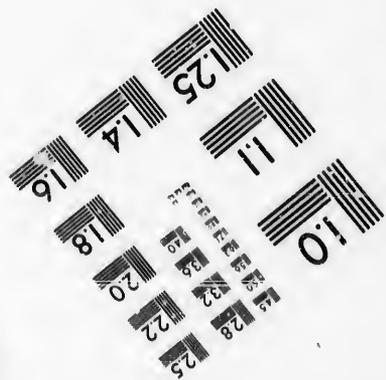
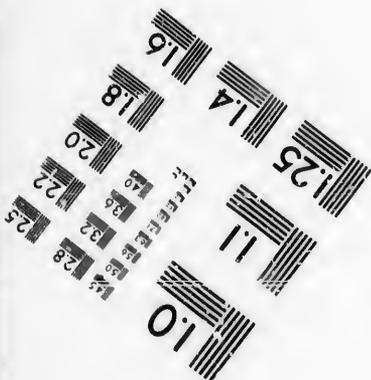
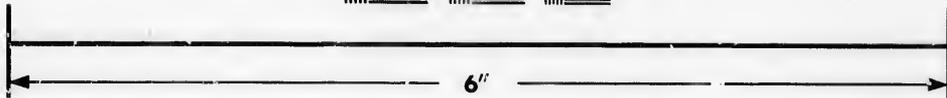
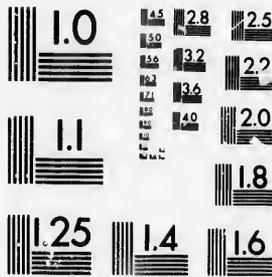


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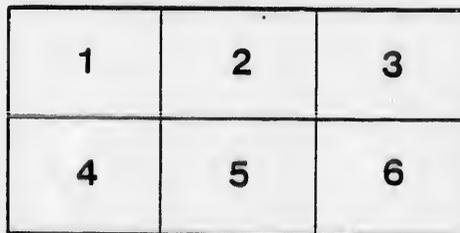
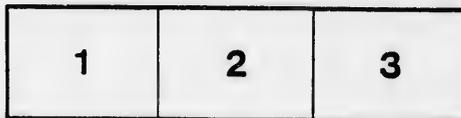
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No. 3

NOXIOUS WEEDS

—AND—

HOW TO DESTROY THEM

DEPARTMENT OF AGRICULTURE
AND IMMIGRATION

WINNIPEG, MAN.

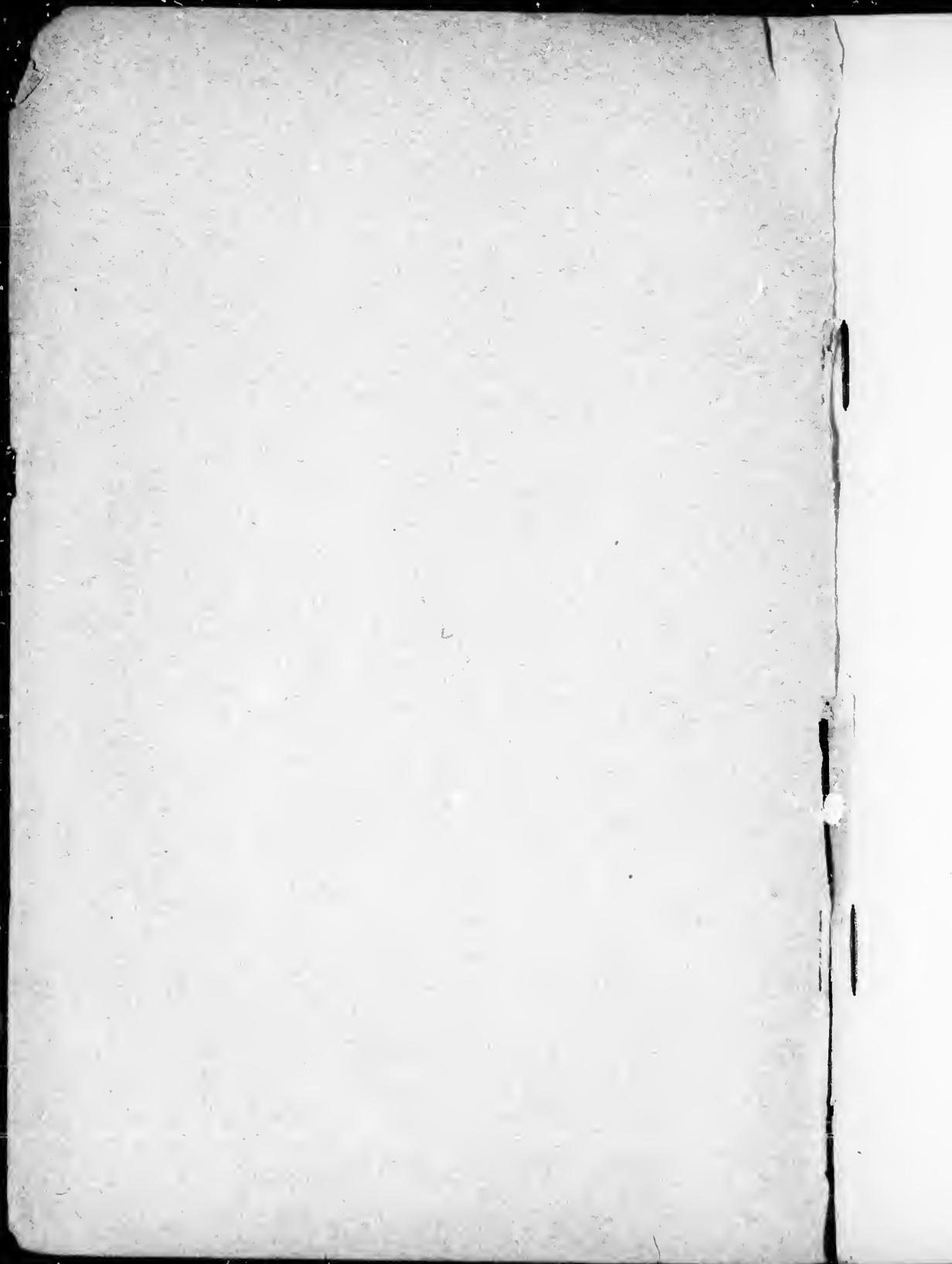
1897

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No. 3

NOXIOUS WEEDS

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DEPARTMENT OF AGRICULTURE
AND IMMIGRATION

WINNIPEG, MAN.

1897

DAVID PHILIP, QUEEN'S PRINTER.

NOXIOUS WEEDS OF MANITOBA.

Among the many problems facing the farmers of this Province one of the most important is the ever increasing spread of noxious weeds.

During the past three years the Department of Agriculture has given increasing attention to this question, and has embodied much of the information obtained, and conclusions based on the same, in three former publications.

The first Bulletin issued in 1894, consisting of three prize essays dealing specially with seven of the most troublesome weeds, proved very acceptable. In 1895 a special pamphlet was devoted to "Tumbling Mustard," and "Hare's Ear Mustard." Last year, 1896, the Bulletin dealt somewhat fully with the whole subject, and gave a great amount of information, which has proved of real value to the farmers of the Province. The past season must have convinced many who have heretofore been slow to learn, that the battle with weeds is after all a serious matter. The season was peculiarly favorable to a luxuriant growth, much grain was badly sown very late, and the result was largely a victory for the weeds. This has had the effect of greatly arousing the interest of farmers, and there has been much enquiry relative to the character of different weeds and weedy plants, and the best means of destroying them. Through the kindness of the Dominion Minister of Agriculture, the Province has again had the advantage of a visit from Dr. Jas. Fletcher of the Central Experimental Farm, who is well known as an authority on agricultural subjects. Many meetings were held in different parts of the Province, at which he expressed himself as greatly pleased with the efforts of this Department in the matter of the eradication of weeds. He also spoke in very high terms of the Bulletin of 1896, saying that "For use in Manitoba there is not a single publication which has appeared in any language, which can compare with this pamphlet." Of this Bulletin over 12,000 copies have been distributed to farmers, teachers and others in the Province, and as a second edition is required for distribution this year, a few changes have been made in the same, and some extra pages added, to include a description of some special weeds that appeared for the first time in several parts of the Province, during the past year. The result is the present pamphlet.

IMPORTANCE OF THE SUBJECT.

Perhaps no more cogent argument can be adduced for the need of earnest, systematic, and united action, than the great financial loss sustained annually by the farmers of the Province through noxious weeds. It may be stated under the following heads :—

1. The impoverishment of land, and a consequent reduction in productive power for the future.
2. Loss in land values.
3. Weeds greatly reduce actual yield.
4. Cost of eradication.
5. They add largely to labor and cost of harvesting and marketing.
6. They cost as much to thresh as the same measure of good grain.
7. Loss of dockage at elevators, and freight on dirt.
8. Many crops are altogether lost through being cut down under the "Noxious Weeds Act."
9. The cost of statute labor and payment of municipal officers in carrying out the Act.
10. Shrinkage in values of dairy products.
11. Damage to machinery and stock.

All engaged in agriculture are aware of these losses, but few seem to realize what they mean in actual cash.

WEEDS AND THEIR ORIGIN.

Weeds are often tersely defined by farmers as dirt. It is a good definition, for dirt is matter out of place, and weeds are plants in the wrong place; namely, where they may do harm.

They are directly hurtful to crops by taking nourishment from the soil, and moisture and light from the crop.

Indirectly they involve loss in the various ways already indicated.

Their seeds are found in all soils, and experiments have been made which show that ordinary garden soil contains 1,300,000 such seeds to the acre.

Ordinary manure, as put upon fields, contains about one million seeds per acre.

Experiments made with these soils and seeds, have shown that from 80,000 to 175,000 per acre, actually germinated in one year.

Many species of weeds have seeds possessed of extraordinary vitality enabling them to survive for years, either in the soil or elsewhere, until the proper conditions for germination and growth present themselves.

This is particularly the case with some of our worst weeds belonging

to the Mustard family, which have seeds containing oil, with seemingly great preservative power.

For the origin of noxious weeds it is usual to look to other countries, from which seeds have come in various ways. Undoubtedly many do reach us from abroad, but in the list given herewith are a considerable number which are indigenous to the country. Of native growth, they have found in cultivated soil very congenial homes, and have become troublesome pests. Instances of this class are found in Pasture Sage Brush, Sunflowers, Showy Lettuce, Gum Weed and Treacle Mustard. It is necessary, then, that a sharp look-out be kept upon our native plants, as many of them are capable of giving much trouble in the future. Whenever any such are becoming unduly plentiful upon any farm, prompt action should be taken to ascertain their true character, and the best methods of destroying them.

Foreign weeds have, of course, come to us chiefly from the United States, or from Europe by way of Eastern Canada and the United States, or direct. A curious instance of the latter case, seems to be found in a new arrival of which more will be said later. This plant, which for want of another English name may provisionally be called the "Russian Pig-weed," has come, as its name implies, from Eastern Russia. It was first noted in Canada near Winnipeg, and, as it has not been officially noted in the United States, the natural conclusion is that it has come to us direct from the country named. Ready means for the conveyance of such seeds are furnished by immigrants' baggage, or seeds and trees imported for experimental purposes. In the latter case too much vigilance cannot be exercised, especially when the importation is from a country similar to this in climatic conditions.

