A2ALA 9
2 W21

RL 823

2 ALA 9 1912W21
eds Of Alberta - Bulletin No.1.
1
3 3398 00128 8595

PROVINCE OF ALBERTA

MENT OF AGRICULTURE

SEED AND WEED BRANCH

LEGISLATIVE LIBRARY
JUL 20 1976
EDMONTON

BULLETIN No. 1.

WEEDS OF ALBERTA

PUBLISHED BY THE DIRECTION OF THE

HON. DUNCAN MARSHALL, MINISTER OF AGRICULTURE

LIBRARY
VAULT 19

EDMONTON:
JAS. E. RICHARDS, GOVERNMENT PRINTER
1912

Digitized by the Internet Archive
in 2019 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

PROVINCE OF ALBERTA

DEPARTMENT OF AGRICULTURE

SEED AND WEED BRANCH

BULLETIN No. 1.

WEEDS OF ALBERTA

PUBLISHED BY THE DIRECTION OF THE

HON. DUNCAN MARSHALL, MINISTER OF AGRICULTURE

EDMONTON:
JAS. E. RICHARDS, GOVERNMENT PRINTER
1912

WEEDS OF ALBERTA

BULLETIN NO. 1

SEED AND WEED BRANCH

DEPARTMENT OF AGRICULTURE

PROVINCE OF ALBERTA

HON. DUNCAN MARSHALL, MINISTER OF AGRICULTURE

PUBLISHED BY THE DIRECTION OF THE

HONOURABLE DUNCAN MARSHALL,
Minister of Agriculture,
EDMONTON.

SIR,—

I have the honour to submit herewith Bulletin No. 1 of the Seed and Weed Branch, entitled "Weeds of Alberta," by C. E. Lewis, B.A., B.S.A., formerly Chief Weed Inspector of the Province and now Superintendent of Fairs and Institutes, and Angus McKenney, B.S.A., Superintendent of the Seed and Weed Branch of the Department, and to recommend that it be published for general distribution.

I have the honour to be, Sir,

Your obedient Servant,

GEORGE HARCOURT,
Deputy Minister.

DEPARTMENT OF AGRICULTURE,
EDMONTON, MAY 15TH, 1912.

ACKNOWLEDGMENTS

In the preparation of this Bulletin, the authors are indebted to T. N. Willing, A. Mitchell, the late T. B. R. Henderson, previous Chief Weed Inspectors, for much valuable information collected by them regarding the classification and methods of controlling many of the weeds found in this province. Valuable assistance was also rendered by the various local weed inspectors. Frequent reference has also been made to that excellent and exhaustive work "Farm Weeds of Canada," by George H. Clark, Seed Commissioner, Ottawa.

The illustrations used in this bulletin were drawn by A. W. Wheeler, Edmonton, Alberta.

A FOREWORD

THE MENACE OF WEEDS.

Many farmers wonder why weeds are so much more troublesome in the prairie provinces than in the older settled ones to the east; why there are such stringent laws providing for their destruction; and why the Government sends out inspectors to see that the provisions of The Noxious Weeds Act are enforced. The answer to these queries is best explained by reference to the following table, which gives the average annual precipitation (snowfall being converted into its equivalent in rain) per month and year at nine different points in the province for a period of seven years—1903 to 1909, inclusive:

TABLE SHOWING ANNUAL PRECIPITATION FOR SEVEN YEARS 1903–1909.

	Medicine Hat	Lethbridge	Macleod	Pincher Creek	Calgary	Gleichen	Three Hills	Wetaskiwin	Edmonton	Prov. Average
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
January	0.43	0.72	0.56	0.80	0.33	0.29	0.71	0.86	0.96	0.62
February	0.31	0.47	0.28	0.46	0.28	0.23	0.44	0.72	0.55	0.41
March	0.46	0.72	1.05	0.71	0.74	0.27	0.67	0.99	0.86	0.72
April	0.32	0.84	0.85	2.09	0.80	0.49	0.52	0.50	0.63	0.78
May	**2.37**	**3.35**	**2.83**	**3.86**	**3.62**	**2.82**	**2.51**	**1.59**	**1.74**	**2.80**
June	**2.09**	**2.83**	**3.40**	**1.91**	**3.61**	**4.04**	**3.89**	**4.03**	**3.97**	**3.53**
July	**1.14**	**1.27**	**1.39**	**3.63**	**2.08**	**2.49**	**1.99**	**3.07**	**3.00**	**2.28**
August	**1.11**	**2.07**	**1.44**	**2.27**	**2.94**	**2.36**	**2.23**	**2.00**	**2.21**	**2.17**
September	0.50	1.08	0.80	0.87	0.90	0.50	0.93	1.25	1.05	0.97
October	0.41	0.81	0.49	0.62	0.56	0.67	0.66	0.50	1.02	0.66
November	0.26	0.50	0.44	0.43	0.38	0.25	0.50	0.78	0.92	0.50
December	0.42	0.47	0.43	0.20	0.22	0.24	0.66	0.79	0.57	0.51
Totals	9.82	15.13	13.96	17.85	16.46	14.65	15.71	17.08	17.48	15.95

Annual Precipitation of —	Ontario	Average 26 years	31.62
	New York State	Average 23 years	27.80
	Missouri	Normal	40.71
	Iowa	Average 19 years	31.71
	Ohio	Average 21 years	39.20
	Alberta	Average 7 years	15.95

Note that the largest amount of rain comes during the growing months, and that when harvesting and threshing come on the rainfall is very light. This gives the ideal conditions all like to see for harvesting and threshing. It is these conditions which enable the prairie provinces to handle large areas of grain without housing in barns.

While the above mentioned weather conditions are ideal for handling grain, they are also ideal for the preservation of weed seeds. In an average of years sufficient moisture does not fall after harvest begins to cause the weed seeds to swell and germinate so that they may be killed later by the winter's frosts. They lie on the surface

of the ground unharmed during the fall and winter ready to start growth the minute favourable conditions present themselves the following spring.

The same weather conditions explain in a very large measure what is called a "volunteer" crop of grain. The grain shelled on the ground during harvesting has not been injured during the fall and winter, and is ready to grow in the spring. This can only be possible where dry conditions prevail. If the weather conditions are such that the comparatively exposed germ of grain can come through the fall and winter without being destroyed, how much more likely it is that weed seeds with their germ protected by heavy oily coatings can come through without injury. With this thought in mind it is easy to understand that plowing down weed seeds in the fall only tends to preserve them if they have not first been sprouted. It is because of the difficulty of getting weed seeds sprouted in the fall before plowing that farmers are advised to disc their land immediately after harvest. The discing tends to conserve moisture and greatly assists in destroying weed seeds by making the conditions for their germination more favourable.

The second reason why weeds are so bad is the fact that many farmers are attempting to crop a larger area than they can work properly, thus giving the weeds an excellent opportunity to gain a footing and then spread. A third reason lies in the fact that where wheat follows wheat on the same land, or even oats and barley, similar conditions prevail and a certain class of weeds are bound to obtain a foothold and flourish. This is because the habits of growth of these plants fit into the methods of cultivation, *i.e.*, he weeds have a chance to grow and produce seed during the time no cultivation is taking place. Thus it is easily seen how weeds of similar nature may gain an ascendancy.

In addition to the above there are many minor contributing causes, some local in character. On the open prairie the wind is a wonderfully effective distributing agent, especially for spreading those weeds that have what are called "tumbling" characteristics. Large areas have been infested by the carelessness of one man in allowing his weeds to blow over many miles of country. Then the spread of weeds is wonderfully helped by the exceeding fertility of the soil, because they flourish in fertile soils just as well as cultivated crops.

It is also apparent that the universal implement used in the summer-fallow—the disc harrow—is not the best one for the destruction of those weeds which are deep-rooted. To kill these the broad shared or duck-foot cultivator must be used.

It is for the above reasons that the weed problem is a most serious one—one which if neglected will drive farmers off their lands as it has already done in some prairie districts. Recognizing these things, the legislature of the province has passed a most stringent law covering the destruction of weeds and classed as noxious those which have shown themselves to be most troublesome. The Department of Agriculture, knowing the seriousness of the situation, has continually at work during the summer seasons a large number of weed inspectors who visit all districts of the province in an effort to keep noxious weeds in check. In the past The Weed Act has been weak in that only an inspector could begin prosecution for neglect

to destroy weeds. At the recent session of the legislature this was altered making provision for any farmer to begin prosecution against a neighbour for not destroying his weeds.

The Department has also carried on a vigourous campaign of education in an effort to get farmers to understand the weed problem and its menace. This bulletin is issued in the hope that it will assist in a better understanding of the weed problem. It is a very serious one, but for all, one which is now absolutely under the control of the farmer himself. If the farmer will understand the influence which our rainfall has upon the growth and destruction of weeds, will protect himself against infestation by winds by applying the law to his neighbour, will diversify his cropping so as to give greater opportunity for weed destruction, and will realize the necessity of the situation, he need not fear weeds. The situation is in his hands; he cannot expect the government to keep his land clean, as all it can do is to furnish him with a law giving ample protection. He has that now. The weed question is therefore up to him.

It will stand to the everlasting shame of the farmers of to-day if they allow the fertile soil of this fair province—the last west—to become polluted with noxious weeds.

GEO. HARCOURT,
Deputy Minister.

WEEDS OF ALBERTA

BY

A. McKENNEY, B.S.A.

(*Superintendent of Seed and Weed Branch*),

AND

C. E. LEWIS, B.A., B.S.A.

(*Superintendent of Fairs and Institutes*).

WHAT IS A WEED.

The broadest definition of a weed is "a plant out of place," but for all practical purposes, so far as general farm work is concerned, any plant which greatly reduces the yield or lowers the marketable grade of a crop by drawing moisture and fertility from the land, may rightfully be called a weed.

WHY CERTAIN WEEDS ARE TERMED NOXIOUS.

1. Vigourous growth; weeds of this nature crowd out the crop and absorb large quantities of moisture and fertility.

2. Production of large quantities of seeds; although the vigourous growers may often be easily destroyed, they keep the soil constantly filled with fresh seed.

3. Indestructibility of seed; the covering of certain seeds is so well protected with an oily coating, that it is enabled to remain in the soil for many years and still retain sufficient vitality to germinate when brought to the surface of the soil.

4. Tumbling habits; certain weeds break off readily at the ground and roll over the land with the wind, distributing seeds as they go.

5. Creeping root-stocks; many weeds, such as Perennial Sow Thistle, Canada Thistle, Bindweed, etc., are propagated by means of underground stems as well as by seeds. These rootstocks are difficult to destroy and spread with remarkable rapidity through the soil, sending up new shoots at short intervals, which soon cover the ground and choke out the crop.

METHODS OF DISTRIBUTION.

Most of the noxious weeds found in the province have been introduced from other countries. They have been brought in and distributed in various ways.

1. *By the Wind.*

Weed seeds are carried by the wind in the summer, and by drifting over the snow in winter. The seeds of such weeds as Blue Lettuce, Sow Thistle (annual and perennial), Canada Thistle, and

the Dandelion have tufts of silky hair attached to them, by means of which they are readily conveyed from one place to another by the wind. Many plants on account of their spherical habit of growth and the tendency which they have to break off at the base of the stem such as Tumbling Mustard, Russian Thistle and Tumble Weed, are rolled along the ground by the wind and their seeds distributed in this way.

2. *By Animals.*

Cattle, horses or swine allowed to feed on grain containing weed seeds will distribute the seeds uninjured in their excrement, as the germinating power of weed seeds is not destroyed in passing through the intestines of these animals. Great care should be taken to prevent cattle feeding on screenings left by the threshing machine. These screenings should be burned immediately, or buried so deeply that they will give no trouble.

Many kinds of weed seeds attach themselves by such means as hooked and barbed hairs, spines, gummy secretions, etc., to the hair or wool of passing animals and are thus carried from place to place.

3. *By Water.*

Streams aid greatly in distributing weeds and great care should be taken to keep the banks of streams and irrigation ditches clean.

