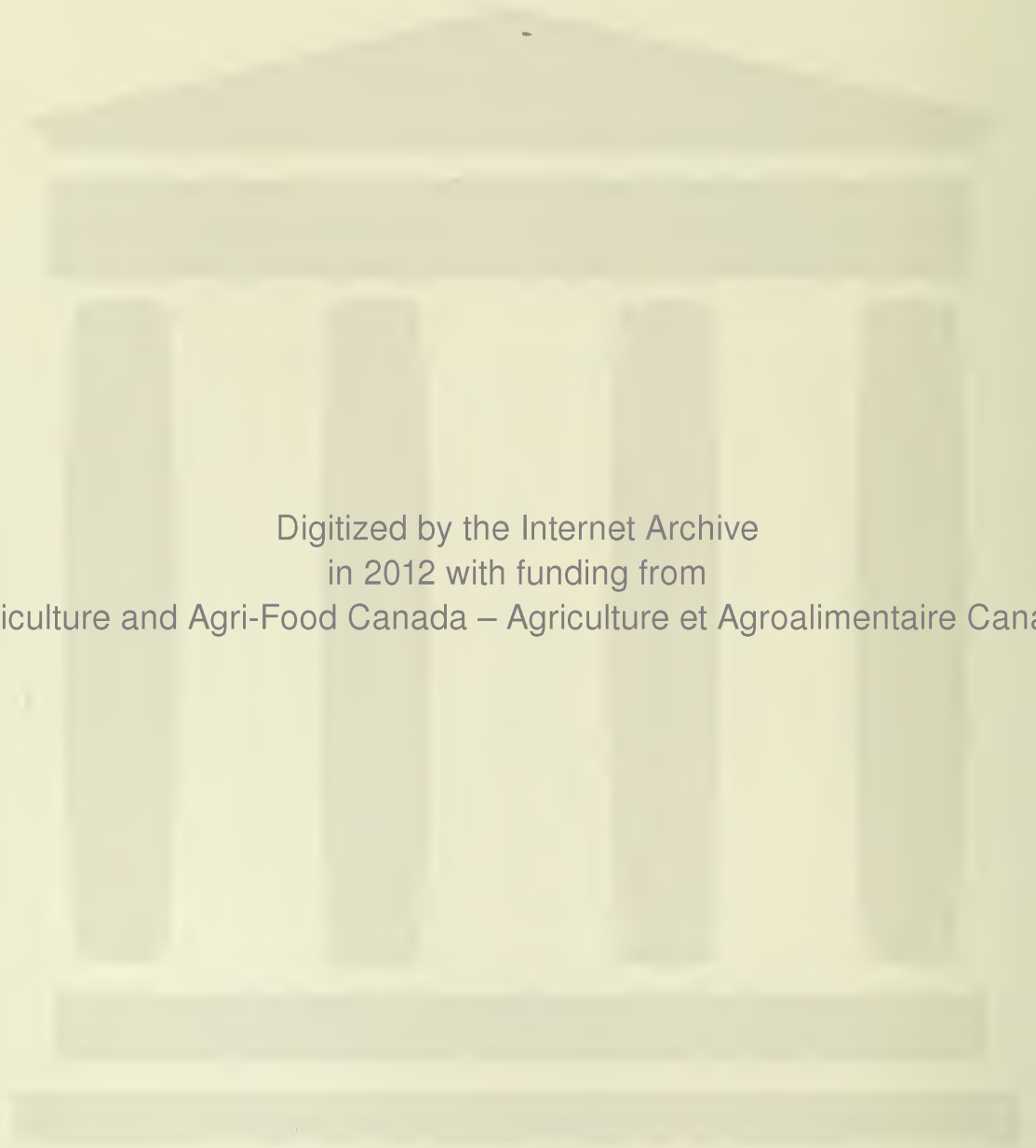


CONTROL OF COUCH GRASS IN MANITOBA

Agropyron Repens

Other Common Names—Quack, Twitch, Scutch

Foreword

Couch grass has been a menace to the farm operations of generations of farmers in the British Isles, in Europe, in the United States, and in Eastern Canada. It was introduced into Western Canada in various ways but mainly through couch-infested brome grass seed. In all probability, the wide spread of couch grass in western Manitoba and eastern Saskatchewan is the result of sowing couch-infested brome grass in the earlier years of settlement.