DISTRIBUTION OF SEEDS.

The rapid spread of noxious weeds is easily accounted for when we take into consideration the agencies at work. Everything is in their favor. Nature does the work in many ways.

1. The wind wafts seeds, constructed to float in the air, immense distances, or drives them along the ground with dust or snow, or, in the case of the different "tumble weeds," sends the parent plant careering for miles over the prairie, scattering thousands of seeds in its course.

Water in creeks and rivers carries them in myriads, and leaves them to grow along broken banks, or on overflowed lands. An illustration of this on a large scale is to be seen near the mouth of the Red River, where hundreds of acres of land have been overrun with Canada thistles seeded in this manner.

They are also distributed by birds and animals in droppings, or by being attached to the coats of the latter, in the form of burs and ticks of various kinds.

2. They are also distributed by human agency.

Foul seed, which is dear at any price, is purchased for its seeming cheapness.

Matured plants are dragged over fields by harrows or seeders, dropping seeds as they go.

They are carried in hay, fodder and manure ; and on wagons, threshing machines, binders and railway cars

Screenings from threshers and fanning mills are often neglected, and even thoughtlessly plowed into fields.

The knowledge of these facts suggests partial safeguards against future loss. Prevention is better than cure, and an intelligent application of the lessons of the past will go far to mitigate danger and loss from weeds in the future. The following sound maxims are reprinted from the Bulletin of 1894 :—

PREVENTATIVES

1. Never sow foul seed, even if clean seed costs double the price. Count the after-cost.
2. Cleanings of cars should be collected and destroyed.
3. No matter on whose farm a threshing machine has been working, see that it is thoroughly swept down from top to wheels, and run empty at least five minutes, before coming to your farm.
4. Do not thresh on different spots, have your regular threshing sites and watch them carefully.
5. Clean down binders and implements before moving from foul to clean fields.
6. If possible get your farm fenced in order to keep your neighbor's cattle from straying over your fields.
7. See that your wagon wheels and boxes, and horses' feet are clean before driving over your fields.
8. Allow no man to drive across your fields, even to secure a near cut.
9. Get all your feed crushed, even though you think it is clean.
10. Never spread fresh manure on your fields, nor allow weeds to mature on your manure pile.
11. Watch your watercourses.
12. Never allow weeds to ripen on your farm, and encourage your neighbors to take the same precaution.

ERADICATION.

The destruction of weeds can only be successfully accomplished by a careful study of the conditions of plant life, and the characters of the various species that are found troublesome.

They are usually classed as—

1. *Annuals*.—These include all which grow from seed and mature in one season, if the seeds germinate in Spring. They have generally small fibrous roots, which seldom penetrate very deeply into the soil, and they produce a large quantity of seeds. This is nature's safeguard against

their extinction, through the many vicissitudes to which annuals are especially subject. Examples of this class are Wild Mustard, Lamb's Quarters, Wild Buckwheat, etc. Some annuals under certain conditions belong also to the next class, as many seeds germinate in the fall and make sufficient growth to withstand the winter. They complete their growth early the following year. Examples of these are Stink Weed, often miscalled French Weed, and Shepherd's Purse. It is evident that if the germination of the seeds can be secured under such conditions, so that, by harrowing or some other method, the slender delicate roots can be exposed to sun and wind, their destruction is ensured. If all seeds germinated at once this would be a comparatively easy task; but, as we have already pointed out, seeds of this class have often extraordinary vitality, and if too deeply buried will lie dormant for years, only to give an unexpected crop when brought to the surface.

2. *Biennials*.—These grow from seed and require a second year in which to complete their growth; the first year being spent in collecting and storing up a supply of nourishment, to be expended in maturing flowers and seeds. The Wild Parsnip, Biennial Wormwood, Blue Bur and several others are in this class. They require the same treatment as annuals.

3. *Perennials*.—These continue growing for several years. Weeds of this class are the most dangerous and troublesome, for they are propagated, not only by seed, but most of the herbaceous kinds also by creeping underground rootstocks, which send up shoots and ultimately form new plants. The Wild Rose, Canada Thistle, Perennial Sow Thistle, some Sunflowers, Couch Grass, etc., are examples. The Plantain, Dandelion, Ox-Eye Daisy and others grow only slowly from the root by off-sets, but are further helped by the production of quantities of seed.

Plants of this class depend largely for their life and vigor upon the nourishment stored away in their roots, which is manufactured in the leaves under the influence of light and air. If the supply of food be cut off, the plant must soon become exhausted and die. This indicates the method to be pursued in the work of extermination. Failing the possibility of removing the rootstocks altogether from the land, which is of course the better plan, the next best is to starve them to death by rigorously cutting off the food supply, in the destruction of growth aboveground.

DETAILS OF PRACTICE.

Annuals.

Under this head we will deal with Stink Weed, and the treatment suitable for the extermination of this most noxious of noxious weeds, will be suitable for all the annual weeds, although with many it will not be necessary to apply it so rigidly.

1. Estimate in the fall how much land can be thoroughly summer-fallowed during the next summer. Do not undertake one acre more than can be done well.

2. Cultivate this quite shallow immediately after harvest. Harrow immediately after and as often as seeds germinate. See that no plants how above ground when winter comes, as some kinds of these will retain

their vitality over winter, and shed seeds very early in spring, before you are ready for summer-fallowing.

3. Harrow again first thing in spring.

4. Spring-plow and sow all the cultivated land not set apart for summer-fallow, and if it appears that there is rather too much land under cultivation for the available force, seed down a part with grass which will tend to keep it out of mischief till overtaken.

5. After seeding cultivate summer-fallow slightly deeper than was done the previous fall, and harrow as often as weeds appear.

6. Now commence plowing so as to have all plowed before any seeds have formed.

7. Harrow each evening the land plowed during the day and repeat as often as weeds show above ground. The object of this is to encourage weed-growth and to destroy the young plants.

8. The following season sow without any further cultivation and hand pull all the weeds which appear in the crop.

9. Gather the weeds in a sound bag to prevent any seeds from falling out.

10. Burn all the plants, because, if thrown in a pile, the under ones will mature seed.

11. In the fall treat as in the fall preceding summer-fallow, and sow the following spring without plowing. On land infested with weed seeds, never plow and sow without giving all the seeds in the surface soil an opportunity of germinating, both before and after plowing. Never be deceived by one clean crop. Millions of seeds may be buried below the germinating depth and will grow in future years.

Biennials.

These may to a considerable extent be treated in the same manner as annuals; but as some species, which are ordinarily true biennials, will live three years or possibly more, if seed production be prevented by mowing or cutting the stem above the crown of the root, another method is often advisable. The roots below the crown should be cut with hoe or spud—the latter being a large strong chisel attached to a fork-handle. It is a valuable instrument, which may be used to much advantage in cutting thickened roots below the surface.

Weeds of this class are usually most abundant in old fields, along road-sides, and in waste places where the soil is seldom disturbed. They must be destroyed in these places, if the work of clearing the seed out of cultivated fields is to be made effective.

Perennials.

For the destruction of perennials the following suggestions, made by Dr. Dewey, of the United States Department of Agriculture, are so admirably stated that they are here reproduced. No 2 is probably out of the question as a practicable remedy at present, but may be valuable in the future, and so is inserted.

The Department begs here to acknowledge assistance in the preparation of this Bulletin, derived from papers by Dr. Dewey.

"To destroy perennial weeds, seed production must be prevented and the underground portion must be killed. Seed production may be prevented by mowing when the first flower buds appear, the same as in the case of annuals or biennials. The best method for killing the rootstocks vary considerably according to the soil, climate, character of the different weeds, and the size of the patch or the quantity to be killed. In general, however, the following principles apply:

"1. The rootstocks may be dug up and removed, a remedy that can be practically applied only in small areas.

"2. Salt, coal oil or strong acid applied so as to come in contact with the freshly cut roots or rootstocks destroys them for some distance from the point of contact. Crude sulphuric acid is probably the most effective of comparatively inexpensive materials that can be used for this purpose, but its strong corrosive properties render it dangerous to handle.

"3. Rootstocks may be starved to death by preventing any development of green leaves or other parts above ground. This may be effected by building straw stacks over small patches, by persistent, thorough cultivation in fields, by the use of the hoe or spud in waste places, and by salting the plants and turning on sheep in permanent pastures.

"4. The plants may usually be smothered by dense sod-forming grasses or by a crop like clover or millet that will exclude the light.

"5. Most rootstocks are readily destroyed by exposing them to the direct action of the sun during the summer drought, or to the direct action of the frost in winter. In this way plowing, for example, becomes effective.

"6. Any cultivation which merely breaks up the rootstocks and leaves them in the ground, especially during wet weather, aids in their distribution and multiplication, and is worse than useless, unless the cultivation is continued so as to prevent any growth above ground. Plowing and planting ground in April and May, and cultivating at intervals until the last of June, then leaving the land uncultivated during the remainder of the season, is one of the best methods that could be pursued to encourage the growth of Couch Grass and many other perennial weeds.

The above methods deal generally only with the destruction of weeds on cultivated land.

As they are so largely prevalent along the roadsides, railways, and waste places, it is evident that any full consideration of the subject requires that this aspect of the question should not be overlooked.

"The Noxious Weeds Act," which is reprinted herewith, has indeed provided to some extent for their destruction upon these lands. It will be noted, however, that whatever may be the spirit of the Act, in actual practice the work resolves itself almost entirely into simply cutting such weeds as are proclaimed, once or twice in the year. Doubtless this does great good, but as some of our worst weeds are perennials, and others

which are annuals, can ripen seed after being cut, more effective and permanent measures seem to be necessary. The annual outlay to land-owners and municipalities in carrying out the Act is very great, and is likely to increase.

As a contribution toward the solution of this problem, Rev. W. A. Burman offers the following observations and suggestions :

"There are many instances on record, of low-growing tender plants being used to choke out plants which seemed to defy destruction in other ways. In New Zealand, the "wild flax," which became an almost intolerable nuisance, and seemed to get new life and vigor out of every attempt to destroy it, at last yielded, it is said, to the subtle attacks of the tender English Chickweed, which smothered it out of existence wherever it obtained a hold. The application of this principle to our own fields has been suggested above in the reference to "smothering crops." From observations made during the past few years in the Province, the writer is persuaded the same principle might be applied to our roads, railway grades, and waste places in both town and country.

"The plant suggested for this purpose is the common White or Dutch Clover. It is possessed of great vitality, grows easily from seed, is proof against our severest frosts, spreads rapidly and is very persistent of growth. As an illustration of what it can accomplish, may be noted certain streets in Winnipeg and West Selkirk, where it has killed out every weed. From the latter town it has been carried along the ditches to the Red River, in the lower reaches of which it has, in many places, asserted itself above all other vegetation on the river banks.

"The suggestion is therefore made that municipalities, railway corporations and individuals be encouraged to make trial of this new method of fighting weeds in places where cultivation is impossible. A few dollars spent in seed scattered along roads, railway grades or on waste places would, I am convinced, soon lead to a wonderful reduction in the annual cost of destroying weeds. It would have the further advantages of providing pasturage upon land now worse than useless, of binding the surface of grades, and of blotting out the patches of unsightly weeds which are such eyesores in our towns."