4. *By Man.*

Man is largely responsible for the distribution of weeds, chiefly through the agency of impure seed, feedstuffs, railroads and farm implements.

Sowing grain that is infested with weed seeds has caused the greatest distribution of weeds. Every farmer should possess a fanning mill and thoroughly clean his seed grain.

Many weeds have been brought to the province in the fodder and litter used by imported stock in transit, and also by railroad contractors importing feed infested with noxious weeds. They thus get a start along the right-of-way and soon spread to neighbouring farms.

Weeds are spread by threshing machines, grain racks and various kinds of farm machinery. Great care should be taken to clean implements when moving from an infested field to one that is clean.

CLASSIFICATION AND ERADICATION.

To exterminate weeds it is necessary to be familiar with the habits of growth of the particular plant to be destroyed, the character of the soil and the state of the weather are also important features to be considered.

Weeds may be considered as belonging to one of the following classes: Annuals, or one year plants; biennials, or two year plants; perennials, or many year plants. The method of eradication depends to a great extent upon the class to which the weed belongs.

Annuals are plants that produce but one crop and then die, and spread only by means of seeds. They usually have small fibrous

roots. Wild Mustard and Lamb's Quarters are examples. Any method of cultivation which will hasten the germination of the seeds and kill the young plants before they produce seed will, if continued, destroy weeds belonging to this class.

Winter annuals are hardy annuals that survive the winter and produce seed early the next summer. They are true annuals when the seed germinates in the spring, but when it germinates in the fall the young plants produced live through the winter and complete their growth the next spring. Tumbling Mustard, Hare's Ear Mustard and Stinkweed are examples of winter annuals.

Biennials are plants that require two seasons to complete their growth and seldom bear seed the first year, but store nutriment in their roots for the production of flowers and seed the next season. Tansy Mustard and Blue Bur are examples of this class. Any system of cultivation which will cut biennials off below the crown will kill them Frequent mowing before they flower will destroy them, but a single mowing only causes the plant to become more branching and if not cut will produce a larger quantity of seed.

Perennials are plants that live for many years and are propagated from seed, and quite often by underground root-stocks. They may be divided into two classes or groups, deep rooted and shallow rooted. Canada Thistle, Perennial Sow Thistle and Blue Lettuce are examples of deep rooted perennials. Couch Grass and Pasture Sage are examples of the second class. Perennials are the most difficult of all weeds to destroy. Improper cultivation wil only tend to increase the number of plants.

To destroy deep rooted perennials, plow deep y, cultivate with a spring tooth cultivator and continue surface cultivation throughout the season with a sharp shared cultivator, every time plants throw up stems. Avoid cultivating land infested with perennials with a disc harrow as it will cut up the roots, thus increasing the number of plants.

To destroy shallow rooted perennials, plow shallow, just deeply enough to go below the roots of the plants and then cultivate thoroughly with a spring tooth cultivator, bringing as many roots as possible to the surface, where they will be dried out by the sun. Continue surface cultivation at frequent intervals to prevent the plants from producing leaves.

In combating perennials it is advisable to let the plants grow until they reach the bud stage and then mow with the mower as close to the ground as possible before ploughing. This first growth of the plant is produced largely by drawing on the store of nourishment in the roots. The plants are then in a weak condition and should be cut before they have had time to replenish the supply of food in the roots of the plant.

SUMMER-FALLOWING.

Summer-fallowing is considered essential in a large portion of Alberta by the most successful grain growers for the purpose of storing the moisture from one year for the production of a crop next season. There are portions of the Province where it is advisable to summer-fallow every alternate year and portions where once in three years is sufficient; and then again there are large areas where

summer-fallowing for the conservation of moisture is not necessary. This is accounted for by the difference in the soil and the variation in rain fall.

The heavy black soil containing a large amount of humus which is found in large areas in Alberta holds moisture much better than where the soil is of a lighter nature. As a rule it is not practicable to summer-fallow this heavy soil as more moisture will be carried over to the next season than the crop will require which will tend to keep the grain growing too late in the fall.

Summer-fallowing is one of the best methods of destroying weeds. The land should be disced just as soon as the grain is harvested to germinate the weed seeds that are on the surface.

Cultivate once or twice in the spring, plough in June and cultivate the land at intervals throughout the summer never allowing the weeds to get so large that the harrow will not destroy them.

Where it is not practicable to summer-fallow, disc the land as soon as the crop is harvested and cultivate again in the spring. Plow in June and seed to green feed cutting the crop before the weeds are ripe.

A crop rotation including green feed and hay as well as the cereal grains will assist very greatly in holding the weeds in check.

SHEEP DESTROY WEEDS.

It is unfortunate that sheep are not kept more generally throughout the Province of Alberta, as they would prove a very important factor in keeping the farms free from weeds. *"When an abundance of succulent pasture of the finer grasses is provided, weeds can scarcely be said to be favoured by sheep as a staple part of their diet. Sheep will, however, even when good pasture is provided them, vary their diet by nipping off seedling plants or the fresh growing parts, and the bloom with its contents of sweets from older plants of many of our common weeds. When their pasture is depleted, sheep feed readily on Wild Mustard, Ox-eye Daisy, Yarrow, Plantain, Perennial and Annual Sow Thistle, Wild Vetch or Tare, Docks, Sorrel, Lamb's Quarters, Milkweed, Ragwort, Burdock and Shepherd's Purse. In fact, there are few weeds that sheep will not eat, to the extent of preventing them from seeding, if there is not enough of their favourite grasses to satisfy them. It is only when the supply of food is unusually short that sheep will feed on plants having leaves and stems covered with bristly hairs or spines, or with a flavour that is obnoxious to them. When the plants are young and tender, however, sheep have been observed to eat such weeds as Ragweed, Blue-weed, Cockle, Orange Hawkweed, Hound's Tongue, Stickseed, Mullein, Canada Thistle, Stinkweed, Toadflax, and others that are bristly or have a pungent flavour. Thorough cultivation with a systematic rotation of crops, combined with the maintenance of as many sheep as can be kept to advantage, is a certain and profitable means of keeping weeds under control."

Pasturing the summer-fallow with sheep has given good satisfaction in many parts of the Province. The sheep pack the soil, thus conserving the moisture and keeping down any weeds which escape the cultivator during the summer.

* Farm Weeds of Canada.

*FARM IMPLEMENTS TO DESTROY WEEDS.

"The best time to destroy weeds is within two or three days after the first pair of leaves has formed on the seedling plant. In friable soils the 'weeder' is a useful implement for that purpose. The 'tilting' harrow is also satisfactory for comparatively loose soils and is preferred as a weed destroyer on firm or clayey land." Weeds are irregular in time of germination and consequently it may be necessary to harrow cereal grains several times before they reach a height where the harrow will damage the grain.

"For perennial weeds or seedlings that have become well rooted, a cultivator having 'diamond' shaped or other relatively broad shares is needed for hoed crops. The 'disc' is a favoured implement for destroying weeds in summer-fallow or in preparing a seed bed. When, however, it is desired to unearth and remove the root-stocks of perennial weeds such as Couch Grass, a narrow toothed cultivator, that will loosen the soil and bring the underground vegetation to the surface, is preferred to an implement that will cut the rootstocks, the small cuttings of which may be exceedingly persistent in growth."

* Farm Weeds of Canada.

MUSTARD FAMILY (Cruciferae)

TUMBLING MUSTARD (*Sisymbrium altissimum L.*).

Annual and winter annual of European origin introduced into this Province from the Western States. It appears first as a rosette of notched green leaves. The mature plant is from two to four feet in height, the upper leaves being much finer than those at the base of the plant.

Flowers are whitish yellow in colour, about one-third of an inch in diameter, and produced along the branches. The seed pods are long and slender, each containing about one hundred and twenty small seeds which are a greenish yellow colour when ripe, a large plant producing over 1,500,000 seeds. The seeds ripen the latter part of July.

The plant branches very profusely, the branches growing out from the main stem in such a manner as to form a spherical shaped head. At maturity it changes from a pale green to a golden yellow colour. The stem becomes very brittle, breaking off at the base and the plant blows over the prairie scattering its seeds.

Tumbling Mustard spreads very rapidly, due to its tumbling habit. It is a very rapid and vigourous grower and if at all plentiful will soon choke out a grain crop. It is disastrous to fall wheat as it will start in the fall forming a rosette of leaves, and remain in that stage without suffering any injury during the winter. In the spring the plants will be so deeply rooted that the harrow will have no effect on them. Fall wheat should not be grown on land infested with Tumbling Mustard.

Occurs in grain crops in the southern portion of the province.

Eradication.

Where land is only slightly infested, hand pull. Keep the fence borders of the fields clean. If any scattering plants are noticed in fall wheat, spud them out with a spud hoe early in the spring. Land that is badly infested should be thoroughly summer tilled.

Never allow the plants to get so large that the harrow will not completely destroy them. Seed the next year with a spring crop and harrow the grain after it is up a few inches, so as to destroy any young spring plants. Pasturing land badly infested with this weed with sheep has also been found to be a very effective remedy.

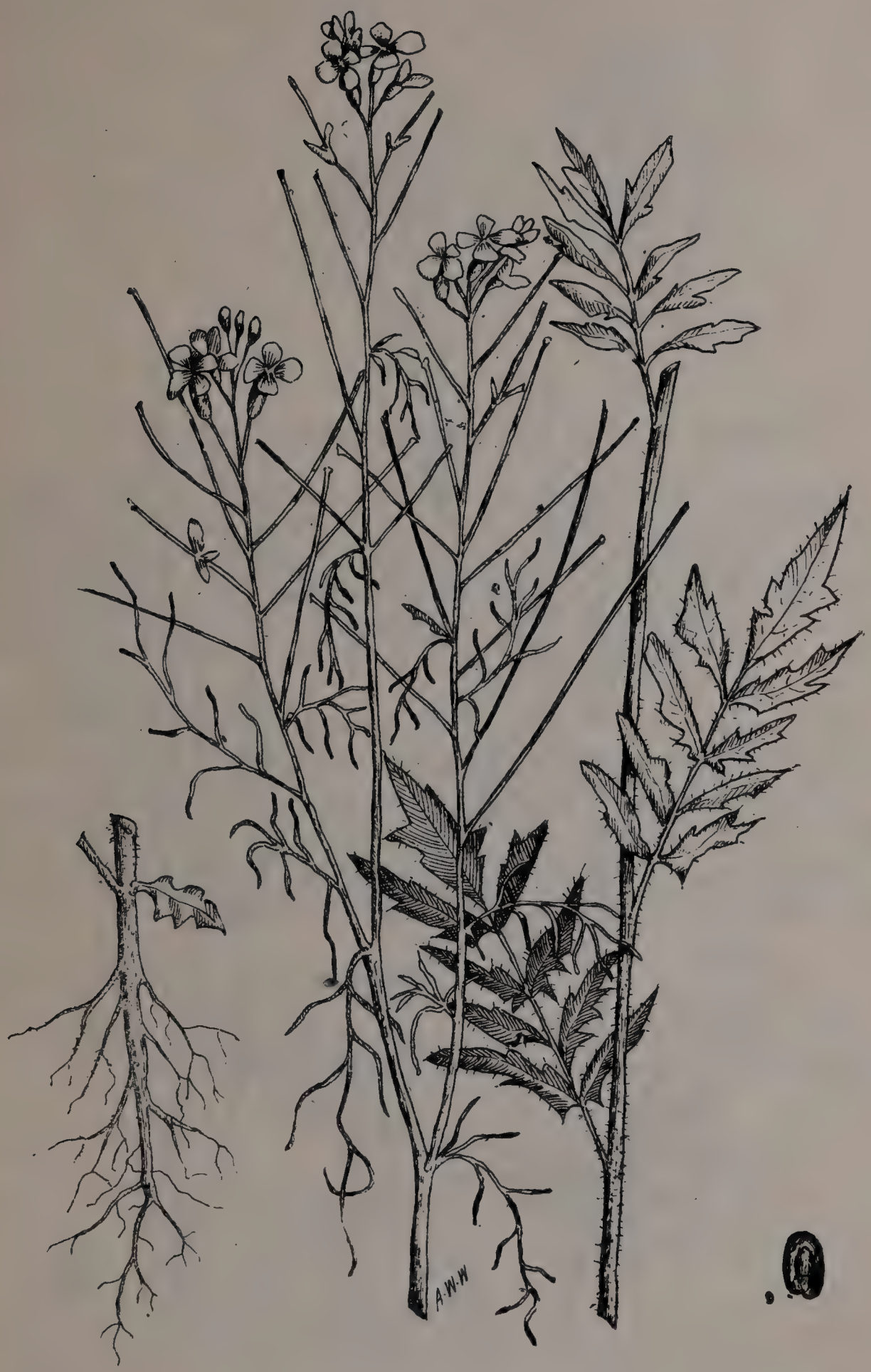

FIG. I.—TUMBLING MUSTARD.