In the Prairie Provinces land which was formerly farmed and in the aggregate totals some millions of acres has been left uncultivated. Grass has taken possession of most lands that have been abandoned for a long period of years. Recently higher prices for farm products are encouraging farmers to bring this land into cultivation. In certain districts it would be decidedly unwise to break up this abandoned land but in the moister sections it may be a sound policy to bring some of this land temporarily under cultivation. Other parts of the operator's farm could then be seeded down and this newly seeded area could be left for a few years to nature's renovating processes.

It is important in breaking up these abandoned areas that the tillage practices adopted leave much of the crop residue on the soil surface. Especially is this necessary where the soil is sandy and liable to drift. For this reason the tillage practices recommended in this publication will be found useful in breaking up abandoned land. They will also be found helpful in preparing cultivated grass sod land for other crops.

Losses by Infestations of Couch Grass.—Couch grass is a persistent and dangerous weed. Frequently, in attempting to destroy this grass by cultivation, soil drifting was started, later the land was abandoned because of the combination of couch grass and drifting soil. On the other hand, where insufficient cultivation was given, the grass spread and took possession of the land.

The cost of cultivating farm land increases wherever couch is present. Not only are more cultivations necessary in order to keep the grass in check, but because of the presence of the couch rootstocks, the draught of the cultivating machinery is increased.

Couch grass has spread into many farm windbreaks where it has taken possession of the surface soil. Usually deterioration of the trees commences shortly after the grass becomes established.

Infestations of sawflies in couch grass often spread to neighbouring grain crops. Couch grass is also a host plant for the ergot disease.

The sale value of couch-infested farm lands is often seriously reduced.

Spreading Habits.—This grass spreads from seed and from underground rootstocks. The seed is distributed as an impurity in the seed of forage or cereal crops. Other agencies including wind, water, farm animals and farm implements contribute to the distribution of this grass. Couch grass has the habit of retaining its seed for some time after ripening. Thus, ripe seed may be found in hay and straw and when used as feed or bedding, the seed will often be returned to the land in barnyard manure. Where a combine is used to thresh the crop grown on a field infested with couch grass, there is every possibility of the couch grass seed being spread with the straw over the land.

However, it is the rapid spread from the running rootstocks or underground stems that creates the most formidable problem in controlling this weed. The rate of spread is very rapid. A single couch grass seedling in one season may develop into a patch one foot wide. As the patches increase in size, the rate of infestation is accelerated. New patches are established by cultivators, harrows, etc., dragging the rootstocks to new locations.

A quarter section of land abandoned to couch grass sod.

Opportunities for Experimental Work.—On the Brandon Experimental Farm some years ago couch grass on part of the Farm presented a serious problem as periodic flooding of this land sometimes restricted the number of cultivations and, under any condition, eradication with horse-drawn equipment was a slow and laborious process. Several years ago, additional acreage was purchased for the Brandon Farm and couch grass was quite widespread on this property. In 1935, a Reclamation Station of 1,280 acres was established under the Prairie Farm Rehabilitation Act in the Melita district. At that time there were between 200 and 300 acres of well-established couch grass on this property. This extensive acreage of couch grass on the Reclamation Station and on the additional land purchased at Brandon afforded an excellent opportunity to investigate methods of eradication.

Chemical Destruction of Couch Grass

Experimental investigations using sodium chlorate and the commercial product Atlacide indicated that the chemical destruction of couch grass is possible. Where there are large patches, cultivation is less costly and leaves the land ready for crop, whereas chemical destruction renders the land unproductive for one or more years. However, where only a few small patches are present in a field chemical destruction can be used to good advantage.

It has been proved that applications of Atlacide made in September shortly before the couch grass goes into winter dormancy are more effective than applications made at any other season of the year. It has also been found that two or more follow-up applications are advisable. Atlacide can be applied as a dust, or it can be mixed with water and used as a spray. One gallon

of water for each 100 square feet to be sprayed gives a good coverage under most conditions. At least two pounds of Atlacide per 100 square feet of land is necessary in the initial treatment. The quantity used in the follow-up sprayings or dustings will depend on the number of plants persisting at the time of applying the chemical.