DESCRIPTION OF VARIOUS WEEDS.

At the end of this pamphlet will be found a table enumerating and describing briefly some 75 weeds of a more or less dangerous character, found within this Province.

Of some a fuller account seems to be necessary, either because of their present dangerous character, or because, though as yet but little known, they are likely to become hurtful pests in the near future. Some of these have been described in former publications of this Department, and those descriptions are in the main here reproduced.

STINK WEED, OR PENNY CRESS (*Thlaspi arvense*, Linn.)*

Annual. Grows to a height of from 2 to 18 inches. The smaller plants have a single stem with few branches. The larger are branched and bushy. The leaves are somewhat elongated, are about $1\frac{1}{2}$ inches long and set right on the stem without a stalk. The blossoms are very small, are white and have four petals and for sepals, they are in clusters which are extensions of the main stem or of the lateral branches, and each one is attached to the stem by a little stalk of its own. The flowers at the lower part come out first, and the pods may be almost ripe while the upper part is still in bloom. The distinguishing features are its disagreeable smell and its peculiarly shaped pod. The pod is of a light green color, flat, from $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, heart shaped and deeply indented at the top. It has two cells, and each cell contains from four to eight seeds. The seed is similar to, though much smaller than that of cauliflower. Plants growing when winter comes on will retain their vitality and produce and shed their seed very early, and these seeds will often reproduce twice in the same season. The seed being small will not germinate unless very near the surface, and when buried below the germinating point will retain its vitality for many years. The milk produced by cows which have access to Stink Weed is not fit for use, and unless such stock is removed from such pasture two or three weeks previous to slaughtering the beef is unmarketable.

WILD MUSTARD (*Brassica sinapistrum*, Boiss).

The "Charlock" of England. An annual, growing from one to four feet in height, according to soil and situation; sometimes very branching, stalks hairy till near maturity, has a profusion of yellow flowers similar to those of turnip and others of the Cruciferae. The seed pods are long and contain a number of seeds each. In common with all the members of the mustard and cress family, the skin of the seed contains an oil, which prevents decay for a long time, and it will remain in the ground for years till the conditions are favorable, when it will grow with unabated vigor. It takes longer to mature than Stink Weed, but will ripen seed if pulled up after the seed is fully formed. As the bright yellow flowers of this weed make it easily distinguished in a field, it may be hand-pulled on its first appearance. The greatest danger of its introduction is in millet, Hungarian grass, turnip, rape and other similar seeds to which it bears a strong resemblance.

TUMBLING MUSTARD (*Sisymbrium Sinapistrum*, Crantz)

The Tumbling Mustard, sometimes called the Indian Head or Qu'Appelle Tumbling Weed, was in 1895 detected in Manitoba in the district lying between Morris and Myrtle on the line of railway, in cultivated fields on each side of the railroad, as well as south and west of St. Jean, into the municipality of Rhineland. It has now been more widely distributed, principally along railroads, and is rather common from Winnipeg southward. This is not a native plant, but adds one more to the list of aggressive immigrant weeds which have come to us from Southern Europe. In its original home the Tumbling Mustard is for the most

* Often mis-called "French Weed."

part a biennial, producing only a rosette of leaves the first year, and the flowering stem the second season, but in this country it is a coarse, smooth annual weed, which comes from seed every year. It, as a rule, varies in size, from two to four feet in height, and the stem is very much branched above. It bears at the root a rosette of hairy leaves, in shape somewhat like those of the dandelion (fig 4). These are quite different from the smooth, finely divided leaves which later on

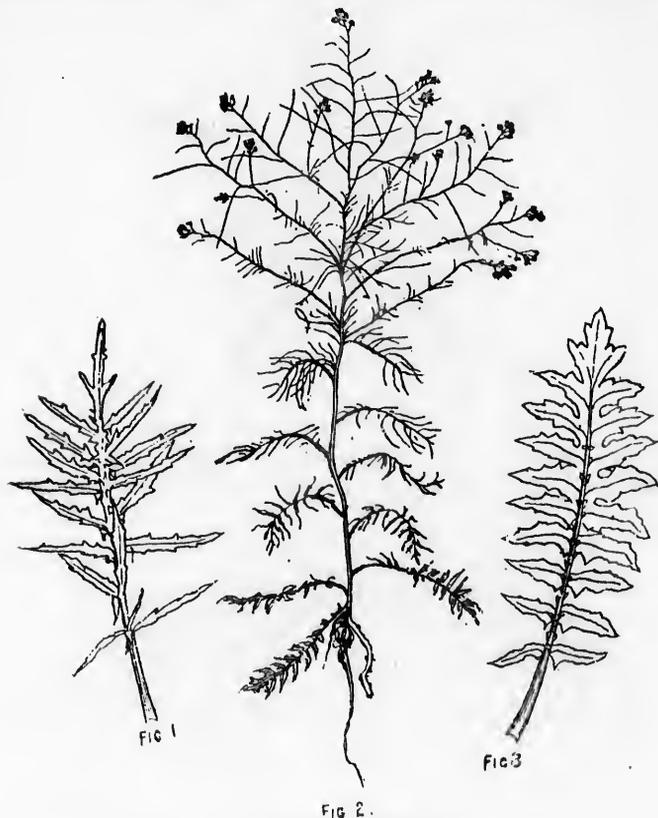


FIG 2.
TUMBLING MUSTARD.

Figs. 1 and 3-- Leaves of young plants near the ground.

Fig. 2-- Plant 30 inches high, showing 10 inches above crop in field. Showing pods on stems and flowers at tips of branches.

are borne upon the flowering stem (figs. 1 and 3.) The pale yellow cross-shaped flowers are composed of four petals like those of all the members of the large Mustard family to which this weed belongs. The stout, erect stem is much branched above, and bears numerous long very slender seed pods, three inches in length (figs. 2 and 5).

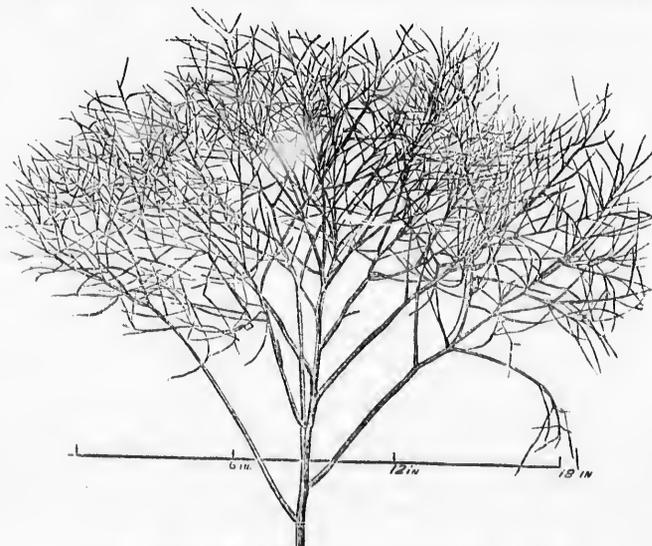
The following extracts, treating on this weed, are taken from the reports of Mr. J. Fletcher, Experimental Farm, Ottawa. The illustrations are from the same gentleman, and appear on pp. 178 to 180 of his 1895-Report :—

REPORT 1892 : "It starts in the spring from seed, and if let alone, will ripen its seed at the same time as mustard, or about wheat harvest



(Fig. 4.) TUMBLING MUSTARD.—A young plant.

If cut off above the ground it will throw out shoots, which, if let alone, will ripen seed before frost comes if the first cutting is early enough. If



(Fig. 5.) Tumbling Mustard.—A tumbler with ripe seeds.

not, the shoots will go on growing until the first frost destroys it. It does not start in the spring from the autumn growth, for that is entirely dead. One seed produces one stock, which lives and dies the same season. The normal size of this plant in Europe is about two feet high, but a large specimen sent to me entire by Mr. McKay for the purpose of counting the seeds, was more than twice that height, with numerous branches covered with long pods (fig. 6). All of these were counted; each



TUMBLING MUSTARD—From a Photograph.

(Fig. 6.)

pod contained an average of 120 seeds, in two ranks, and gave the enormous total of one and a-half millions of seeds from the one plant. These when threshed out weighed 150 grammes (nearly 5½ ounces). The seeds are very small, about half the size of the seed of timothy, and dark reddish-brown in color. There is no doubt but that the introduction of this pernicious weed into the North-West Territories is a most serious matter."

HARE'S EAR MUSTARD. (*Erysimum Orientale*, R. Br)

This plant, fig. 7, is a slender branching annual with greyish-green succulent leaves on the stem, oblong oval in shape and clasping at the base; the root leaves are spatulate, more elongated and not clasping at the base. The flowers are small, of a creamy-white and borne at the tips of the branches; they are followed by square pods, sometimes three inches in length, containing rather large blackish seeds. This has developed into a very troublesome weed, especially in Southern Manitoba. It must be thoroughly eradicated wherever found.

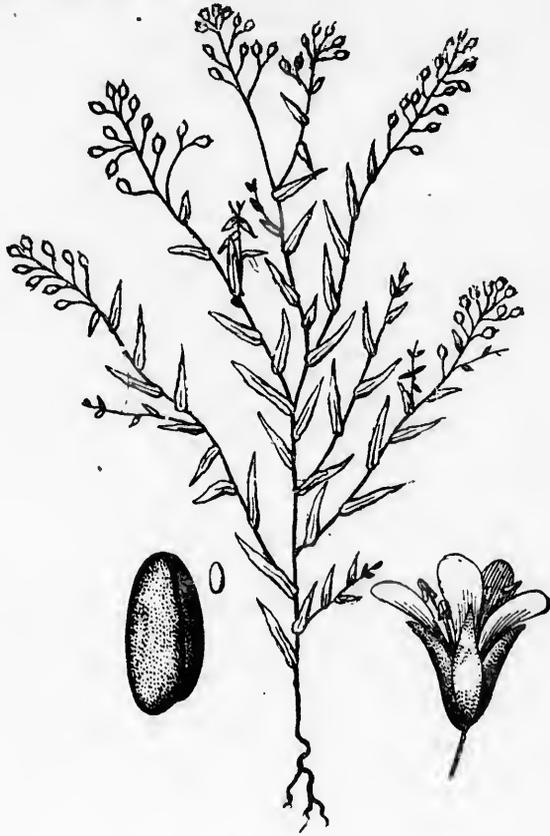


HARE'S EAR MUSTARD (*Erysimum Orientale* R. Br). Fig. 7.

FALSE FLAX (*Camelina sativa*, Crantz).

This plant, a member of the Mustard family, has been introduced from Europe, where it has long been known as a troublesome weed in flax fields. It resembles flax somewhat, but has much smaller flowers and seeds, and its seed capsules are pear-shaped instead of spherical. Fig. 8. It is an annual, like Shepherd's Purse, Peppergrass and most of the other troublesome weeds of the Mustard family. In the northern part of its range, at least, the seeds are seldom matured except on plants which

grow as winter annuals. The seeds germinating in the fall produce a rosette of leaves in the same manner as the dandelion. In the spring a seed stalk is developed from the midst, and after the seeds are matured the plant dies. The seeds germinating in the spring produce plants that usually blossom during the same season, but seldom mature seeds, being killed too early by the frost.