HARE'S EAR MUSTARD (*Conringia orientalis L.*).

Annual and winter annual of European origin. An erect growing plant from one to four feet high. The young plant first appears as a rosette of thick roundish leaves lying close to the ground, but as it develops, the leaves assume the appearance of a young cabbage plant. The upper leaves which are shaped very much like a rabbit's ear are closely attached to the stiff slender stems, which become wire like when ripe.

The flowers are creamy white, about one-quarter of an inch across. Seed pods are square and from three to four inches in length.

The seeds ripen in August; are a dark brown colour, slightly roughened and are about one-twelfth of an inch in length.

Occurs quite generally in the southern part of the province, in grain fields, along roadsides and in waste places.

Eradication.

The same system as that advised for the eradication of Tumbling Mustard will successfully hold this weed in check.

FIG. II.—HARE'S EAR MUSTARD.

WILD MUSTARD (Brassica Sinapistrum Boiss. L.).

Annual of European origin. Stem grows erect, quite branching in its habit of growth, usually from one to three feet high, Lower leaves quite deeply lobed and usually with stalks; upper leaves mostly sessile.

Flowers bright yellow, two-thirds of an inch across, seed pods one and two inches long, sometimes longer, having a knotted appearance.

Seeds small, round, very dark brown, quite smooth, very similar to rape or turnip seed, ripening in August and September.

It is a very rank growing troublesome weed. The most serious feature about this weed is that it saps the moisture from the soil, which is required for the growth of the crop.

It occurs quite genera ly throughout the province.

Eradication.

On account of the great vitality of the seed, this mustard is very difficult to eradicate. Seeds which are ploughed under retain their power of germination for years and will grow immediately when brought to the su face. Care should be taken to sow seed which is free from mustard seed. When buying flax seed, especially, it should be examined closely for seeds of this weed. When the plants are scarce, hand pulling is the most effective remedy.

Where land is badly nfested, disc as soon as the crop is harvested. Disc again in the spring. Plow in June and follow with a thorough cultivation throughout the summer each time the weeds appear. Harrow the succeeding crop as soon as it appears above the ground to kill the seedling plants. When it is not practicable to summer-fal'ow, follow the above method, but after plowing in June seed heavily to barley and cut for green feed before the mustard is ripe.

Spraying with Chemicals.

It has been successfuly proven that solutions of blue vitriol (copper sulphate) or copperas (iron sulphate) will destroy mustard without injury to the standing grain. From experiments conducted by this Department and by various experiment stations, the indications are that iron sulphate is rather more satisfactory than copper sulphate.

A twenty per cent. solution of iron sulphate is made by adding 80 pounds of iron sulphate to 40 gallons of water. The spraying should be done on a bright, sunny day when the young mustard plants are about to bloom. If it is done at this time, practically every plant touched by the solution will be destroyed. If the work is delayed until some of the older plants have formed pods, it will not be nearly as effective, as the tissues of the plants have become so hardened that the solution will not affect them.

In using copper sulphate a two per cent. solution is the proper strength, and is made by adding one pound of copper sulphate to five gallons of water. A potato sprayer with a wide extension rod to which several nozzles may be attached, has been found to be a most effective machine for applying the solution.

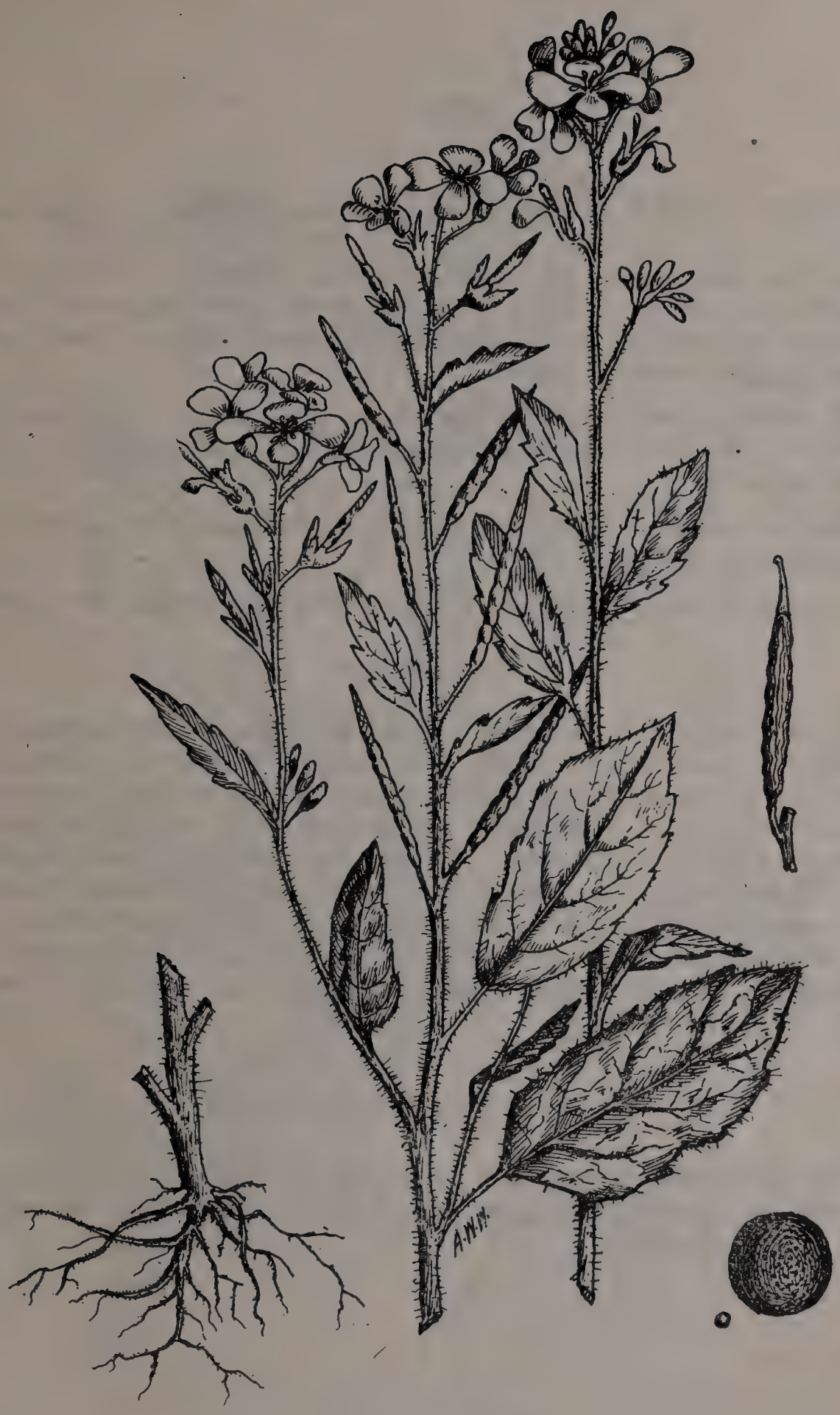

FIG. III.—WILD MUSTARD.

GREEN TANSY MUSTARD (Sisymbrium incisum Engelm).

A tall, rank growing native biennial. During the first season it grows as a rosette of finely notched leaves, growing erect from one to three feet high, considerably branched. Leaves very much divided, bright green in colour.

Flowers yellow, small, borne on long racemes. Seed contained in short pods about one-half inch long, each pod being borne on a slender stalk.

Seed is reddish brown and about one-sixteenth of an inch long. Seeds ripen in August.

Occurs in many places in the southern portion of the province.

Eradication.

A serious pest in fall wheat districts owing to its biennial habit of growth. In districts where this weed is prevalent, spring grain should never be sown on stubble land unless it first be ploughed carefully and then thoroughly cultivated. In bad cases summer-fallowing may be necessary. In summer-fallowing care should be taken to destroy all the plants that start, and cultivation should be continued until late in the fall so as to destroy any rosettes which have started and would otherwise live through the winter. All plants found in waste places should be pulled or cut, and thus prevented from spreading.

GRAY TANSY MUSTARD.

The Gray Tansy Mustard resembles the Green Tansy Mustard quite closely, except in colour. Methods of eradication same as for Green Tansy Mustard.

FIG. IV.—TANSY MUSTARD.

BALL MUSTARD (*Neslia paniculata L.*).

Annual and winter annual of European origin. Grows from two to four feet high with slender, erect stems. The lower leaves are lance shaped and pointed at the base, while the upper leaves are arrow shaped clasping the stem with two sharp, projecting points. The whole plant is a light green colour and is covered with fine hairs.

Flowers are small and bright yellow, borne on long racemes.

The seed is borne in small, round seed pods on the end of short slender stems, one seed in each pod. When mature, the pod contracts about the seed and is a greenish brown in colour. The seed inside this coating is yellow, ripening the latter part of July.

This weed is very prevalent in the central portion of the province. It is very difficult to screen from the grain in threshing, thus it often occasions a very serious loss to the grain grower.

Eradication.

This is rather a difficult weed to hold in check where grain crops are grown continuously on the same land. Where this is practised, the land should be ploughed or disced in the fall and followed by thorough cultivation in the spring. Harrow the crop as soon as the plants appear above the ground, thus destroying any young weeds that may have started. This should be followed with a second harrowing and a third if necessary.

In very bad cases it may be necessary to summer-fallow in districts where summer-fallowing is practicable.

Cut the weeds around the edges of the field before the seeds are formed.

Sow clean seed.

FIG. V.—BALL MUSTARD.

WORMSEED MUSTARD (Erysimum cheiranthoides L.).

Wormseed or Treacle Mustard is a native annual and winter annual. It grows erect from six inches to two feet high. The whole plant is covered with short hairs. Leaves, bright green, abundant, lance shaped and slightly toothed.

Flowers, bright yellow, one-quarter inch across, usually borne in terminal clusters about one inch across. The seed pods are erect and parallel to the stem. The stalks or pedicels upon which they are borne are oblique to the main stem.

The seeds ripen in July and are very small, about one-sixteenth of an inch in diameter, but uneven in size, reddish yellow in colour, and very bitter.

Occurs in small quantities in various parts of the province, usually in waste places but sometimes in cereal crops.

Eradication.

The seeds of this plant are very short lived. It is therefore not as difficult to get rid of as some of the other members of the mustard family. Cultivating stubble land in the fall after the crop is removed and thoroughly preparing the land in the spring before seeding will hold this weed in check.