Five-year average yield wheat after breaking couch grass—24 bushels per acre.

Farm Implements Tested in Couch Eradication Experiments

The use of tractors and heavy tillage machinery has revolutionized farming operations. This is particularly true of the handling of land infested with couch grass. The use of power equipment has made it possible to destroy the couch grass on larger fields. It has made it possible to have the land worked more frequently and at the proper times.

In the destruction of couch grass on the Brandon Experimental Farm and on the Reclamation Station at Melita, various types of power equipment were used. The following outline of the usefulness of the various machines is based on observations resulting from their use on the Brandon Farm and at the Melita Station.

The Plough.—Formerly all agricultural textbooks and bulletins dealing with couch grass destruction recommended starting with the plough. The follow-up work consisted of tearing the furrow slices apart. This was usually slow and uncertain especially in soils containing a percentage of clay. Where modern power equipment is available the plough can be dispensed with and surface cultivation of the sod will be found more effective and less costly than where the plough is used.

Cultivators.—Either the stiff-tooth or spring-tooth cultivator equipped with narrow points can be used satisfactorily for the initial tillage operation where couch has not formed a dense sod or in the case of sandy lands even where the sod has developed. A cultivator is also useful in follow-up tillage on both light and heavy soils since it has a less pulverizing effect than the disk and leaves more trash on the surface to protect the soil from erosion.

One-way Disk.—On medium and heavy soils, the one-way disk can be used to surface work grass sod and for disking lighter infestations. Where a solid sod of grass is to be worked, certain precautions are advisable. Wheel weights should be attached to the wheels and the blades of the disk should be sharp. It is important that the adjustments of the disk should be set so that the furrow slices are turned completely over. Under some conditions, it may be helpful to load the disk with about 300 pounds of iron or a few sacks of earth.

The secret of success in using the one-way disk is to "shred" the soil. This can be accomplished by over-lapping one-half the width of the disk. Thus, half the disk is turning over the solid sod while the front half of the disk is cutting into narrow strips the over-turned sods from the previous round. When these narrow strips of sod are dried out, they can be broken down readily in subsequent cultivations.

Rod Weeder.—Where there is only a light infestation of couch grass and little trash in the soil, the rod weeder can be used provided the soil is sufficiently loose to permit the rod weeder to penetrate. Where there is medium or heavy infestation of couch grass the rod weeder will not operate properly.

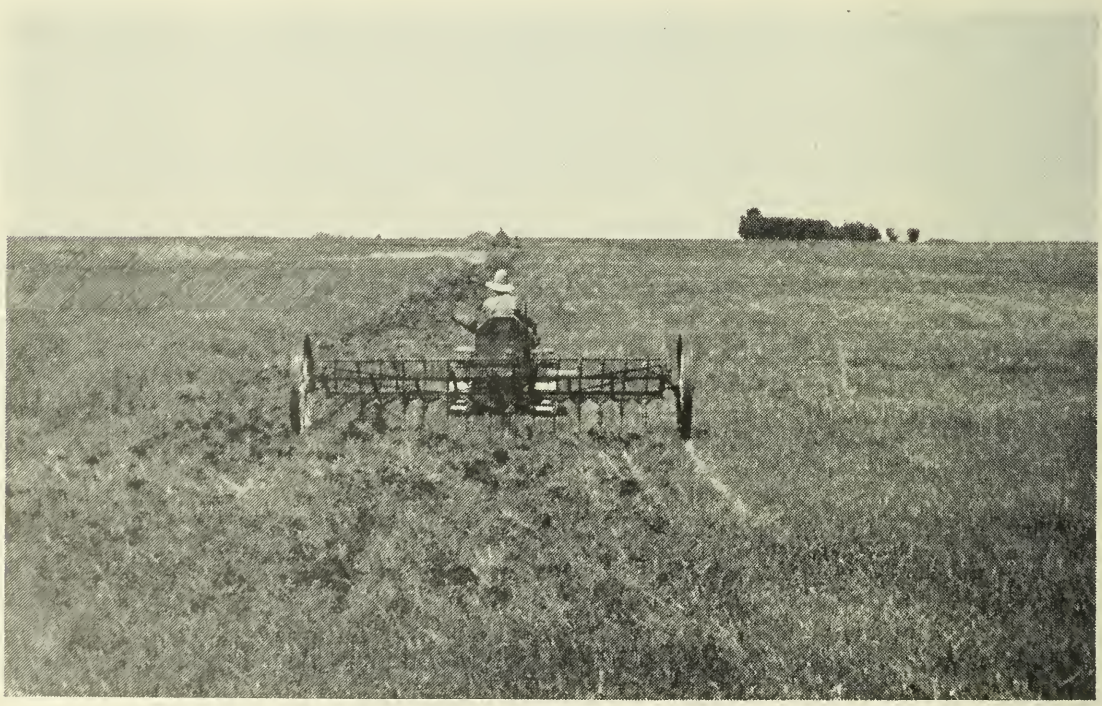
Disk Harrows.—Disk harrows do not have sufficient weight for the initial cultivation of couch sod. They can be used in subsequent tillage to a very limited extent. Used more than once or twice in a season, they pulverize the soil and are apt to bring about a drifting condition.