FALSE FLAX. (*Camelina sativa*, Crantz) (Fig. 8.)

Showing plant; flower very much enlarged; seed, somewhat, and very much magnified*

BIRD, OR SUMMER RAPE (*Brassica campestris* Linn.)..

This plant is almost like the better known Wild Mustard, but is quite smooth, with a pale bloom upon it similar to that upon the Cabbage. It is the Rape fed to cage birds, and doubtless often originates from this source. It should be as rigorously treated as Wild Mustard.

BALL MUSTARD (*Neslia paniculata*, Desv.)

This is a tall rank-growing annual, with roughish leaves grasping the stem, somewhat pointed, and from 2 to 4 inches long, the larger ones an inch in breadth. The yellow flowers are borne on a number of long and rather graceful clusters, together forming small panicles. The flowers are very small and produce round pods, somewhat flattened, with a minute beak at top, and with wrinkled markings when ripe. The plant gets its common name from these ball-shaped pods, which are scarcely 1-16th of an inch in length, and contain a single tiny yellow seed. Its habits are those of other mustards. It is found principally in South and South-west Manitoba in grain crops.

PEPPER GRASS. (*Lepidium intermedium*, Gray.)

A slender annual herb, from 12 to 18 inches in height with the general appearance of the Cress family, to which it belongs. The flowers are very small, whitish and very numerous. They are followed by small roundish flat pods, arranged in long clusters and forming a large spreading mass around the central stem. The seeds are reddish in color, much like those of Shepherd's Purse, but larger. They are produced in great quantities, and germinate so readily that the rank growing plants easily choke out young growth, and will prove specially troublesome in wet seasons. Great complaints have been made about this weed in certain districts, and quantities of its seeds have been noticed in cleanings from elevators. Farmers should fight this weed in every way—hand-pulling is of special value—but all plants pulled should be carefully collected and burned.

SPIDER FLOWER (*Cleome integrifolia*, L.)

This is another native plant, found as far north as Peace River, but only in certain localities. It is abundant in one part of the Parish of St. Paul, north of Winnipeg. It grows from 1 to 3 feet in height, has 3 to 7-parted leaves and purple or white flowers, with four petals which soon fall off. The anthers protrude from the flower, and with its loose outer parts give it somewhat the appearance of a spider. Hence the name "Spider Flower." The seeds are produced in one-celled pods, not unlike vetches in shape and size, each containing two rows. The seeds are peculiar in shape, being curled around until the two ends almost meet. This is a troublesome weed when once established on land, and being rather ornamental is often no doubt spared for the sake of its flowers, to the subsequent regret of its admirers.

GUM WEED (*Grindelia squarrosa*, Dunal.)

The Gum Weed is too well known to need a detailed description, fig. 9. Everyone in Manitoba is familiar with its attractive yellow flowers, like small sunflowers, and has learned by experience that beautiful as it is to look at, it is most unpleasant to handle, owing to the abundant sticky juice exuding from the flowers. It is a native annual, producing abundance of seeds, very common along roadsides and in waste places, and is rapidly spreading into fields and upland meadows.



GUM WEED (*Grindelia squarrosa*, Donal). Fig. 9

A tincture made from the leaves, it is said, will cure the effects of poison ivy.

SHOWY LETTUCE (*Mulgedium pulchellum*, Nuttall).

A perennial native plant, a little like lettuce in its general appearance and habits. Its foliage is, however, scantier, and often has a reddish appearance. The light blue flower heads are half an inch across, and grow in racemes. The seeds float on the wind like those of the Prickly Lettuce, figured below. They are about a quarter of an inch long.

This weed is becoming too common in fields, and may, unless care be taken, become here, what the "Prickly Lettuce," described below has become in the Northern States—a very serious pest. It is very plentiful in Western Manitoba.

PRICKLY LETTUCE (*Lactuca scariola*. L.)

The "Prickly Lettuce," described in the following extract has not yet reached Manitoba, but is reported from Okanagan, B.C. As it is, therefore, not at all unlikely it may be found here in the near future, we print it in full, on the principle that to be fore warned is to be fore armed. The extract is from Bulletin No. 28 of the United States Department of Agriculture, by Mr. Dewey:—



PRICKLY LETTUCE. Fig. 10.

"The Prickly Lettuce is also known by the common names Milk Thistle, English Thistle and Compass Plant. During the past season it has been mistaken for Russian Thistle in many localities. It is a native of Europe. The first record we have of it in this country is in the fifth edition of Gray's Manual (1868), where the locality is given as 'waste grounds and roadsides, Cambridge, Mass.' About ten years later it was observed in the region of the Great Lakes, and now it has become widely distributed throughout nearly all the States from Massachusetts to Virginia and westward to the Missouri River, and has crossed the mountains

to Idaho, Oregon and Washington. It is most abundant and troublesome in the States bordering on the Ohio River and the Great Lakes.

"The Prickly Lettuce is closely related to the common garden lettuce, which it resembles in the seed-bearing stage (fig. 9 a.) It is an annual, sometimes doubtless a winter annual, partaking of the character of a biennial. The stem, smooth or with small scattered prickles, rises to a height of 2 to 6 feet, bearing a few lateral branches and a large open panicle of flowers. The flowers are small, one-fourth to one-half inch in diameter, yellow, and inconspicuous, as only a few are open at a time (fig. 10 d shows natural size of head). The plants begin to bloom in July and produce a few blossoms each morning thereafter until killed by the frost. The seed, or strictly speaking the akene—the seed with the close fitting case which contains it—is dark brown in color, flattened, between oblong and lance-shaped in outline, about one-sixth of an inch long and one-fourth as broad. On each of the flat faces there are 5 or 6 ridges lengthwise, which are finely roughened. At the apex is a slender, thread-like beak, nearly as long as the body of the akene, bearing a tuft of fine white hairs about as long as itself (fig. 10 c). In the fruiting stage the tufts of the 10 to 5 seeds which grow in one head spread out so as to form a white, gauzy ball of down, like that of the dandelion, but smaller and less dense. A single average plant has been estimated to bear more than 8,000 seeds. The leaves are oblong and without stalk, the blade clasping the main stem by a base with two ears. They are prickly along the wavy margins and along the midrib on the back (fig. 10 b). The principal leaves on the stem have the unusual habit of twisting so that the upper part of the blade becomes vertical. They also point north and south; hence the name Compass Plant. The white, milky juice has suggested the name Milk Thistle. Both of these names are incorrectly used in this connection as they are properly applied to very different plants.

"Unlike most annual weeds, the Prickly Lettuce is very troublesome in meadows and permanent pastures. Clover intended for a seed crop is often entirely ruined. Oats and other spring grain crops suffer more or less damage.

GREAT RAGWEED. HOGWEED (*Ambrosia trifida*, L)

Annual. This is a stout coarse weed, much branched, and from 3 to 5 feet in height. It is found commonly in heavy soil, and is very abundant in grain fields and waste places in many parts of the Province.

The plant is rough, hairy, with large opposite, deeply three-lobed leaves. Fig. 11 a.

The flowers are of two kinds, growing on different parts of the plant. The sterile or male flowers are produced in tapering spikes about four inches in length, and are green above, and a dull yellow beneath. The fertile or female flowers grow from one to three together at the bases of the spikes and leaves, close to the stem. As they are of a greenish color and inconspicuous they are not often noticed. They each produce a tapering seed from $\frac{1}{4}$ in. to $\frac{3}{8}$ in. in length, with curious horn-like projections at the broad end, (fig. 11 b.) They ripen in September and October.

Owing to its coarse growth this weed is a great nuisance, choking and starving the crops; and adding greatly to the labor of harvesting.

Still greater mischief is caused by the seeds, which cannot be cleaned



GREAT RAGWEED (*Ambrosia trifida*, L) Fig 11.

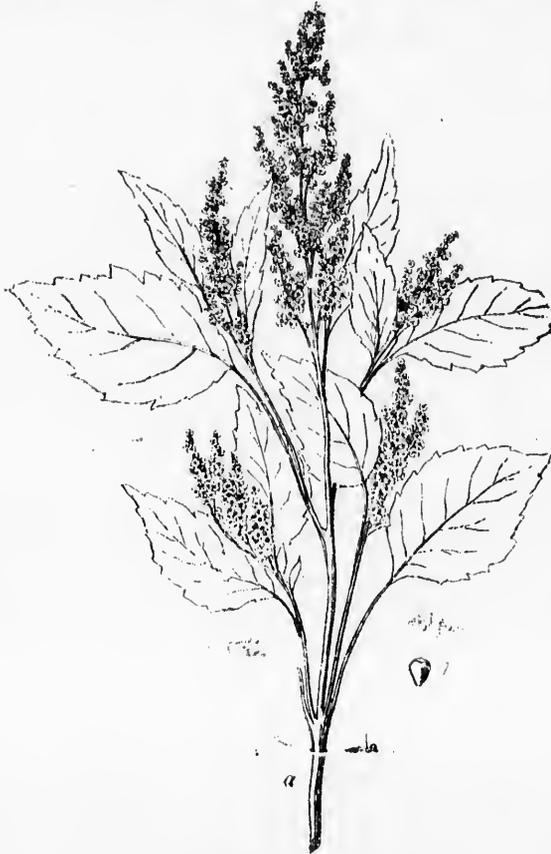
out of grain, and are such a nuisance to millers that wheat or oats containing any large proportion of these seeds, are unsaleable.

The same remark applies to the seed of the following plant.

ROMAN WORMWOOD OR BITTER-WEED (*Ambrosia artemisiifolia*, L).

This plant belongs to the same family as the preceding. It is however less coarse and robust, and grows only to the height of 1 to 3 feet. The flowers are of two kinds, as in the preceding plant; the sterile in long spikes of small green and yellow clusters, and the fertile generally at the base of the leaves. The seeds are much like the one shown in figure 11 *b*; but are somewhat smaller than those of the great Ragweed. The leaves are cut into somewhat fine divisions, rather like those of Wormwood. Hence its common name.

The remedy for it, as for others of its class, is clean cultivation and heavy cropping.



MARSH ELDER Fig. 12.

MARSH ELDER (*Iva xanthifolia*, Nutt).

Annual. This is a well-known weed, common everywhere. It is a

coarse, rough plant, from three to six feet in height. The leaves are mostly opposite, ovate or heart-shaped, somewhat downy, and the margins are cut into teeth, and obscure lobes. The flowers are greenish-white in color, the small heads forming spikes or clusters arranged loosely on the sides or ends of the branches. As in Great Ragweed they are of two kinds, but in this case grow in the same heads. The plant flowers late in summer, and the seeds, which are somewhat pear-shaped, fig. 12 *b*, are produced in the centre of the small heads, ripening in September and October. It is found in fields, gardens, wastes and farm yards, and from its height and rank growth works serious injury to all crops, and adds much to the cost and labor of harvesting. It is often allowed to take possession of the farm yard, neglected corners and borders of fields, and the land thus quickly becomes infested. It should be ruthlessly destroyed by the prevention of seeding.

CANADA THISTLE (*Cnicus arvensis*. Hoffm).