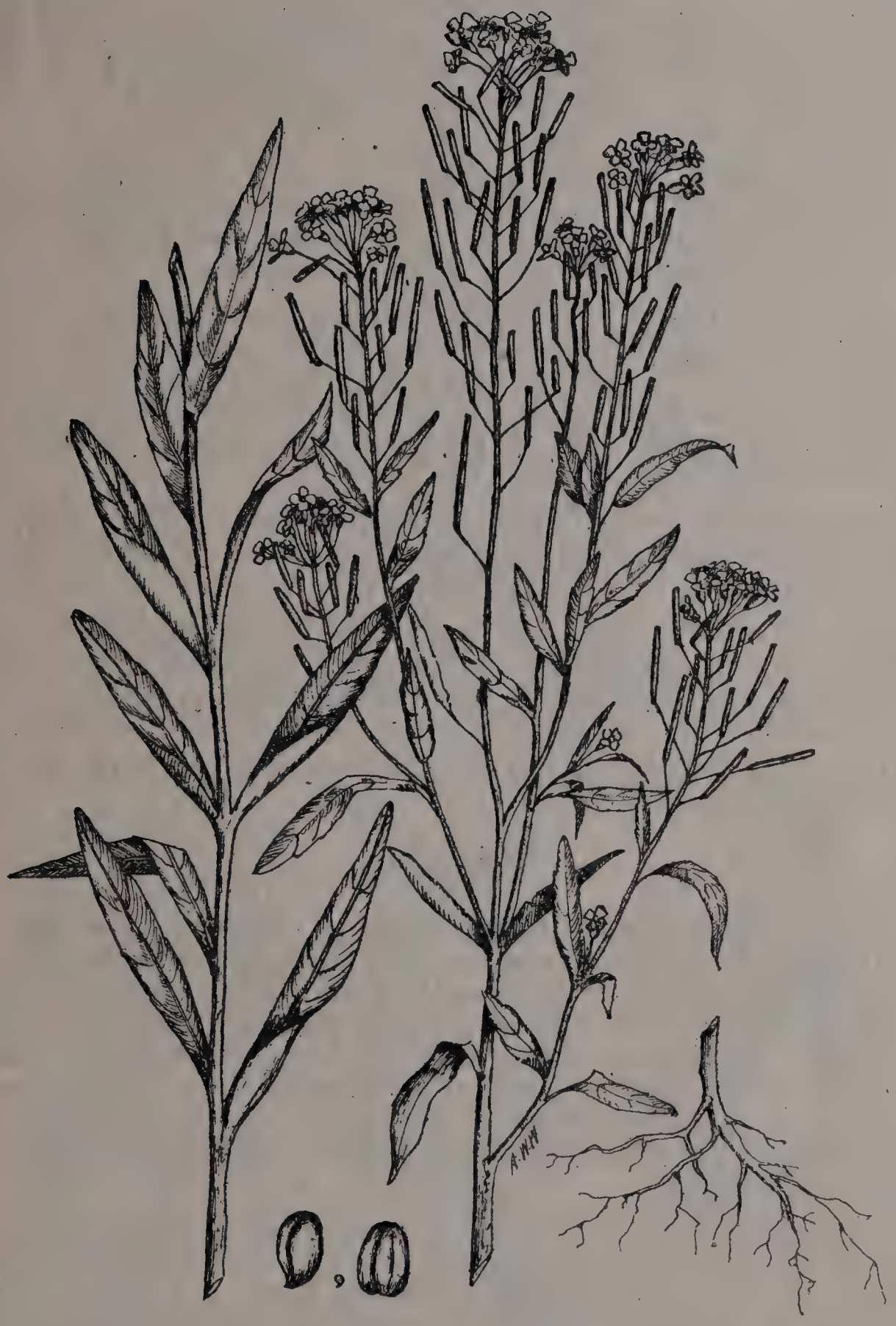

FIG. VI.—WORMSEED MUSTARD.

STINKWEED (Thlaspi arvense L.).

Other English names, Penny Cress or Frenchweed.

Annual and winter annual of European origin introduced from Manitoba.

The plant varies in height from three inches to two feet. Colour a dark green when young, changing to a golden yellow when mature. Lower leaves borne on footstalks; stem leaves spear shaped clasping the stem at the base. The plant when bruised gives off a very offensive, garlic-like odour.

Flowers white, about a quarter of an inch across, situated at the top of the leafy stems. Pods one-half to three-quarters of an inch across, and borne on slender stalks, winged and notched at the top, each containing from eight to sixteen seeds.

The seeds are flat and unsymmetrically oval. The flat surface has five or six loop-like lines running around the seed terminating at the basal notch. They contain a large percentage of oil and if covered over two inches in depth will remain in the soil for years, retaining their vitality ready to start growth as soon as they are brought to the surface.

Stinkweed is a very persistent and vigourous grower. Once it obtains a foothold it multiplies rapidly and will soon completely cover the ground.

Plants that start late in the fall will live through the winter without suffering any injury. They begin a vigourous growth in the early spring and they are therefore particularly injurious to fall wheat. These winter plants will mature quite early in the season.

Occurs in various parts of the province in grain crops, gardens and waste places.

Eradication.

If the area infested with stinkweed is very large it is wise to seed the greater portion to grass and fight the weeds on a small portion at a time. Be sure to mow down the grass on the portion seeded a number of times the first year so as not to allow any of the stinkweed to mature. *If the plant is allowed to reach the pod stage before it is cut, there will be enough substance in the plant to ripen seeds.* During the first year most of the seeds within two inches of the surface will germinate and the plant will be held in check while the land is left seeded to grass.

Thoroughly summer-fallow the remaining or smaller portion of the infested land never allowing the plants to get beyond the point where the harrow will completely destroy them. Cultivate as late in the fall as possible. Harrow the land well the following spring and sow with spring grain. Harrow the crop after it is up at least twice, in order to kill any young weeds. Hand pull any scattering plants. Keep the fence borders of the field clean. Never plough under stinkweed after it has reached the pod stage, as the seed will ripen sufficiently to germinate when brought to the surface.

Be sure not to sow seed grain containing stinkweed seed.

FIG. VII.—STINKWEED.

SHEPHERD'S PURSE (Capsella Bursa-pastoris L.).

Annual and winter annual of European origin, of an erect habit of growth; varies from a few inches to two feet in height, also varies in colour from green to gray. Root leaves are lobed and usually form a rosette which lies close to the ground, though in some plants this is absent. The stem leaves are arrow shaped, clasping the stem.

Flowers small and white. The seed pod is quite conspicuous and is invariably uniform in shape which is flat triangular, with a fairly deep notch in the top.

Seeds ripen during the entire season. This weed occurs throughout the province. Owing to the fact that the plants which start late in the fall will live through the winter it is often troublesome in fall wheat and has been known to crowd out poorly seeded meadows.

Eradication.

Clean up waste places and prevent plants from seeding. Summerfallowing in bad cases will hold it in check.

Follow method as outlined for Tumbling Mustard.

FIG. VIII.—SHEPHERD'S PURSE.

YELLOW WHITLOW GRASS (*Draba nemorosa L.*).

Native annual and winter annual, growing from six to eight inches high. The whole plant is slightly downy, branching below and bearing leaves to the elongated raceme. Leaves stalkless, lance shaped, slightly toothed.

Flowers yellow, bearing flat seed pods, about three-eighths of an inch in length.

The seed is egg shaped, flattened, reddish brown in colour; usually ripens in June, often before ploughing is done.

It occurs frequently in stubble throughout the province.

Eradication.

Cultivate both in the fall and in the spring. Plough early for summer-fallow before the seed is formed.

FIG. IX.—YELLOW WHITLOW GRASS.

WILD RADISH (Raphanus Raphanistrum L.).

Annual and winter annual of European origin growing from one to two feet high. The branches are few, starting near the base of the plant. Leaves large, pale green, deeply lobed and hairy.

In general appearance it resembles wild mustard, but its yellow flowers are fewer in number, larger, have purplish veins on the petals and the pods are more jointed in appearance. The seed pods of wild radish have no valves but are composed of two joints. The lower is small, seedless and remains attached to the footstalk. The upper one contains several one-seed cells.

The seed varies in size and shape being usually oval, slightly flattened, light reddish brown, with a finely roughened surface.

Eradication.

It is as serious a pest in every way as Wild Mustard when once established. Sow clean seed. Hand pull. Seed to barley, seeding to timothy at the same time. Harrow growing barley to kill any seedling plants. Thorough summer-fallowing is also an effective remedy.

FIG. X.—WILD RADISH.

WILD PEPPER GRASS (Lepidium apetalum Willd.).

A native annual and winter annual of an erect habit of growth, varying in height from six inches to two feet. The whole plant is grayish in colour and is covered with short hairs. Plants which start in the fall first appear as a rosette of dark green, deeply notched leaves. The stem leaves are closely attached, coarsely toothed and narrowed at the base. As the plant matures, these leaves drop off.

Flowers are inconspicuous, borne on racemes.

Seed pods small, heart shaped, each containing two reddish yellow oval seeds. Individual plants have been known to produce as many as 18,000 seeds.

Seeds ripen from June to July.

Occurs generally throughout the province, in waste places, gardens and cultivated fields.

Eradication.

Owing to the fact that some of the plants start in the fall and live through the winter it is especially troublesome in fall wheat or in crops which are sown on stubble land in the spring. Ploughing stubble land before seeding, with a thorough spring cultivation, will keep it in check. Summer-fallow in very bad cases.

FIG XI.—WILD PEPPER GRASS.

FALSE FLAX (Camelina sativa L.).

False Flax, sometimes called Balloon Mustard; it is an annual and sometimes a winter annual of European origin. It grows erect from two to three feet high, branching almost entirely from the upper portion of the stem. The lower leaves are lance shaped and the upper ones quite sharply arrow shaped, both upper and lower leaves clasp the stem. Leaves and lower portions of the stem, downy. The upper portion of the stem is quite smooth.

Flowers yellow, rather inconspicuous, borne in loose clusters.

Seeds are enclosed in pear-shaped pods situated at the end of slender stems. Each pod is terminated with a slight projection at the upper end, and contains about ten seeds, of a reddish yellow colour.

Seed ripens the latter part of July. Occurs generally in small quantities throughout the province. Is an impurity often found in flax seed.

Eradication.

Owing to the fact that some of the plants are winter annuals it is not advisable to grow fall wheat on land badly infested with this weed. Avoid sowing spring grain on land which has not been ploughed. Harrow immediately after the grain appears above the ground. Summer-fallow in very bad cases.

FIG. XII.—FALSE FLAX.

SMALL WALLFLOWER (Erysimum parviflorum Nutt.)

A native biennial of the mustard family, sometimes mistaken for Wormseed Mustard which it somewhat resembles. It is, however, coarser throughout, and the whole plant is of a sage-like colour.

The flowers are yellow, and slightly larger than those of the Wormseed Mustard. The seed pods are borne on shorter stems and are considerably larger and coarser than those of the Wormseed Mustard. They are also borne at a different angle on the stem. Seeds, small, irregular in shape and brownish in colour.

Occurs mostly in the southern part of the province and is sometimes troublesome in crops sown on stubble land.

Eradication.

If the land is quite badly infested, plough and thoroughly cultivate before seeding.

Hand pull any scattering plants found in the crop.

FIG. XIII.—SMALL WALLFLOWER.

SUNFLOWER FAMILY (Compositae)

CANADA THISTLE (Cirsium arvense L.).

A deep-rooted perennial of European origin with creeping root-stocks, which send up shoots at intervals from two to four feet high. Leaves deeply notched and very prickly, with a somewhat crimped appearance. The under surface of the leaves is woolley and grayish in colour; the upper surface is smooth and dark.

It produces a large number of flower heads, containing flowers which are from three-quarters to one inch across, light purple in colour.

The seed is about one-eighth of an inch long and of a golden colour with a tuft of fine down at the top, by means of which it is distributed by the wind. Seeds ripen about July or the first of August. It is propagated both by its seeds and extensive root-stocks, the latter penetrating the soil f om ten to fifteen inches.

This weed is abundant in the south-western part of the province and is rapidly spreading north and east. It crowds out grain crops on account of its rank growth.

Canada Thistle is quite commonly mistaken for Prairie Bull Thistle by those unfamiliar with the two weeds. The Prairie Bull Thistle has white woolley leaves and stems and much larger flower heads than the Canada Thistle.

Eradication.

If Canada Thistles occur in small patches only, keep them in check by cutting with a spud hoe every time they appear above the ground. When the infested area is large, allow the plants to grow until the flower bud has formed, then cut with a mower as close to the ground as possible. By allowing the plants to reach the flower bud stage, the roots will be somewhat exhausted of food material and will be in a weakened condition. Plough deeply, following with a thorough cultivation with a spring tooth cultivator bringing as many of the roots as possible to the surface. Give the ground a thorough surface cultivation until quite late the following spring. Seed heavily with barley and cut for green feed. Cultivate with a sharp-shared cultivator at intervals each time new stems are thrown up.