Chain Harrows.—Chain harrows are used to some extent in couch grass eradication in moist climates where the main objective is to bring the couch grass roots to the surface where they are then burnt or removed.

Under prairie conditions where the main objective of tillage is to dry out the surface soil and the grass rootstocks the chain harrow only packs the soil, retards aeration and gives the rootstocks in the soil better growing conditions.

Other Methods of Control

Back Setting.—The pioneer system of preparing prairie grass lands for crop consisted of shallow breaking followed by turning the sod back with the



First cultivation of couch grass sod with narrow points on the cultivator.

plough later in the season and covering with two or three inches of fresh soil. This was called back setting. This plan with modifications has been recommended in couch grass control. Where only horse-drawn farm tillage implements are available especially where these are in poor state of repair, back setting later in the season may be helpful. Where power equipment is used carefully, back setting is not necessary in destroying well established couch grass sod. The grass in the top three inches of soil can be dried out by frequent tillage and where there are a few rootstocks more deeply buried these will usually rot during the winter.

Smother Crop.—Smother crops of heavy seedings of barley or millet may be found helpful in retarding the spread of couch grass patches on land that must be kept in production. Smother crops will only be useful where the patches are small and the grass not well established.

Degree of Infestations an Important Factor

Fields infested with couch grass can usually be divided into three main divisions based on the degree of infestation—

1. Fields that are in the initial stages of infestation where there are only a comparatively few small scattered patches of couch grass.
2. Fields where the patches are numerous and of fair size.
3. Fields where the grass has taken complete possession.

In the first group the rootstocks are young and vigorous and the growing points of the rootstocks are sharp and penetrate the full depth of the previous cultivations. Since these patches are small it may be possible to give sufficient cultivation to dry out the rootstocks in the top soil and to starve those that are more deeply buried.

In the second division where the patches are larger and scattered over the field, the rootstocks in the centre of the patches will often be found in the top three inches of soil, whereas on the edges of the patches the rootstocks are extremely active penetrating both outward into new territory and downward to the full depth of previous ploughing or cultivating. Where this condition exists eradication by cultivation is difficult since so much of the grass is in the aggressive stage around the borders of all the patches.

The third division is where the couch grass has spread and has established a sod cover over the field. After a period of two or three seasons practically all the rootstocks become established in the top three inches of surface soil. This creates a condition that is helpful in eradication since only the top three inches of soil need be worked in order to dry out the couch grass rootstocks.

Eradication of Small Patches.—Small patches of newly established couch grass are usually in a vigorous state and rootstocks may be found very near the surface or located four or five inches below the surface. One of the best systems to adopt in destroying small areas of this grass is to undertake this during the summerfallow year. As soon as the grain crop is cut in the autumn, cultivation or disking of the couch grass patches should be started. Several fall cultivations followed by spring and early summer tillage will prevent the spread of the grass and thin it out, provided care is exercised to avoid dragging the rootstocks to new locations. At the time the remainder of the field is summerfallowed special attention should be paid to the couch grass infested areas so that destruction can be completed in the one season.