Perennial. This weed partakes largely of the nature of all thistles, it grows to a height of 1 to 3 feet. The leaves are long and narrow. Their edges are not straight but are indented a third to a half way in to the midrib; and the lobes thus formed are turned down at the points, giving the leaf a crimped appearance. The under surface of the leaf is woolly; the upper surface is usually smoother, but is not always without hair or wool of some sort. Prickles occur along the edges of the leaves and on the main stem. The flower is about $\frac{1}{2}$ or $\frac{3}{4}$ of an inch across the top and is perhaps an inch and a half long. It is of a purplish color, and is similar to that of other thistles except that it is smaller and does not present so plump an appearance. When the seed is ripe it can be carried long distance by the wind on account of the down attached to it.

"The Canada Thistle also spreads from the root. It sends rootstocks long distances, horizontally, under the surface and from these, throughout their entire length, spring fresh plants. The thistle is one of the worst of weeds. No crop can grow where it is in full strength, and it renders the handling of the grain in harvest and threshing time a very disagreeable matter. It is extremely hard to eradicate when once it has got a foot-hold on the land, so the farmer should fight it at its first appearance."

PERENNIAL SOWTHISTLE (*Sonchus arvensis*, L)

This exceedingly troublesome pest, was first noticed in Manitoba in 1895, when a vigorous plant of it was found at Cartwright. Every effort was made to have it destroyed, but reports now show that the plant is found in other parts of the province. It is illustrated in Fig. 13.

It is a perennial, with strong long rootstocks, which send up rank coarse stems, with deeply-cut, spiny toothed leaves, clasping them by their bases. The flower stalks and lower part of the flower heads are bristly, making it a very disagreeable plant to handle.

The flowers are in large heads, bright yellow, and produce quantities of downy seed, which like that of the thistle, is carried about by the wind. As the plant grows faster than the young grain, it should be carefully looked for early in the season, and by thoroughly clearing out both plant and rootstock, every effort should be made to eradicate it. This is a very serious pest when once it gains a foot hold. Its coarse rank lower leaves choke out the life from seedlings around it, and draw immense quantities of water from the soil, it produces seeds in great profusion which not only cause it to spread with great rapidity, but become, it is said, a great nuisance to threshers, who are obliged to wear veils to protect their eyes from particles of the floating down.

COMMON SOWTHISTLE (*Sonchus oleraceus*, L.)

This plant and the Spiny-leaved Sowthistle (*Sonchus asper*) are annuals, instead of perennials, and less difficult to control than the preceding. They are, however, sufficiently troublesome and should be kept in check. They are not so large and coarse as the above, have pale yellow flowers, and are very common in gardens as well as fields. They differ from each other principally in their leaves, those of the last named being less divided and more spiny-toothed than those of the former plant, *Sonchus oleraceus*.

PRAIRIE THISTLE (*Cnicus undulatus*, Gray).

This handsome native thistle scarcely needs any description. Its white woolly leaves and stems, and pale purple heads of flowers make it a conspicuous object on the prairie. It is another example of a native plant becoming a nuisance in gardens and fields, where having all the advantages of a cultivated soil, it grows with wonderful vigor and persistency. Under these conditions, as a biennial, it sends out far-reaching rootstocks which send up new plants at intervals, thus enabling it to spread more rapidly. On neglected farms it is likely to prove very troublesome.

WHITE WEED, OX-EYE DAISY, (*Chrysanthemum Leucanthemum*, L.)

The Ox-Eye Daisy is a well known pest in parts of Ontario and southward, where whole farms are seriously injured by it. It was mentioned in our list, in the Bulletin of last year, as having been found in Manitoba, but special attention was not drawn to it, as there was some hope that it might not be very widespread. Now, however, we find it has appeared in Western Manitoba, near Melita, and at other points. The plant is almost too well known to need description. It has finely-cut leaves, rather pale green in color, and handsome white-rayed flowers with a golden eye like a large daisy. It produces abundance of seed. It is a *perennial* and can best be exterminated by pulling. It is to be hoped it will not be allowed to obtain a foothold in this country, and no considerations of beauty should be allowed to interfere with its destruction wherever it appears. Wherever it has been neglected it has become a most pernicious pest in fields, pastures and meadows alike, as it is propagated by creeping rootstocks as well as by seed. The remedy for it is mowing in pastures, etc., and pulling or hoeing among crops.

FIREWEED—CANADA FLEA-BANE, (*Erigeron Canadensis*, Linn.)

An annual, erect and slender from 1 to 4 ft. high, with leaves 1 to 3 in. long and the flowers in numerous small whitish heads about one-sixth



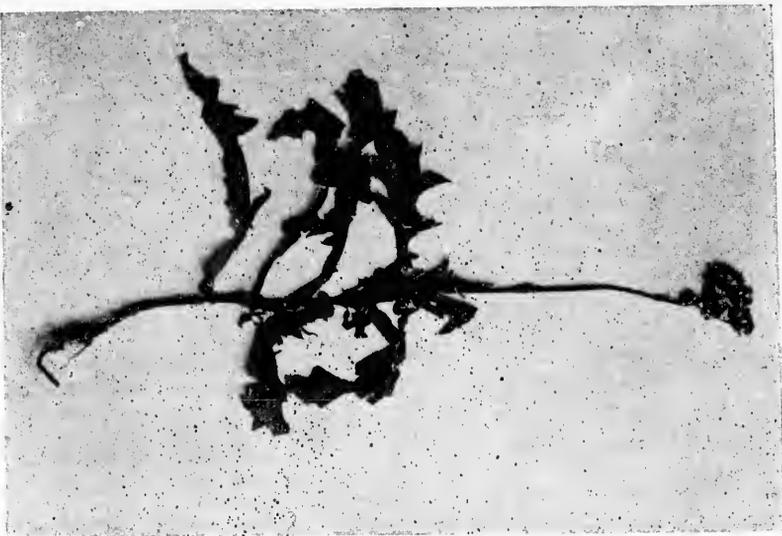
COW HERB. Fig. 14. (*Saponaria vaccaria*, L.)

inch long. These produce numerous seeds, each with a tuft of silky hairs, which enable it to float in the air. As a weed it spreads very quickly on all soils, but especially on such as are wet. It is very common round barnyards and neglected fields. It was very abundant in some parts last year. The proper treatment for its destruction is given in the table at the end.

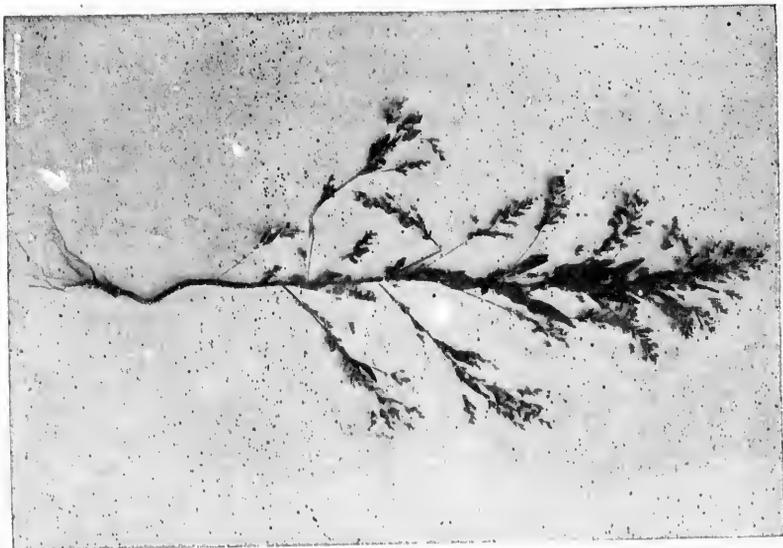
m.)

1 to 3 in.
one-sixth

PERENNIAL SOWTHISTLE (*Conchus arvensis*) Fig. 18
See page 22 for description



RUSSIAN PIGWEED (*Azpis Amaranthoides*) Fig. 17
See page 30 for description



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FALSE TANSY. (*Artemisia biennis*, Willdenow.)

Properly called Biennial Wormwood. This weed is a very common object in grain fields, with its dark-green foliage, and tapering summit growing to the height of 3 feet. Its leaves are finely cut, and the small greenish heads of flowers are closely crowded on short spikes rising from the bases of the leaves. The seeds are small and not usually noticed. As the proper name implies it is a biennial, and like other of its class it requires to be carefully watched in the fall. When detected overtopping the crop, as is often the case, it must be pulled by hand, and every effort made to get rid of it, as its strong coarse growth renders it very injurious to crops. It is also a great nuisance in harvesting.

COW HERB (*Saponaria Vaccaria*, L.)

Illustrated in Fig. 14. An annual, about 2 ft. high with smooth leaves and stems, the latter somewhat swollen at the points, and the whole plant of a light green color. Flowers pink, the calyx or cup having 5 angles, the petals are 5, the outer edges irregularly cut. The seeds contained in a roundish capsule or pod, are black and round. It flowers about the end of June. It is of much the same nature as the cockle and has of late earned a bad reputation for itself. Last year it was particularly bad in parts of Southern Manitoba, where it could be traced by its flowers through whole fields of grain.

The remedy is to pull whenever possible, and treat as other annuals.

STICKY COCKLE (*Silene noctiflora*, Linn.)

This is a plant not unlike Common Cockle in general appearance, but with somewhat heavier foliage, which is covered with hairs secreting a sticky fluid, making it disagreeable to handle. The flower is small and white and opens only at night or on dark days. It is an annual. It is rather a *weedy plant* than a *weed* with us, though in the United States it is listed as a bad weed. It is injurious to grain crops and gardens.

CHICKWEED (*Stellaria media*, Linn.)

Annual. A soft tender plant from a few inches to one foot high, with opposite leaves about $\frac{1}{2}$ in. long. The flowers, like little white stars, spring in twos or threes from the bases of the leaves, and produce roundish pods full of very fine seeds. These pods when green are, in England, eaten greedily by birds—whence no doubt the name Chickweed. With us the only birds noticed eating it were pigeons.

The immense number of seeds enables the plant to reproduce itself in great profusion, and it forms a thick tangled mass which soon chokes the life out of most other plants about it. It grows specially well in wet soils, or in rainy seasons, and there are instances recorded of its having quite destroyed gardens under such conditions. The weed is found in most parts of the province, and will probably become as common as it is in England. It will most likely prove most troublesome in gardens, where it will require vigorous treatment, but under certain conditions it may become a nuisance on the farm.

CARRAWAY (*Carum Carui*. Linn.)

This plant is the garden Carraway perhaps introduced by early settlers for the sake of its seeds, and escaped from cultivation. It has now become a pest in certain parts of the province, notably in the old Red River parishes. It has a bad record in the United States, where it is a nuisance in both pastures, meadows and grain fields. Here it is as yet confined to pastures, yards and gardens, where it is an unsightly weed, as well as destructive to other plants. It is a biennial with a long whitish taproot, much like the parsnip, to which it is nearly related. It bears a large flat head or umbel of pure white flowers. The leaves are thin and finely cut, somewhat resembling those of the carrot. The seeds which are very numerous, are of course the same as those sold for cooking purposes.

It must be dealt with as directed under biennials.

GOLDEN CORYDALIS, OR FUMITORY (*Corydalis aurea*, Willd.)