FIG. XIV.—CANADA THISTLE.

PERENNIAL SOW THISTLE (Sonchus arvensis L.).

Perennial Sow Thistle, Field Sow Thistle or Creeping Sow Thistle. A deep rooted perennial of European origin with creeping root-stocks. Upon these root-stocks at short intervals are buds which send up new plants. The plant grows fairly erect from one to four feet high. Stem hollow, simple and branching at the top. When broken it exudes a bitter, milky juice. The leaves are from six to ten inches long, deeply notched and covered with soft spines.

Flowers bright yellow, one and one-half inches across, resembling somewhat the ordinary lawn dandelion.

The seed is about one-eighth of an inch long and a dark reddish brown. Each seed bears at the top a tuft of soft, silky hairs which spread when dry and enable the seeds to be carried long distances by the wind. The seed ripens in July. This plant is propagated very rapidly by means of its seeds and extensive root-stocks.

At present it occurs to a very limited extent in the province. So far, it has been found in cities and towns only, not yet having spread to the country. It increases rapidly entirely choking out crops and greatly reducing the yield.

Eradication.

When it occurs in small patches, it should be dug out, taking care to get all the roots possible. These should be burned. If it should spread over a large area, some system must be undertaken which will prevent the development of the plants. A proper method of summer-fallowing is the best way. Plough shallow early in the season and follow this with a thorough cultivation throughout the summer with a broad-shared cultivator. Do not use a disc harrow as the roots will merely be chopped up and will start to grow again. Plough again in the fall and cultivate until quite late the following spring.

Gather any roots that are collected by the harrow and burn them. If possible, plant potatoes on the infested area and cultivate thoroughly. Hand pull any plants which may escape the cultivator. If it is not practicable to grow potatoes, seed heavily with barley and cut for green feed.

ANNUAL SOW THISTLE (Sonchus oleraceus L.).

Common Sow Thistle, or Milk Thistle, is a rank growing annual of European origin with fibrous roots. It differs in this respect from Perennial Sow Thistle, which has extensive creeping root-stocks. The stems are very slightly branching, growing from one to four feet high, covered with coarse hairs, leaves deeply notched, each leaf being terminated by a large lobe; base of leaves clasp the stem with two sharp points.

Flowers pale yellow in colour, about one-half inch or one inch across, resembling very much the common lawn dandelion.

Seed is about one-eighth inch long, dark reddish brown, is a little shorter than that of the Perennial Sow Thistle, and the ridges are farther apart. The whole seed is crossed with wrinkles. Seed ripens in July.

Found in portions of the province in waste places and gardens.

Eradication.

Prevent from seeding by destroying the weeds wherever found by hand pulling or hoeing when found in gardens.

FIG. XV.—PERENNIAL SOW THISTLE.

BLUE LETTUCE (*Lactuca pulchella D.C.*).

A deep-rooted native perennial growing from two to three feet high with spreading underground roots. Stem and leaves quite smooth. When broken, the stems exude a thin milky juice. The lower leaves are deeply notched at the base, lance shaped, terminating in a large oval pointed tooth. The upper leaves are long, lance shaped and very slightly notched. The whole plant is covered with a whitish bloom.

The flowers are borne in panicles at the top of the plant; pale blue in colour and about one inch in diameter.

Seed about three-sixteenths of an inch across terminating in a short, thick beak at the end of which is borne a tuft of pure white down. Seeds ripen about end of July.

Occurs in waste places and along roadsides, but is rapidly spreading into cultivated fields.

Eradication.

This weed is difficult to destroy on account of its deep root. Prevent from seeding by cutting before seeds are formed. To hold in check when established in grain fields a thorough summer fallowing is the most effective means.

Follow the same method as advised for the eradication of Canada Thistle.

FIG. XVI.—BLUE LETTUCE.

GREAT RAGWEED (Ambrosia trifida L.).

Bitterweed, Tall Ragweed, Kingweed or Crownweed. A tall, coarse branching native annual with rough, hairy leaves and stems. Grows from four to six feet high. Leaves pale green in colour, opposite, mostly three lobed.

Individual flowers inconspicuous. Sterile and seed producing flowers being borne on different parts of the same plant. The sterile flowers are borne on long spikes and the seed-bearing flowers are borne in clusters in the axils of the leaves at the base of the spikes

The seed is about one-quarter of an inch long. The similarity in shape of this seed to a crown has suggested the name of Crownweed, sometimes used in reference to the plant. Seeds ripen about the beginning of August.

Does not occur to any great extent in the province. Found principally along roadsides, railways and in waste places. Is serious when occurring in grain fields.

It is a gross feeder and the seeds are very difficult to separate from the grain, owing to the long spines which form the crown, catching in the meshes of the screen.

Eradication.

Hand pull when found in grain fields, if the plants are not too plentiful. Cut weeds found in waste places and along roadsides before seeds are formed. Summer-fallow in bad cases, cultivating thoroughly throughout the summer.

FIG. XVII.—GREAT RAGWEED.

POVERTY WEED (Iva axillaris Pursh.)

Native perennial from six to twelve inches high; stems herbaceous, branching, growing from creeping root-stocks. The whole plant has a very rank odour. The leaves are rough, hairy and obovate in shape. The lower leaves are opposite, the upper ones alternate.

The flowers are inconspicuous, hanging on short pedicels in the axils of the upper leaves.

Seed about one-eighth of an inch long, variable in colour from yellowish brown to black with a mealy surface.

This weed is usually found in waste places and on alkali soil. It seldom occurs in grain fields. It forms a matted growth exhausting the soil of moisture and rendering the land hard to work.

Eradication.

Summer-fallowing is the most effective remedy. Plough deeply, using a sharp share so as to cut off the roots, followed by frequent cultivation with a sharp-shared cultivator.

FALSE TANSY (Artemisia biennis Willd).

A native biennial of a coarse rank habit of growth. Leaves are dark green in colour and finely divided.

Flowers inconspicuous. Not serious as yet in the province. Sometimes occurs in crops sown on stubble to such an extent as to interfere with binding the grain.

Eradication.

Plough in fall or spring, or summer-fallow in bad cases.

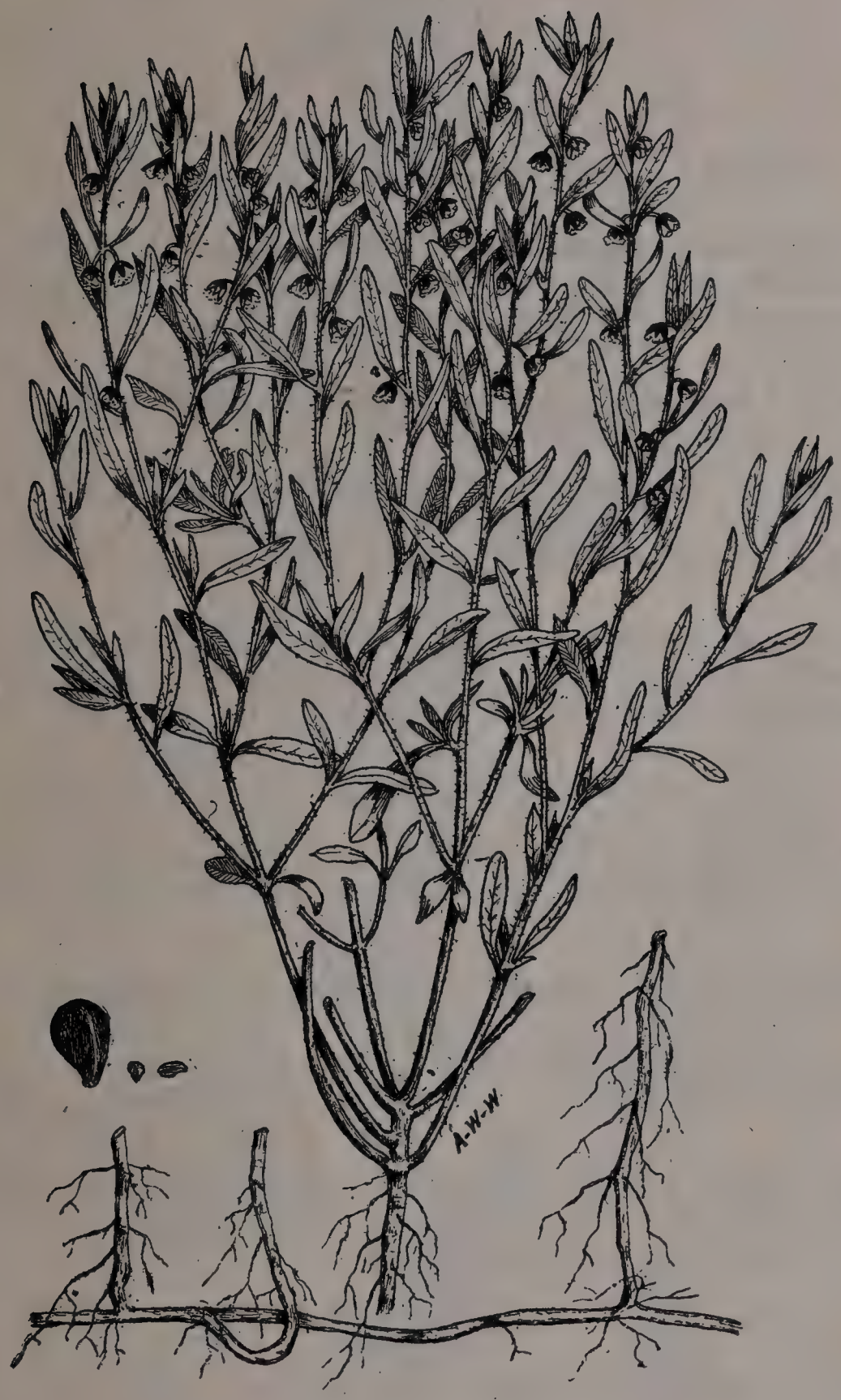

FIG. XVIII.—POVERTY WEED.

COCKLE BUR (Xanthium strumarium L.).

A coarse-growing native annual, considerably branched, which varies in height; under favourable conditions it will sometimes grow as high as three feet, though usually much smaller. Leaves large, heart shaped.

Male and female flowers are borne on different parts of the plant and along branches.

The burs are about one inch in length and are thickly covered with strong spines which are curved at the ends. These burs stick to the hair of animals and are especially troublesome where sheep are pastured.

This weed occurs in the southern portions of the province but up to the present is found mostly along roadsides and in waste places. Sometimes troublesome in grain crops in Eastern Canada.

Eradication.

Prevent seeding by hand pulling and mowing wherever found. In cultivated fields, harrow the land soon after the grain starts.

FLEABANE OR HORSEWEED (Erigeron canadensis L.).

Tall-growing branched annual plant, stems covered with fine hairs or bristles; leaves rather long and narrow, the lower ones being dentate.

Flowers small, white, produced on pedicels springing from axils of leaves, forming a panicle. Found in most meadows and pastures. Not a very serious pest in this province.

Eradication.

Prevent from going to seed by cutting. In bad cases, summer-fallow.

FIG. XIX.—COCKLE BUR.

GRASS FAMILY (Gramineae)

WILD OATS (Avena fatua L.).

Annual of European origin introduced into Alberta from Eastern Canada. The plant resembles cultivated oats.

The panicle is quite compact when it first appears but soon forms a spreading head.

The seeds vary in colour, being dark brown, gray and yellowish white. They are quite similar to the cultivated oats, but are slimmer and have a right angled twisted awn and stiff bristles around the base. These are often removed by threshing. The base of the seed has a horse-shoe shaped scar which is one of the best means of identification.

Wild oats are more hardy than the cultivated variety. They will retain their vitality in the soil for a number of years and will germinate whenever conditions are favourable. The seeds ripen unevenly, those at the top of the head ripening first, and falling off long before the grain is ready to harvest, thus keeping the soil polluted.

Occurs throughout the entire province.