Handling Large Couch Grass Patches.—Where large patches of couch grass have become established on cultivated land, the cheapest and most effective method to adopt is to seed the field down to grass and leave undisturbed for two or three years. During this time the couch grass rootstocks will become established in the upper three inches of soil. The methods of eradication outlined in the succeeding paragraphs can then be applied.

Clean crop of wheat following the summer-fallowing of the couch grass.

Breaking Couch Grass Sod

Couch grass thrives particularly well on light sandy soils that drift readily when broken up. The grass is also found on many lands where the soil contains a high percentage of clay and where drifting seldom takes place. Two methods of surface tillage are suggested, one for soils that erode easily, the other for the more stable soils.

Couch Grass Destruction on Light Soils.—Preparatory treatment, whether the soil is light or heavy, consists of removing the above-ground vegetation. Frequently, by early June, couch grass has made sufficient growth so that it can be cut and removed as hay. Close pasturing or clipping for two years before breaking the sod is preferable since this prevents seed formation during this period. For the reason that the extensive use of the disk sometimes brings about a drifting condition, the cultivator is preferred for grass destruction on light soils. Either the stiff or spring-tooth cultivator can be used and should be equipped with sharp narrow points. The first cultivation is quite shallow and the second and third cultivations are given at several days interval and at a slight angle to the preceding tillage. A considerable percentage of the rootstocks are pulled to the surface by the cultivator teeth and at this stage, it is often necessary to cut up this material by using the one-way disk for one operation. Precaution should be taken to have the disks well sharpened. The ordinary cultivator can be used for further destruction and the number of additional cultivations will depend on the season's moisture and the nature of the soil.

Couch Grass on Medium and Heavy Soils.—Where there is no danger of soil drifting, a one-way disk in good repair with the disks well sharpened can be used to shred the couch grass sod. This is accomplished by over-lapping one-half with the one-way disk. This system has been found much more effective than cross disking or going over the field lengthwise a second time. The half of the disk that is in the undisturbed solid sod prevents any side slippage of the disk and the furrow slices turned over by the disk in the first round are cut into narrow strips that are easily knocked apart by subsequent cultivations. Less tillage is required where the one-way disk can be extensively used than where destruction is dependent on the use of the cultivator.

Farmers keenly interested in couch grass demonstration investigations.

Summary

1. The introduction and use of power equipment on farms has completely revolutionized the cultural methods possible in the destruction of couch grass.

2. Couch grass rootstocks become established in the surface three inches of soil when the grass is left undisturbed for at least two or three years.

3. Shallow tillage of solid couch grass is most important. At no time should the cultivation be deeper than the running rootstocks, usually not more than three inches.

4. Couch grass spreads most rapidly in moist seasons, it is also more difficult to dry out the rootstocks and the soil in wet than in dry seasons.

5. Repeated shallow cultivations or diskings spread over a period of several weeks will dry out and finally kill the rootstocks.

6. The cultivator equipped with narrow points leaves most of the crop residue on the soil surface and thus is a safer implement than the one-way disk to use on lands that erode readily.

7. The one-way disk, properly adjusted, will destroy grass sod with less labour than where the cultivator is used. It is particularly useful on heavy and medium soils during the early stages of cultivation. During the later stages, the cultivator will often be found to be quite as effective as the one-way disk. It can be operated at less cost and is less likely to create a soil drifting condition.

8. Where a field is broken up that has been abandoned for some years and on which grass has become established, some of the seed shed during the years of abandonment may germinate and establish seedling plants. These plants, when left undisturbed, will develop rootstocks and thus infest the field again. To overcome this difficulty, harvest tillage of the first year stubble is recommended. The cultivating or disking of the stubble behind the combine will up-root the young seedlings. One or two shallow cultivations may be necessary to complete the destruction of these invaders.

9. Chemical eradication when there are only a very few small patches of couch grass may be less costly and more complete than when cultural methods are followed. At least three sprayings or dustings will be necessary and care should be taken to treat the land well beyond the borders of the couch grass infestations.

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