This is another example of a native plant under certain conditions becoming a weed. During the past year, favored no doubt by the wet season the Golden Fumitory made such a rank growth that it worked injury to crops. This was the case for instance at Neepawa, from which point specimens were sent in for identification by Mr. G. Greig, of the Farmers' Advocate. It is a low growing biennial plant, of not more than one foot high, with soft stems, finely divided leaves, and golden yellow flowers, $\frac{1}{2}$ in. long, with a spur at the back. The seeds are contained in pods about $\frac{3}{4}$ in. long. The flowers are sometimes called *Cockslops*, which they do not resemble much, except in color.

Careful summer fallowing should keep this plant from becoming a serious nuisance.

WILD ROSE (*Rosa blanda*, Ait.)

There are several varieties of Wild Rose in the Province, which are not readily distinguished, but for the purposes of this work it is sufficient to say there are two kinds. One growing in woods and thickets is tall and stout, and the other is dwarf in habit, less robust in growth, and is found on the open prairie. The latter is the one to which we wish to call particular attention, as already a nuisance in fields in the drier parts of the Province.

It quickly takes possession of neglected fields, and, once there, is very difficult to eradicate. Its underground root-stalks spread rapidly and throw up numerous shoots. They are often dragged about and covered in roughly cultivated fields. Care should be taken to collect and burn roots whenever possible.

SILVER WEED (*Potentilla Anserina*, Linn.)

The homely Silver Weed deserves mention here. It grows almost everywhere, in yards, on roads, in fields and gardens. Its low habit prevents it from being very dangerous. Yet its luxuriant growth and persistency makes it often very troublesome. It is easily known by its feather-like leaves—green above and silver below. The flowers are yellow, otherwise much like strawberry blossoms. The slender runners root like those of the strawberry. The plant is a perennial, and frequently becomes very abundant in poorly cultivated fields, in which it does harm by absorbing the moisture. Pigs are fond of its roots, and often turn up loose pastures in search of them.

WILD BUCKWHEAT, OR BLACK BIND WEED (*Polygonum Convolvulus*, Linn.)

This is a trailing annual weed with triangular leaves. The blossom is so small as to be hardly noticeable, but is of a pinkish hue. The seeds are triangular, black, with a light brown hull, very like the cultivated buckwheat. The seed being a good size is very difficult to clean out of wheat. On account of its size it will germinate even if 3 inches from the surface, and can thus be more easily sprouted than some smaller seeds.

Bind Weed (or Wild Morning Glory) much resembles Wild Buckwheat, but the leaf is more pointed and the flowers are large, white or pinkish like the Morning Glory, and the root-stalks are large white, form a network in the soil, and go down to a considerable depth.

RUSSIAN THISTLE (*Salsola Kali var tragus*, L.)

During the year 1896 the progress of this weed has been carefully watched. The infested district has been personally inspected by Dr. Jas. Fletcher, and the Rev. W. A. Burman, as also by the officials of the Department; and a careful study has been made of its character and habits. The facts observed, and the conclusions arrived at, are in the main those set forth in the last Bulletin. Some further data has been gathered as to the extent to which it really damages crops, and as to the conditions which are favorable to its spread. The plant is an annual, at first quite soft and tender, with round green, pointed leaves, as shown in fig. 15 a. It appears about the end of May, grows rather slowly through June, by the end of which month, the points of the leaves have become sharp hard spines. This latter feature is a sure mark of difference from "Scablite," mentioned below. As the plants mature the small leaf-like fracts at the bases of the leaves, become stiff thorns, and the whole plant becomes a dense mass of spines. Fig 16 shows a single branch at this stage. The flowers are about one quarter of an inch across, and are almost hidden at the bases of the leaves. The outer parts are rose-colored, and the seed when formed is wrapped up in these, which having become dry paper-like, serve after they are fallen to facilitate the movement of the seeds by the wind.

The first sharp frost kills the plant, and as soon as it becomes thoroughly dry, it may be broken off by the wind and sent rolling over the land, scattering seed as it goes. The seeds are round, tapering, and with a flat face, about 1-16 in. in diameter. Fig. 15 b.



RUSSIAN THISTLE (*Salsola Kali* var. *tragus*, L.) Fig. 15 .
(a) Young Plant (b) Seed.

The harsh spiny character of the mature plant is so marked that it cannot be mistaken by anyone, with the above description before him. It is this feature which makes it worse than even thistles, to those who have to handle crops in which it has been abundant. The rigid spines will pierce leathern mitts, and severely wound the legs of horses. This fact has earned for it its common name. It is not, however, a thistle a

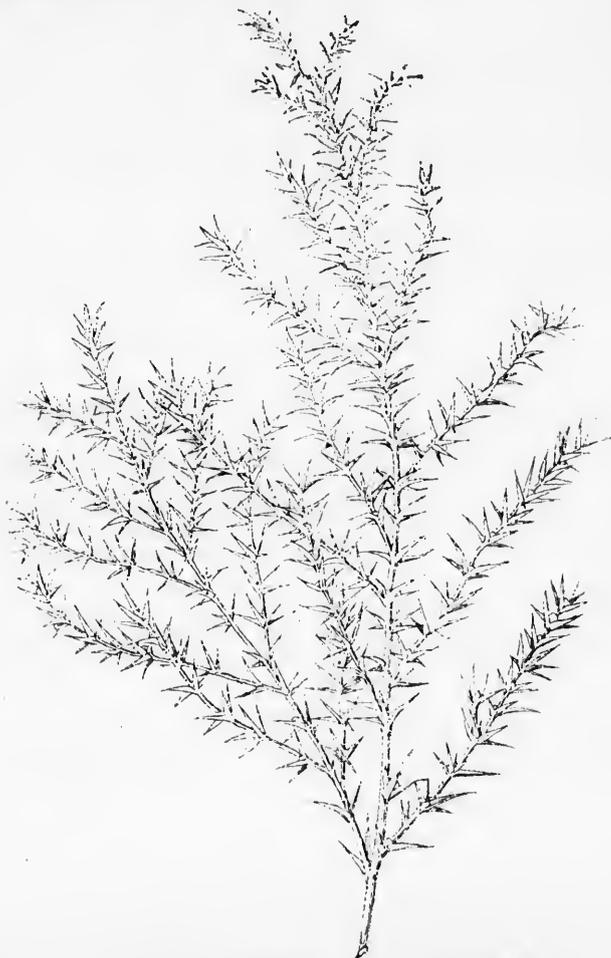
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ordinarily understood. The following facts seem worthy of special notice on account of their practical value:

1. The plant is an annual, produced from seed only, and therefore is to be treated as in the directions for the eradication of annuals. Let special attention be paid to the prevention of seeding.



RUSSIAN THISTLE. Fig. 16. Mature plant.

2. It is probably a native of the sea shore—and so grows best on sandy land. It is doubtful if it would be as dangerous on heavy loam, as it has proved to be on light warm soils.

3. It is not specially dangerous to early crops, except in so far as it robs the soil of moisture, or chokes the younger growth.

4. It is, however, a serious menace to late crops, and to any sown on stubble. The first sharp frost kills the plant but the mischief has already been done, as the seed is generally ripe by the time the plant dries up.

5. With a fair amount of attention to proper cultivation and a strict observance of the "Noxious Weeds Act," there is no reason why Russian Thistle should not be kept in check as well as any other annual.

6. The seeds do not appear to affect the market value of grain, as they are evidently fairly well cleaned out in threshing.

7. In cases where the weed has grown among early crops, it will continue to grow after harvest, throwing out branches from what remains of the stem, and may flower and ripen seed later in the season. Therefore whenever its presence is known the stubble of early crops should be ploughed as soon after harvest as possible.

8. It may be distinguished from Sea Blite (*Suaeda depressa*) in its earlier stages by having sharp pointed leaves which the latter has not. It is also a deeper green in color.

(RUSSIAN PIGWEED *Axyris Amaranthoides*, L.)

This new immigrant has been already referred to under "Weeds and their origin." See fig. 17.

It is a plant closely allied to Lamb's Quarters, and the *Amaranthus* or Pigweed. From the latter it gets its second technical name which means --like the Amaranth. In its young state the plant is very much like Lamb's Quarters, (*Chenopodium album*) but is somewhat velvety to the touch. As it matures it becomes smooth and bald, from which fact it perhaps gets its first name.

It has inconspicuous, tiny, greenish flowers at the base of the leaves many being separate male or female. The latter remain as a covering to the seeds, contained in a roundish somewhat flattened fruit which often continues attached to the plant until spring.

The seeds are dark brown and shaped like very small flax seed. This plant (which is an annual) attains an height of three or four feet, and is profusely branched from near the ground. It is very tough and hard, and remains through the winter, often forming thick tangled masses, through which it is difficult to walk.

It seems to flourish everywhere, but is specially fond of barnyards and roadsides.

As before stated it has probably come to us direct from Russia. It has already got a firm footing in North and South Winnipeg, and has been noticed as far west as Westbourne.

There is some evidence that it kills out Lamb's Quarters, but the vigour which enables it to do that, is no recommendation from the farmer's point of view. It should be regarded as a very dangerous weed.

COUCH GRASS, OR QUICK GRASS (*Agropyrum repens*. Linn)

This is a perennial grass, with a creeping rootstock, by means of which it spreads very rapidly. There are two varieties in Manitoba, namely the one named above, and *Agropyrum glaucum* R. & S. var *occidentale* V. The latter has been called Colorado Blue-stem.

The rootstocks do not penetrate far into the soil, so that deep plowing is not at all likely to eradicate them, but the opposite, as they are thus planted deeper than ever, to come up when least expected. Constant hoeing has been found sufficient to destroy it in one season on light soils. Mr. Fletcher says, "A practice frequently recommended at Farmers' Institute is the following, which although I have never tried it would to my mind certainly succeed :—

"Plow lightly about four inches deep in autumn, and cross plow in spring. In June sow with buckwheat and plow this under as green manure as soon as it is in flower; then sow again the same crop and plow it in. Follow the next year with a hoed crop."

While in low heavy land this grass is undoubtedly troublesome, it is also likely to prove a valuable fodder grass in the West

WILD OATS (*Avena fatua*, L.)

An annual, closely related to the cultivated variety, which it very much resembles, only that the panicle is more straggling and the leaves generally have a more yellow tinge than the latter. The seed has thick brownish hulls, covered at the base with hair, has a long awn much twisted, which uncoils when dampened, whence it sometimes gets the name of "animated oats" in England. The seed may lie in the ground many years without germinating.

WEED SEEDS AND THE MILLING INDUSTRY.

A question worth the serious consideration of farmers is the effect of the presence of weed seeds, upon the market value of grain. It is a matter of such importance that it has been deemed worthy of investigation by the Department. The work is still going on, but some results of the enquiry may be stated now, pending a full report.

First. It seems very clear there is great need of education as to the character and appearance of the seeds of such weeds as are found in grain. Very few farmers, and even grain men, know more than the most notorious seeds. We are informed on credible authority that in one case, a farmer (sic) actually tried to sell a quantity of seeds of stink weed, thinking it was a marketable product. This was in a district where it was not as common as in some parts, and we are informed was offered in good faith to a dealer in flax. This is an extreme case of course, but there is great

need of more general information on this subject. Every man that handles grain at all should know the seeds of every common weed. Next season the Department proposes to form a collection of these for exhibition and examination by interested persons.