Eradication.

Land that is infested with wild oats should be disced after harvest to germinate the seeds that have fallen during harvesting. It may be necessary to disc a second time to prevent plants from reaching maturity. Disc again early in the spring. Plough in June, following with a packer, as it is necessary to make the soil firm in order to get all the wild oats to germinate. Harrow at intervals during the summer to destroy the young plants. Another method that has given satisfaction is to seed with green feed and harvest the crop before the wild oats have had a chance to ripen. It may be necessary to cut the green feed a second time later in the season, as wild oats which are cut when the plant is in flower will throw up flowering stems and produce seeds very quickly.

Hand pull any scattering plants you may find in your crop next season.

If the infested area is fenced, one of the best methods of eradicating wild oats is to seed lightly with oats and pasture the land severely. The stock tramping over the soil will pack it, causing the wild oats to germinate.

FIG. XX.—WILD OATS.

WILD BARLEY OR SQUIRREL TAIL GRASS (Hordeum jubatum L.).

A native perennial grass growing usually about one foot high. The heads are heavily awned with fine silky awns giving the head a slight resemblance to barley.

Before the heads are ripe the awns are tender but when they become ripe they are very stiff and cause considerable inconvenience to cattle, sheep and horses that eat them. The awns pierce the lips and also work down around the teeth causing inflammation. Reports have also been received stating that they have been known to work into the wool around the eyes of sheep, in some cases even penetrating the eye-ball, causing blindness. It is also very troublesome in hay.

This weed occurs practically all over the province, growing only in low, wet places which are more or less alkaline.

Eradication.

It is easily controlled on land which can be ploughed as this destroys it at once. The most effective remedy in cases where it is not advisable to plough is to cut with a mower before the seed is formed. It may be necessary to do this twice during the season, but if done at the proper time there will be no difficulty in eradicating the weed.

FIG. XXI.—WILD BARLEY.

COUCH GRASS OR QUACK (Agropyron repens L.).

A perennial of European origin with spreading fleshy root-stocks. Leaves a dark green, quite distinctly ribbed.

The spike or head is quite narrow, flowers borne in three to seven flowered spikelets lying flat against the rakis or stock.

Eradication.

Thorough summer-fallowing has been found to be the most effective remedy. Plough shallow using a sharp share and cultivate thoroughly with an ordinary spring tooth cultivator. Clean off teeth of the harrow at each end of the field and throw the accumulated roots in a pile. Follow the spring tooth harrow with a diamond harrow. This will collect the roots into piles, when they should be burned as soon as dry, before they have an opportunity to take root again.

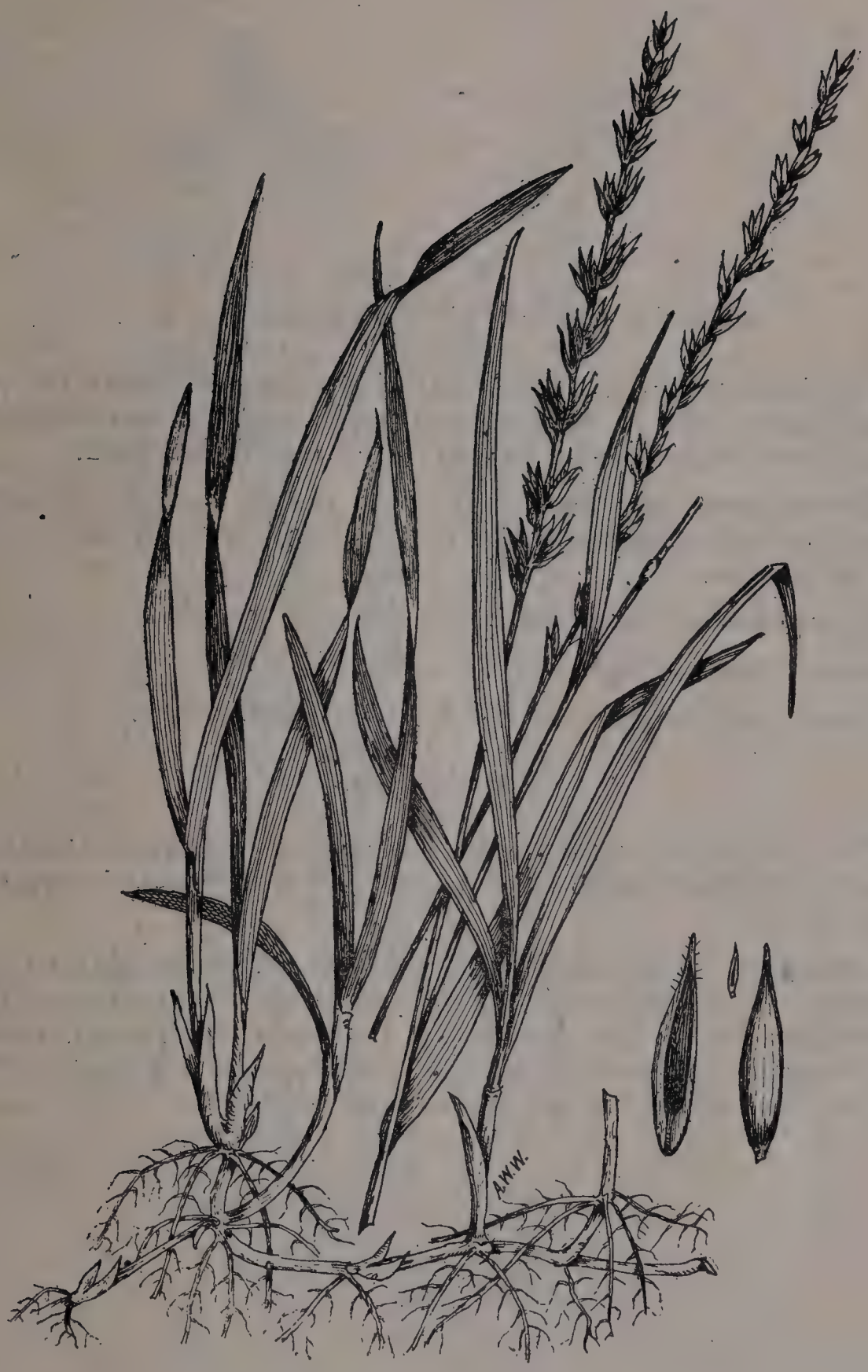

FIG. XXII.—COUCH GRASS.

SWEET GRASS (Hierochloe odorata L.).

A native perennial. As its name implies, this plant has a very pleasant odour. It is deep rooted with creeping root-stocks, and sends up stems usually from twelve to eighteen inches high.

Flower stems are thrown up early in the spring. The flowers are borne in loose panicles which contract and are of a dark brownish colour when ripe.

The seeds very much resemble timothy seed.

Seeds ripen in June.

Occurs quite commonly throughout the province.

Eradication.

The creeping root-stocks in this case as in that of Couch Grass makes it a difficult weed to combat. "Farm Weeds" recommends as follows:

"Mow and burn while the grass is in bloom in May to destroy the seeds. Then plough deeply to get below the root-stocks which may be brought to the surface by thorough cultivation. continued throughout the summer. This will be made more effective by deep ploughing as late in the fall as the frost will allow."

FIG. XXIII.—SWEET GRASS.

GOOSEFOOT FAMILY (Chenopodiaceae)

RUSSIAN THISTLE (*Salsola kali L.*).

Other names, Russian Tumbleweed, Russian Cactus.

An annual of Asiatic origin. The leaves and branches of the young plant when quite young are very dark green in colour and thread-like in form, somewhat resembling a pine tree seedling. As the plant grows, it gradually assumes a spherical form, and the branches are covered with lines and splashes of red. Each branch is covered with small pine-like leaves arranged in threes.

When young, the plants are succulent and are eaten readily by stock. As it becomes older the leaves become stiff and prickly and the whole plant gradually assumes a bleached appearance. When mature it breaks off at the root and blows over the country scattering seeds as it goes.

The flowers are quite inconspicuous and are borne in the axils of the leaves.

The seed is about one-sixteenth of an inch in diameter, conical in shape, and the outer coat is grayish and ragged in appearance. When this is removed, the coiled germ is exposed. Seed ripens in August.

It occurs in the southern portion of the province in grain fields, along road-sides and in waste places.

Eradication.

On account of its rank growth and the fact that it grows best in dry places it does serious injury by using up moisture required for the development of the grain. When the land is only slightly infested, hand pulling is an effective remedy. Where the infestation with this weed is bad, harrowing just after the grain shows above the ground will destroy most of the young plants. In very bad cases, summer-fallowing is the best method. The land should be worked thoroughly throughout the summer with a duck-foot cultivator. This weed is not usually troublesome on land sown to winter wheat as it is very susceptible to frost and any young plants starting about the same time as the wheat will be destroyed.

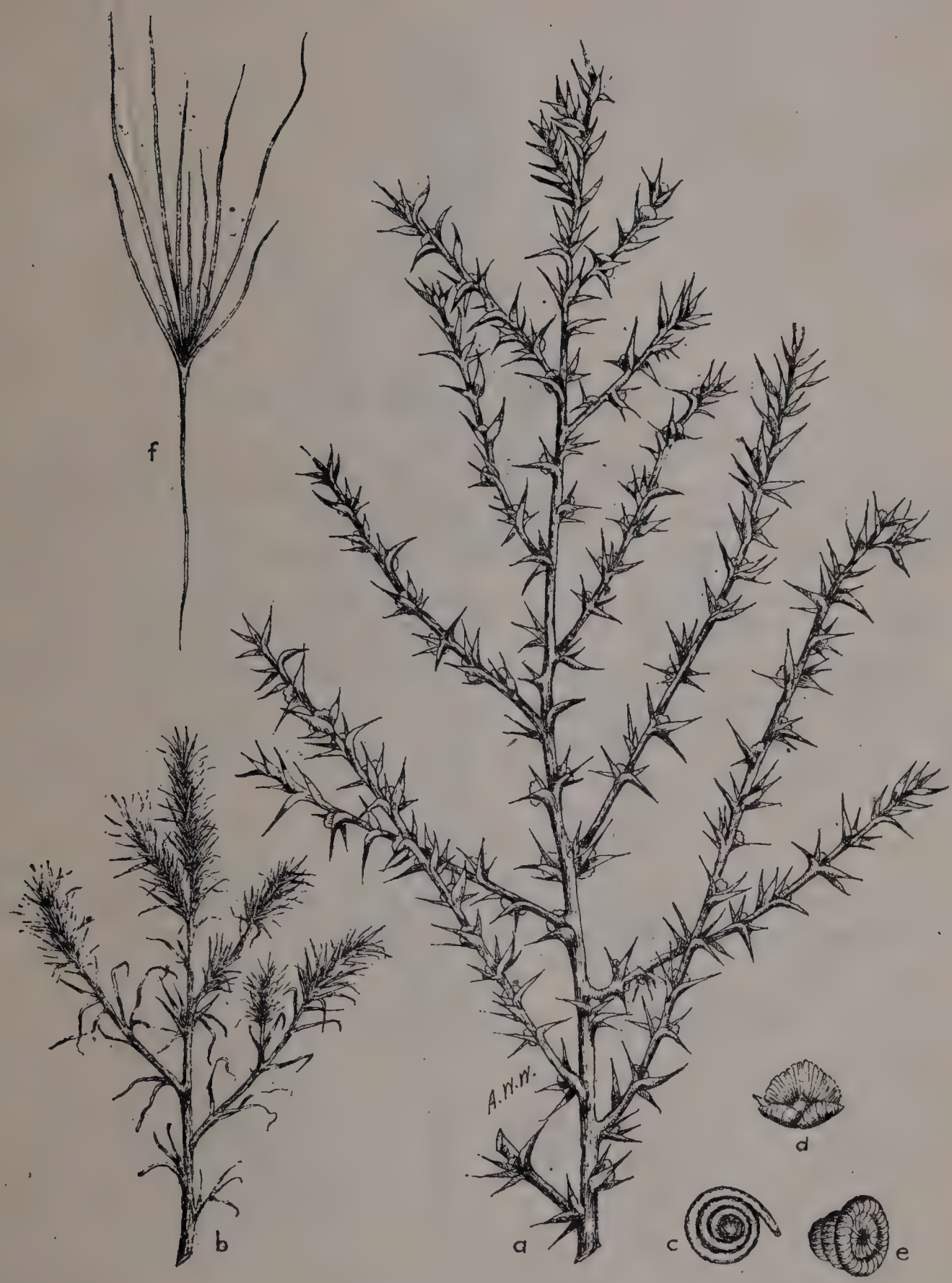

FIG. XXIV.—RUSSIAN THISTLE.

LAMB'S QUARTERS (*Chenopodium album L.*).

A native and European annual varying great y in its general characteristics. It varies in height from one to six eet, stems erect, slender and grooved, usually much branched. Leaves pale green in colour, much notched and borne on long, s'ender stocks.

Flowers are greenish in colour and arranged in compound spikes, borne in the axils of the leaves. Individual flowers inconsp'cuous.

Seed small, round and flattened on one side, shiny black in colour, ripening from August to November.

Occurs generally throughout the province in gardens, grain fields and in waste places.

Eradication.

The system advised for the control of Pigweed or Red Root will success ully hold this weed in check.

FIG. XXV.—LAMB'S QUARTERS.

SPEARLEAF GOOSEFOOT (*Monolepsis chenopodiodes Moq.*).

A native annual with low spreading habits of growth. The whole plant is dark green in colour, resembling lamb's quarters to some extent. The leaves are spear shaped and fleshy.

The flowers are borne in the axils of the leaves and are quite inconspicuous.

It occurs quite generally throughout the province, along road-sides, in waste places, and in gardens.

Eradication.

When it is found growing in gardens, and along road-sides, cut with a hoe before the plants go to seed. When found in grain fields, the usual methods advised for the destruction of annuals will hold it in check.

MAPLE-LEAVED GOOSEFOOT (*Chenopodium hybridum L.*).

Annual with large, bright green coarsely toothed leaves. Resembles lamb's quarters very much in general habits of growth. Occurs in waste places and sometimes in grain fields in various parts of the province.

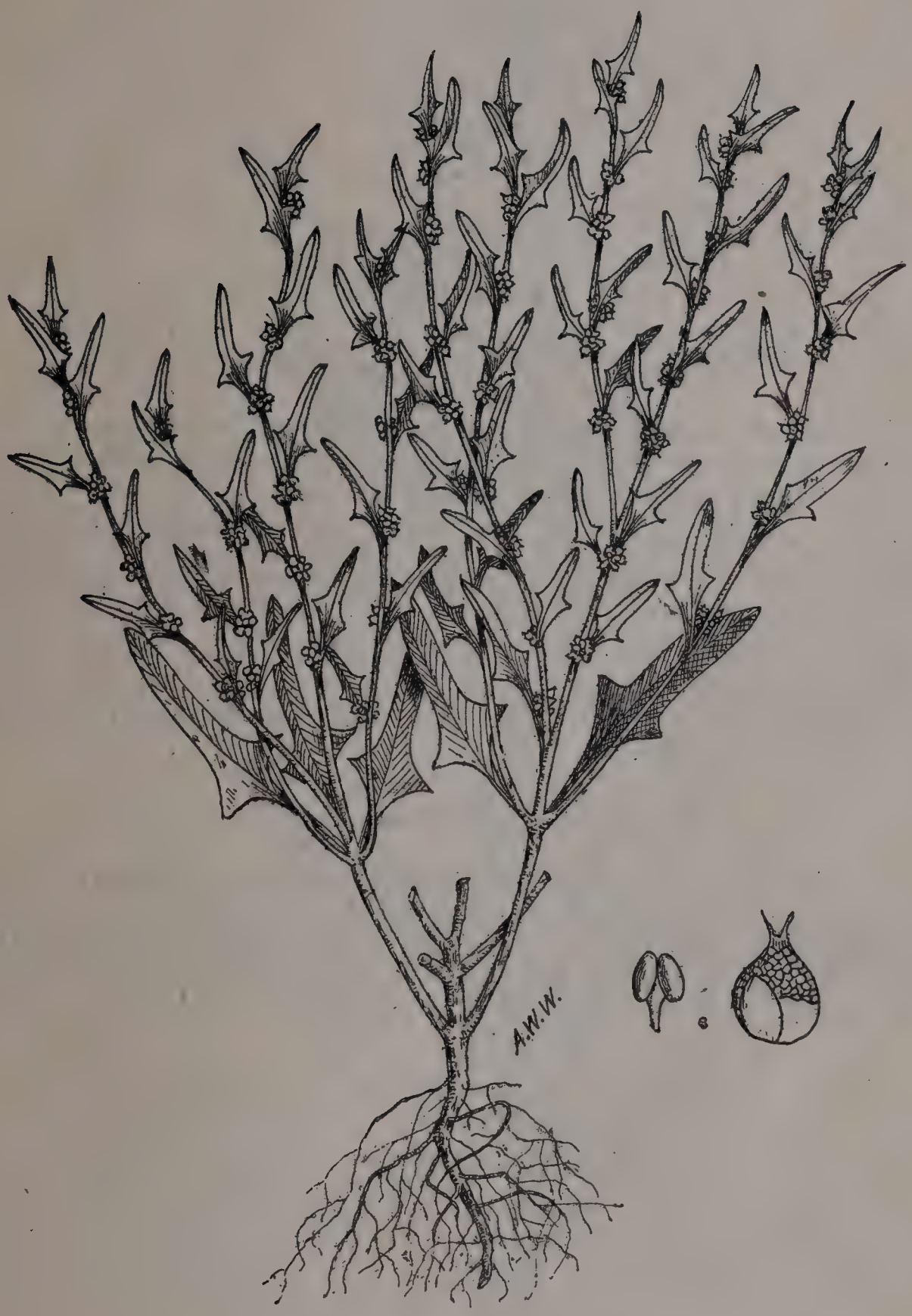

FIG. XXVI.—SPEARLEAF GOOSEFOOT.

RUSSIAN PIGWEED (Axyris amarantoides L.).

A tall, coarse-growing annual of European origin, grows erect from two to four feet high, is much branched and very leafy. Leaves and entire plant are rather pale green in colour.

Flowers inconspicuous. When full grown it is pyramidal in shape and a light golden colour. Individual plants have been known to produce as many as 25,000 seeds. Ripens about July or August.

It is a rank growing weed, usually found along railways, roadsides and in waste places. When it occurs in grain crops it crowds out the grain and gives trouble at harvest time, interfering with the working of the binder.

Eradication.

Cut all weeds found in waste places before they form seed. Hand pull when plants are scarce, summer-fallow in bad cases and harrow the succeeding crop shortly after the grain is up. Where timothy can be grown it is usually advisable to seed down with this crop for a few years.

FIG. XXVII.—RUSS AN PIGWEED.

PIGWEED FAMILY (Amaranthaceae)

REDROOT OR PIGWEED (Amaranthus re roflexus L.).

Annual of European origin with long pink tap root. Erect growing plant usually much branched. The leaves are borne on long stocks or pedicels, light green in colour, ovate in shape; each leaf tipped with a bristle, stems covered with coarse hairs.

Flowers green, borne on compound spikes at the axils of the leaves and at the end of the branches. Individual flowers are inconspicuous.

Seeds are shiny, black, oval, flattened on both sides. Individual p ants often produce as high as 15,000 seeds.

It occurs in most parts of the province and is most troublesome n gardens and potato fields.

Eradication.

Mow borders of fie ds before the seed matures. Destroy plants found growing in waste places. When grain fields a e badly infested, disc stubble in the fall immediately after harvest. Harrow grain crop in spring to destroy weeds that germinate at the same time as the grain. Hand hoeing and cultivating will effectively hold it in check in gardens, etc.

FIG. XXVIII.—REDROOT PIGWEED.

TUMBLE WEED (Amaranthus graecizans L.).

A low growing bushy annual quite common in many parts of the province. It is profusely branched, the whitish stems growing out from the base in such a manner as to make the plant spherical in form. The leaves are oval, gradually narrowed toward the base, dark green in colour.

Rather inconspicuous flower clusters are borne in the axils of the leaves. When the plant reaches maturity it breaks off close to the ground and blows over the soil, distributing its seed. It is very susceptible to frost and plants that start late in the summer will be destroyed before they produce seed.

Eradicat on.

Hoe up the plants when found growing in waste places. When cultivated fields are infested, harrow the grain after it is up, at least twice to destroy the seed-bearing plants. Hand pull any plants that may be found in the crop.

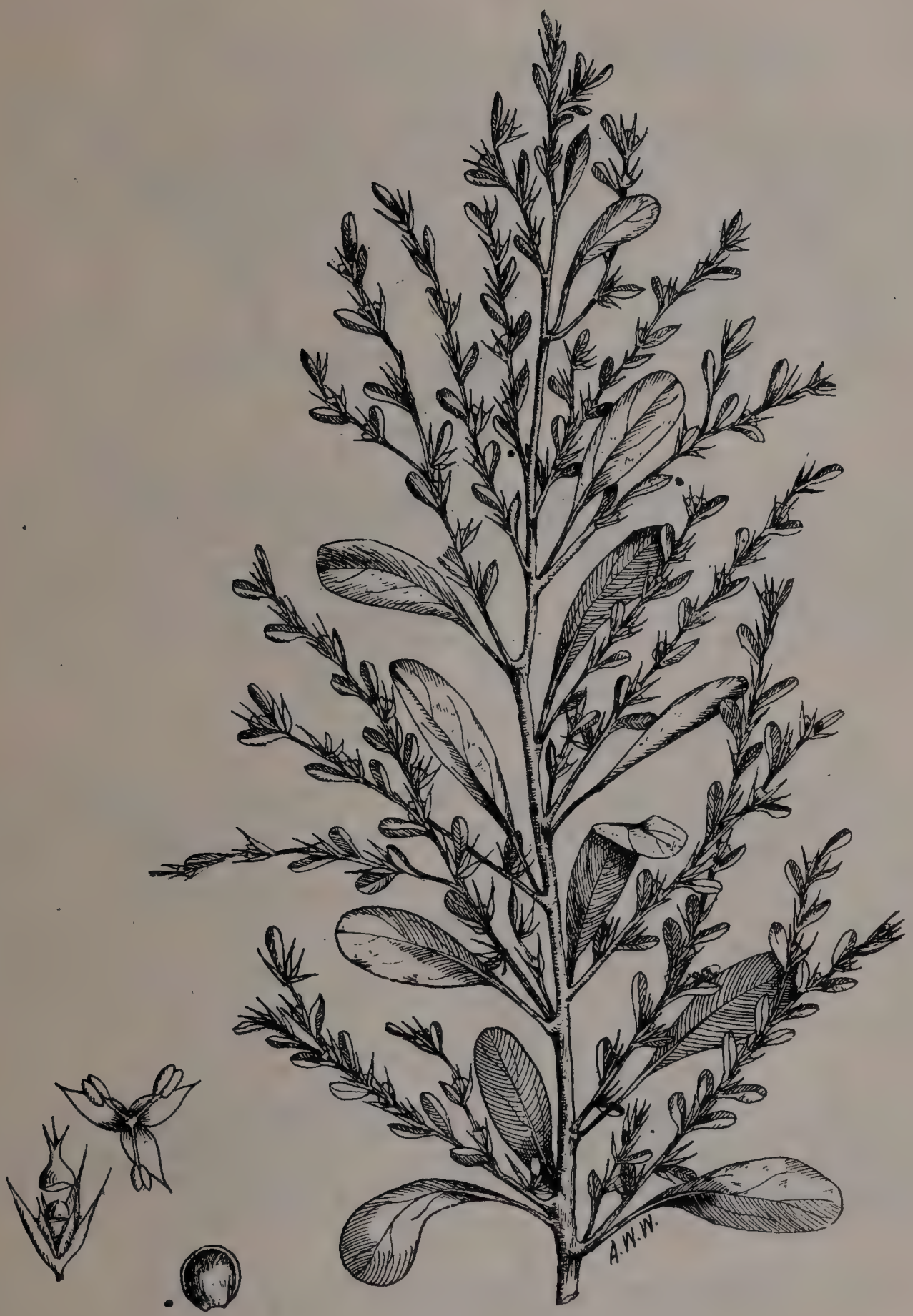

FIG. XXIX.—TUMBLE WEED.