Second. Examination of samples of grain and of the cleanings in various mills and elevators reveals a bad state of affairs in respect to threshing. Unprincipled or careless threshers are allowing seeds to remain in grain which ought to be screened out quite easily. This, of course, swells the threshing bill, and is another leak in the farmers' profits.

Dirty grain is often taken to elevators without any attempt at cleaning with a fanning mill, and of course the buyer allows ample margin for this in his price. He has to deduct loss of weight in good grain, cost of transport to market and of cleaning perhaps at some distant point, if he does not do this himself. All this indicates that farmers should insist upon clean threshing. Better pay a trifle more and have the work well done.

Third. Investigation shows that the worst seed in flour and oatmeal mills, is that of the Ragweed. Any variety of this is bad, as they are all much the size of wheat, and though broader than oats, are nearly the same length, but the worst is that of Great Ragweed, which is furnished with several horns at the top, which catch in the meshes of the screens, and can scarcely be separated. So serious is the nuisance that no well informed buyer will purchase milling grains containing any quantity of these seeds at any price. Both the Ogilvie Co. and Mr. Stephen Nairn complain greatly about this pest, and Mr. Fletcher reports the same of the Lake of the Woods Co.

Samples of cleanings obtained from the Ogilvie Milling Co., Mr. S. Nairn, and Body & Noakes have been carefully examined, and the results are given below. They represent of course only the particular lot of grain from which they happened to come, but the examination is still very instructive.

The absence of Ragweed is explained by the fact stated above. Grain containing it is not saleable.

The weeds contained in each sample are given in the order in which they predominate.

1. Ogilvie Co., from wheat the following: Buckwheat, Pigweed, Lamb's Quarter.

2. Mr. S. Nairn, from oats: Mustard, Pepper Grass, Pigweed, Buckwheat, Lamb's Quarter, Ragweed (a few).

3. Body & Noakes, from flax: Buckwheat, Mustard, (probably Hare's Ear,) and Lamb's Quarter.

The above facts are very suggestive, and the Department invites all interested in this important matter to do all in their power to throw light upon it, and to stop as far as possible this serious leakage in the farmers' profits.

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NOXIOUS WEEDS.

Duties of Municipal Clerks, Pathmasters, Overseers, and the General Public.

AN ACT TO PREVENT THE SPREAD OF NOXIOUS WEEDS, AS CONTAINED IN REVISED STATUTES OF MANITOBA, WITH AMENDMENTS.

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of Manitoba, enacts as follows:

1. This Act may be cited as "The Noxious Weeds Act."
2. In this Act, unless the context otherwise requires,—
 - (a) The expression "noxious weeds" includes wild mustard, wild oats, Canada thistles, French weed and Russian thistles, and all other noxious weeds to which this Act may be extended by by-law of any municipality as hereinafter provided.
3. The council of any municipality may by by-law extend the operations of this Act within such municipality to any other weed or weeds which they declare to be noxious to husbandry in the municipality; and all the provisions in this Act shall apply to such noxious weeds as if the same were herein enumerated.
4. Every owner or occupant of land shall cut or cause to be cut down, or otherwise destroyed, all noxious weeds growing thereon, so often in each and every year as is necessary to prevent them going to seed, and if any owner or occupant of land neglect to carry out the provisions of this section, he shall be liable to a fine of not less than five dollars nor more than twenty-five dollars for each such offence.
5. It shall be the duty of each municipal council, not later than the first day of April in each year, to designate by resolution what overseers of highways, pathmasters or other officers shall see to the carrying out of the provisions of the last preceding section.
6. Such resolution shall define the limits of the division within which such overseer, pathmaster or other officer shall exercise his duties in this respect; and such limit shall be so defined that every portion of the municipality shall be included within the jurisdiction of at least one such overseer, pathmaster or other officer.
7. The clerk of the municipality shall transmit a copy of the resolution to the Department of Agriculture and Immigration within one week after its passage. It shall be the duty of each such overseer, pathmaster or other officer to see that the foregoing provisions of this Act are carried out within the division placed under his jurisdiction, by cutting or causing to be cut and destroyed all the noxious weeds growing on the highways or road allowances within the division so placed under his jurisdiction.
8. Should any municipal council fail to carry out the foregoing provisions of this Act by refusing or neglecting to appoint such overseers, pathmasters or other officers, then the Minister of Agriculture and Immigration shall, if, after having given due notice to such municipal council, such notice be not complied with, within one month of its date, appoint some person or persons to fulfill the duties of such overseers, pathmasters or other officers; and shall determine the amount such person or persons shall be paid for such services, which amount shall be paid out of the funds of the municipality as though the appointment had been made by the council thereof.
9. In case any overseer of highways, pathmaster or other officer appointed by the municipal council refuse to act in such capacity, the said council shall forthwith appoint some person to act in his stead; and in default of such appointment being made by such council, the Minister may make the appointment, and may determine the amount which the person he may appoint shall be paid for his services, which amount shall be paid out of the funds of the municipality as though the appointment had been made by the council thereof.
10. Every such overseer, pathmaster or any other officer so appointed shall give notice in writing to the owner or occupant of land within the division of such overseer, pathmaster or officer where noxious weeds are growing, and in danger of going to seed, requiring him to cause the same to be cut down or destroyed within five days from the service of said notice.

11. In case such owner or occupant refuse or neglect to cut down or destroy the said noxious weeds within the period aforesaid, he shall be liable, in addition to the penalty provided in the fourth section herein, to a further penalty of five dollars per day for each and every day on which he neglects to comply with the said notice: and it shall be the duty of such overseer, pathmaster, or other officer so appointed, to take proceedings for the recovery of such penalty; and the said overseer, pathmaster or other officer so appointed shall forthwith enter upon the land and cause such noxious weeds to be cut down, and he shall not be liable to be sued in any action of trespass therefor.

12. Where noxious weeds are growing on non-resident, vacant or unoccupied lands, it shall be the duty of such overseer, pathmaster or other officer to enter upon the said lands and cause the said noxious weeds to be cut down without his being liable to be sued in any action or trespass therefor.

13. Nothing contained in the foregoing sections shall render it necessary that a written notice, as hereinafore referred to, shall be served on the owner or occupant of land on which noxious weeds are growing, before such owner or occupant can be proceeded against for the recovery of the penalty provided in the fourth section of this Act.

14. It shall be the duty of the clerk of any municipality in which railway property is situated to give notice in writing to any stationmaster of the railway, resident in or close to the said municipality, requiring him to cause all the noxious weeds growing upon the property of the railway company, within the limits of the municipality, to be cut down and destroyed, as provided for in the fourth section of this Act. In case such stationmaster refuse or neglect to have the noxious weeds cut down and destroyed within the time specified in the said notice, then the said clerk shall proceed against the stationmaster as if he were the owner of the property, and in the same manner as provided in the fourth section of this Act. And every overseer of highways, pathmaster or other officer so appointed within whose division such property is situated, shall forthwith enter upon such lands as may be within his division, and shall cause the noxious weeds growing thereon to be cut down, and he shall not be liable to be sued in any action of trespass therefor.

15. In order to enable every overseer of highways, pathmaster, or other officer so appointed to effectually carry out the provisions of this Act, the council of every municipality shall in each year provide the treasurer of such municipality with funds to be paid out on the order of such overseer of highways, pathmaster, or other officer so appointed to men employed under the direction of such overseer of highways, pathmaster or other officer so appointed for the purpose of cutting down or destroying noxious weeds; and every such order shall be counter signed by the mayor or reeve of such municipality, or the overseer of highways, pathmaster or other officer so appointed producing proof to such mayor or reeve that the amount stated in the order is correct as to the number of days work done, and that the rate of wages to be paid therefor is not excessive.

16. Every overseer of highways, pathmaster, or other officer so appointed shall keep an accurate account of the expenses incurred by him in carrying out the provisions of the tenth, eleventh, twelfth and fourteenth sections of this Act with respect to each parcel of land entered upon therefor, to which expenses shall be added compensation at the rate of two dollars per day to such overseer of highways, pathmaster or other officer so appointed, for his services in overseeing the work.

17. Such accounts shall be sent in to the clerk of the municipality on the first day of each month next after that in which they were incurred, and the said clerk shall submit them to the council of the municipality.

18. The said council shall cause all such sums as are paid under the provisions of the three last preceding sections to be severally levied on the respective lands described in the statements of the overseers of the highways, pathmasters, or other officers so appointed, and to be collected in the same manner as other taxes; and the same, when collected, shall be paid into the treasury of the municipality to reimburse the outlay therefrom, as aforesaid.

19. Any person who vends for seed or feed purposes any grain, grass or other seed, among which there is any seed of noxious weeds, shall be liable to a fine of not less than ten dollars nor more than one hundred dollars.

20. Any person selling or otherwise disposing of any cleanings or other refuse containing seeds of noxious weeds, from any elevator or mill, without first destroying the germinating qualities of such seed of noxious weeds by grinding or otherwise, shall be liable to a penalty of not less than twenty-five dollars nor more than one hundred dollars.

21. Every municipal clerk, overseer of highways, pathmaster or other officer who refuses or neglects to discharge any of the duties imposed on him by the sections of this Act numbered from five to seventeen, inclusive of both such numbers, shall be liable to a fine of not less than five dollars nor more than one hundred dollars.

22. The Minister of Agriculture and Immigration shall in each year appoint one or more persons as inspector or inspectors of noxious weeds, whose duty it shall be to see that every overseer of highways, path-

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master, or other officer discharges the duties imposed upon him by the sections of this Act numbered from five to seventeen, inclusive of both such numbers; and every such inspector shall, in case the overseer, pathmaster or other officer refuses to carry out such provisions, have and possess all the powers given to such overseer, or pathmaster or other officer herein.

23. Any such inspector may, during the daytime, enter any store, shop, warehouse or other premises occupied by any person who vends grain, grass or other seed for feed or seeding purposes, and may inspect such seeds to ascertain if they contain any seeds of noxious weeds, and may take away a sample of such grain, grass or other seeds if he consider it necessary for the purpose of establishing the fact that seeds of noxious weeds are contained among such grain, grass or other seeds.

24. For the purpose of proceeding under this Act, or under any order or regulation of the Lieutenant Governor in Council, every offence against this Act or against any such order or regulation shall be deemed to have been committed, and every cause of complaint under this Act or against any such order or regulation shall be deemed to have arisen either in the place in which the same actually was committed or arose in any place in which the person charged or complained against happens to be.

25. All prosecutions under this Act may be brought and heard before any police magistrate or justice of the peace; and any police magistrate or justice of the peace shall have power to award payment of costs in addition to the penalty. The penalty, when recovered, shall be paid over by such justice or police magistrate to the Provincial Treasury; and in default of payment, the offender shall, by warrant, signed and sealed by the police magistrate or justice of the peace, be imprisoned for a period of not less than one day nor more than one year; at the discretion of such justice or police magistrate, unless the penalty and costs be sooner paid.

26. No conviction, warrant of commitment, order or any other proceeding, matter or thing made, done or transacted in or relating to the execution of this Act shall be vacated, quashed or set aside for want of form, or for any defect which does not substantially affect the justice of the case, or be removed or removable by *certiorari*, or other writ or process whatsoever, into any superior court.

27. The Lieutenant Governor in Council may from time to time, make such further rules, orders and regulations as may be required for the purpose of effectually carrying out the provisions of this Act; and every such rule, order or regulation shall be read as part of this Act; and shall have the same force and effect as if it had been enacted herein.

28. Whenever any inspector, pathmaster, overseer or other officer is authorized, directed or empowered, or may be authorized, directed or empowered under this Act to cut down, destroy or remove any noxious weeds, this Act and every section thereof in which such authority or direction is referred to, shall be construed to mean that such inspector, pathmaster, overseer or other officer, may, if the premises are occupied, on service of three days notice upon the owner or occupant or upon some grown up person on the premises, or if the premises are unoccupied, then without notice, proceed forthwith to cut down, remove and destroy such noxious weeds, whether the same be growing with and intermingled with a growing crop or not; and such inspector, pathmaster, overseer or other officer may, if he shall deem it necessary, cut down all and every such growing crop, and no action, claim or demand shall lie or be sustained against such inspector, pathmaster, overseer or other officer in respect thereto.

23	Malva	Malva rotundifolia and Malva sylvestris	Menomonee serve	June to Oct.	July to Oct.	White or purple, single	Sticks and root- stocks	Roadsides and neglected gardens in fields, meadows, and gardens	Pulling and thorough cultivation Prevention of seed- ling
24	Wild Parsnip	Pastinaca sativa	do	July to Oct.	Aug. to Oct.	Yellow, 1-4 in. umbel.	do	do	do
25	Caraway	Carum carvi	Red River Valley	July & Aug.	Sept.	White, in flat clusters	Seed, in grain, etc	Fields and roads; etc	Cutting and pull- ing Prevention of seed- ling and burning
26	Canada, Fleashane	Erigeron Canadensis	do	July to Sept.	Sept. and Oc.	Green, 1-4 in. in heads	Seeds	Fields and wa. tes; grain, etc	do
27	Marsh Elder	Ira xanthifolia	do	do	do	Yellow, heads forming racemes	Seeds	do	do
28	Ragweed	Ambrosia trifida	do	do	do	Yellow, 1-4 in. in head- green, 1-8 in. in head-	do	Fields, wastes, etc; crops and wood	Prevention of seed ling and cultivn
29	Roman Wormwood	Xanthium strumarium	Man., in many places	do	do	Yellow, 2 to 3 in. do	do	Fields, wastes, etc	do
30	Cockle Bur	Helianthus scirtus	Common	July to Sept.	do	do	do	do	do
31	Sandflower	Nuttallii	do	do	do	do	do	do	do
32	Sunflower (Nuttall's)	Achillea Millefolium	do	do	do	White or rose 1-8 in. do	Seeds, by root- stocks	Fields and gardens	Prevention of seed ling, cultivation, and hand-pulling
33	Yarrow, or Milfoil	Chrysanthemum Leucanthemum	do	July & Aug.	Aug. and Sep.	White, yellow centre, 1 in. in heads	do	Fields and wa. tes; crops	Prevention of seed ling and burning
34	One-eye Daisy, Marguerite,	Arenaria dracunculifolia	Spreading near Winnipeg	do	do	Greenish, 1-1/2 in. in single heads	do	do	do
35	Wormwood	Arenaria dracunculifolia	Throughout Man.	do	do	Greenish, 1-1/2 in. in single heads	do	Fields and wastes; do and hay	do
36	Biennial Wormwood or False Thaisy	Artemisia biennis	do	do	do	Greenish, 1-1/2 in. heads small in short spike	do	Fields and wastes; crops	do
37	Sage Brush	" frigidula	do	do	do	Silvery, 1-1/2 in. in round heads forming racemes	do	do	do
38	Canada Thistle	Cnicus arvensis	Man., East and Central	do	July to Oct.	Purple heads, 1-2 in.	Sticks; by root- stock	Fields, etc.; a l; crops	Alternate cultivation and heavy cropping
39	Prairie Thistle	Cnicus undulatus	do	June to Sept.	July to Oct.	Purple heads, 1-2 in.	Carried by wind	Fields, pastures, grain, etc	Prevention of seed ling and burning
40	Showy Lettuce	Mulzedium pulchellum	Throughout Man.	do	do	Blue, heads 3-4 in.	Seeds; wind	do	do
41	Spiny Southistle	" cum Sonicus asper	do	do	do	Pale yellow, heads 1-2 in.	do	do	do
42	Field, or Perennial Sow thistle	" arvensis	Found lately in Southern Man.	do	do	Bright yellow, heads 1- to 2 in	Seeds, by wind and rootstocks	do	Thorough cultivation and smothering
43	Burdock	Lactuca taraxacum	Everywhere	May to Oct.	June to Nov.	Yellow heads, 1 in.	Seeds carried by wind	Meadows, pastures lawns, etc.; crops	Prevention of seedling
44	Cumweed	Grindelia squarrosa	Throughout Man.	Aug. and Sep.	Sept. and Oct.	Bright yellow, head 3-4 in	Seeds; wind, etc	Fields, etc.	Prevention of seedling
45	Beggars Ticks	Bidens frondosa	Southern Man., Man.	July to Sept.	Aug. to Oct.	Yellow heads, 1-4 in.	Seeds carried by animals	Moist soil, pas- tures, etc	Prevention of seedling
46	Sea Milk-wort	Glaux maritima	Do. on wet lands	July	August	Purplish, bell shaped, 1-1/2 in	Seeds as root- stocks	Meadows and wet fields; crops and hay	do
47	Blue Bur	Echinopspermum Lappula	Everywhere in Man.	July to Sept.	Aug. and Sep.	Blue, 1-3 in., raceme	Seeds, on coats of animals	Everywhere; all crops	Sow clean see cultivation
48	Bindweed	Convolvulus sepium	do	do	do	White, funnel-shaped, 1-1/2 in	Seeds and root- stocks	do	Prevention of seedling

TABLE OF WEEDS—Continued.

Common Name.	Technical Name.	Where Injurious	Duration	Time of Flowering	Time of Seeding	Color, Size and Arrangement of Flowers	Methods of Propagation and Distribution of Seeds.	Place of Growth and Products Injured	Methods of Eradication.
49 Wild Rose.....	Rosa blanda.....	Specially W. Man.	do	August.....	October.....	Rose.....	do	Fields and gardens.	Thorough cultivation
50 Silverweed.....	Potentilla anserina.....	Everywhere.....	Perennial.....	May to Oct.	June to Oct.	Yellow, 1-2 in. solitary.	do	Fields, and gar.	Thorough cultivation
51 Evening Primrose.....	Oenothera biennis.....	Everywhere.....	Biennial.....	June to Aug.	Sept & Oct.	Yellow, in long spikes, 1 to 2 in. across.	Seeds carried by wind	Light land, meadows, grain	Summer fallow and pulling
52 White Stemmed Primrose.....	Oenothera albicaulis.....	Common.....	do	do	do	White, solitary, 1-2 in. across.	do	do	do
53 Three-flowered Nigella.....	Solanum triflorum.....	Everywhere.....	Annual.....	July to Sept.	Sept. and Oct.	White, 1-2 in. in threes.	Seeds.....	Fields and gardens.	Prevention of seeding
54 Nettle.....	Urtica gracilis.....	do	Perennial.....	July to Sept.	Aug and Sept.	Green, 1-12 in., in long panicles.	Roots, etc., seeds	Wet lands, crops and hay	Mowing in July and Aug., burning
55 Wolf Willow Show berry.....	Symphoricarpos albidensis.....	do	do shrub	summer.....	Oct.....	Pink, 3-8 in. in clusters.	carried by birds	All lands, crops, gardens etc.	Plowing up and burning
56 Dogbane.....	Apocynum androsaemifolium.....	Common especially westward.	Perennial.....	July to Aug.	Aug to Sept.	Rose color, 3-8 in. open clusters	Rootstocks and seeds	Fields and prairie, a nuisance in crops.	Mowing and cultivation
57 Greater Plantain.....	Plantago major.....	do	Perennial.....	July to Oct.	Aug. to Oct.	White, 1-16 in. spike.	Seeds and root-stems	do	Thorough cultivation
58 Figweed.....	Amaranthus retroflexus.....	do	Annual.....	do	do	Green, 1-16 in. spike.	Seeds; wind.	do	Thorough cultivation
59 Tumbleweed.....	Amaranthus albus.....	do	do	do	do	Green, 1-16 in. spike.	do	do	Prevention of seeding
60 Russian Figweed.....	Amaranthus hybridus.....	Central Man.	do	do	do	Green and yellow 1-16 in. in pairs	do	do	Burning and prevention of seeding
61 Lamb's Quarters.....	Chenopodium album.....	Everywhere.....	Annual.....	July to Sept.	Aug to Oct.	do	Seeds; wind.	Waste places and gardens; veget.	do
62 Maple-leaved Goosefoot.....	do	do	do	do	do	do	do	Waste places and gardens; veget.	do
63 Oak-leaved Goosefoot.....	do	do	do	do	do	do	do	Waste places, fields etc.; vegetables	do
64 (Atriplex) no English name.....	Atriplex patula var. ha-tata.....	Round Winnipeg.	do	do	do	do	do	Waste places and gardens; veget.	do
65 (Kochia) ".....	Kochia scoparia.....	Red River Valley, etc.	do	do	do	Green, 1-16 in. clusters	do	do	do
66 Russian Thistle.....	Salsola kali var. tricuspidata.....	Southern Man.	do	do	do	Purple, 1-4 in. solitary clusters	do	do	Burning and cultivation
67 Knotgrass, Pigweed.....	Polygonum aviculare.....	Everywhere.....	do	June to Sept.	July to Sept.	Greenish-white, 1-4 in. clusters	do	Everywhere; crops, gardens, etc.	Burning; sow etc. n seed
68 Wild Buckwheat.....	" convolvulus.....	do	do	do	do	White, 1-4 in. raceme.	Seeds, in grain	Grain fields	do

do wind Gardens, etc. Cultivation

do wind Gardens, etc. Cultivation

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69 Spurgedo	Aug to Sept	Aug & Sept	Reddish, 1.16 in., clas- ters	do wind	Gardens, etc	Cultivation
70 Wild Oats .....	.....do	July to Sept	do	Green, 2.4 in., panicle.	Seeds, in seed grain	Fields, grain crops	Burning; clean seed
71 Barnyard Grass .....	.....do	do	do	Green, 1.8 in., panicle.	.....do	Farm yards; gra- dens	Prevention of seedling
72 Couch Grass .....	.....do	Perennial	do	Green, 1.8 in., spikes	Seeds and root stocks	Fields: all crops except hay	Heavy cropping Prevention of seedling
73 Skunk-tail Grass .....	.....do	Annual	Aug to Oct	.....do	Seeds, wind, an- imals	Meadows; hay	.....do
74 Squirrel-tail Grass .....	.....do	do	do	.....do	.....do	Cultivated ground	.....do
75 Spear Grass	Common	do	Aug and Sep	Grass, seeds with long awns	.....do	Dry pastures, troublesome to animals	Early mowing by animals and in hay