MORNING GLORY FAMILY (Convolvulaceae).

FIELD BINDWEED (Convolvulus arvensis L.).

A creeping perennial of European origin with fleshy branching root-stocks which throw up slender stems at intervals. The stocks twine about other plants and spread over the soil upon which they are growing. Habits somewhat similar to Wild Buckwheat, but a much more serious weed owing to its perennial habits and to the fact that it is propagated by means of its root-stocks. Leaves arrow shaped, borne on rather long, slender stocks.

Flowers pink, resembling small morning glory flowers.

Seeds large, black and angular.

This weed has been reported recently at one or two points in the province, and is a very troublesome one in some localities in Ontario.

Eradication.

It is a very difficult plant to destroy owing to the vitality of its root-stocks. As this weed usually occurs in patches, thorough and continual cultivation with a wide-toothed cultivator throughout the growing season will exhaust the plants. Care should be taken, however, to clean the teeth of the cultivator when leaving the patch infested, as any roots dragged to other parts of the field will grow and spread the weed. If the patch is small it is possible to smother by covering with a straw stack or with manure to a depth of several feet.

DODDER (Cuscuta epithymum Murr.).

An annual plant with parasitic habits. It has slender, yellowish and reddish stems which twine about the clover or alfalfa plants attaching itself to them by means of suckers through which it obtains its nourishment, sucking the juice from the plants to which it is attached. This is a very serious pest in alfalfa fields when it gets a start as it spreads rapidly from plant to plant until large areas of the field will have a burned appearance. Up to the present there is not a great deal of dodder to be found in Canada, outside of a small amount in Ontario. Certain sections of the United States as well as portions of Europe, where it has been necessary to purchase alfalfa seed, are seriously infested with it.

Eradication.

Alfalfa fields should be watched closely, especially when seed has been procured from a foreign source, and when it is noticed infesting the plants, the infested crop should be cut and burned. In case a field is badly infested throughout it should be cut early for hay, before the dodder goes to seed, and then ploughed down.

WHITE SWEET CLOVER (Melilotus alba).

A tall rank growing biennial belonging to the clover family commonly found growing along roadsides and in waste places. It has never yet proved a very serious pest in grain fields. Can easily be controlled by cutting before they have an opportunity to form seeds.

FIG. XXX.—BINDWEED.

BUCKWHEAT FAMILY (Polygonaceae)

WILD BUCKWHEAT (Polygonum Convolvulvus L.)

Annual of European origin. A twining vine with branching stems and arrow-head shaped leaves.

The flowers are borne in clusters in the axils of the leaves and are greenish white in colour.

The seeds are dull black in colour and triangular in form. They usually retain their outer covering, but this is sometimes removed, giving the seed a white appearance.

This weed is troublesome in grain fields throughout the province. It twines around the stocks of grain pulling them down and making it very difficult to bind the crop. It prevents lodged grain from rising and reduces the yield and grade of grain. The seeds are very difficult to separate from grain, either in threshing or cleaning.

Eradication.

Sow clean seed. Disc the land immediately after harvesting so as to encourage the germination of the seeds on the surface. The young plants will be killed by frost. Harrowing the grain after it is up will kill the seedling plants. Thorough summer-fallowing, ploughing before the plants go to seed, and cultivating with a duck-foot cultivator at intervals throughout the summer will rid a field of this pest.

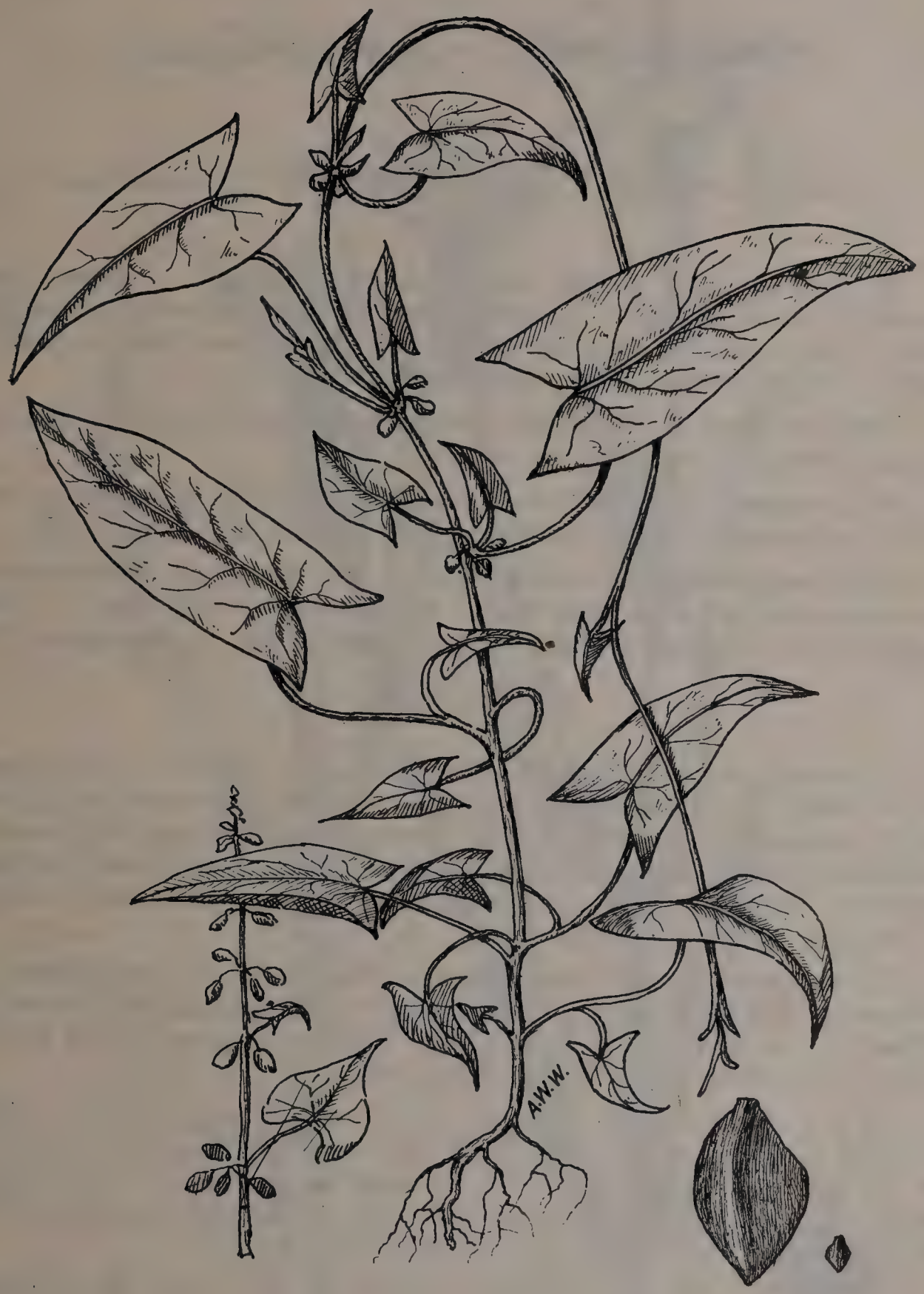

FIG. XXXI.—WILD BUCKWHEAT.

PINK FAMILY (Caryophyllaceae)

PURPLE COCKLE OR CORN COCKLE (Agrostemma Gi hago L.).

An annual and winter annual introduced into Canada from Europe. Erect habit of growth, usually from one to three feet high. Quite sparsely branched, and leaves covered with soft silky hairs. Leaves long, narrow and pointed.

Flowers borne at the tips of the branches about one and one-half inches across. Purple in colour.

Seed capsule filled with roughened black seeds about one-eighth inch in diameter. Seeds ripen during August and September.

Very common weed in wheat fields. When ground with wheat, the seeds give a bad flavour and a dark colour to the flour. It has been known to poison young chickens when eaten in large quantities.

Eradication.

Sow clean seed and hand pull when there are only a few plants in the crop. In cases where there is much of this seed in the soil, spring ploughing followed by a thorough cultivation will destroy any of the plants which may have started in the fall and lived throughout the winter. If the land is badly infested, summer-fallowing is the most effective remedy.

Avoid growing fall wheat where this weed is troublesome, as the plants will have such a firm foothold in the spring that it will be difficult to affect them by harrowing. Grow spring crops and harrow the growing grain to kill the seedling weeds.

If the land is badly infested, disc immediately after harvesting in order to germinate the seeds on the surface. Disc the land early in the spring to start the weeds as soon as possible. Plough quite deeply in June. Harrow immediately after ploughing and at intervals throughout the summer each time the weeds appear.

Hand pull any seed-bearing plants in the crop the following year.

FIG. XXXII —PURPLE COCKLE.

COW COCKLE (Saponaria Vaccaria L.).

Annual of European origin from one to two feet high. Stems erect, branching above, or much branched from the base. It is a smooth, succulent plant with opposite, ovate, lanceolate leaves which clasp the stem and have the same colour and appearance as the leaves of a cabbage.

Flowers pink, about half an inch in diameter, calyx ovate, inflated and five ribbed. The smooth rounded capsules contain about twenty round black, finely pitted seeds.

It is quite common in grain fields in the prairie provinces, where on account of its branching habits it crowds out the crops. It also absorbs a large amount of moisture from the soil.

Eradication.

Sow clean seed. On account of its peculiar appearance it can be easily seen and hand pulled when the plants are not too thick. Fall and spring cultivation will do much to hold it in check. Seeding to timothy and leaving for two or three years usually has the effect of reducing the number of plants. Thorough summer-fallowing is also effective.

FIG. XXXIII.—COW COCKLE.

BORAGE FAMILY (Boraginaceae)

BLUE BUR OR STICKSEED (*Lappula echinata Gilbert*).

Annual and winter annual of European origin. Erect branching plant thickly covered with coarse hairs. Leaves linear, oblong, basal leaves without stems.

Flowers small, one-eighth inch across, pale blue in colour, arranged in long, somewhat one-sided clusters.

Seed is about one-eighth inch long, greyish brown in colour and pear shaped. Margin covered with hooked spines. Seeds ripen in July.

Occurs in waste places and along road-sides, sometimes in pasture fields, where the burrs are very troublesome to sheep, becoming matted in the wool. It is troublesome in this province where grain is sown on stubble.

Eradication.

Continued cutting before the seeds form will prevent it from going to seed and eventually thoroughly destroy it. Grain should not be sown on stubble land infested with this weed. Plough and thoroughly cultivate for each crop. In bad cases summer-fallowing should be practised. If only a few plants are to be found, hand pulling will control it.

FIG. XXX V.—BLUE BUR.

EVENING PRIMROSE FAMILY (Onagraceae)

WHITE EVENING PRIMROSE (Oenothera pallida Lindl.).

Tall growing, native perennial with large fleshy, creeping roots, which throw up flower stems at short intervals. These usually grow singly, erect, to a height of about three feet and are white in colour, thinly covered with down at the top. The leaves are long, narrow and bright green.

Flowers large and white, formed in axils of leaves.

Not prevalent, though it has been observed growing in small quantities in various parts of the province.

Eradication.

Summer-fallowing, followed by thorough cultivation throughout the summer.

MINT FAMILY (Labiatae)

HAIRY MINT OR HEDGE NETTLE (Stachys palustris L.).

Found growing in low land, is pale green in colour, stems and leaves hairy. Leaves large and opposite.

Flowers lavender in colour, perennial in its habits with creeping root-stocks. Has been known to give trouble in grain crops in the central portions of the province during wet seasons.

Eradication.

Summer-fallow with thorough cultivation.

ROSE FAMILY (Rosaceae)

PRAIRIE ROSE (Rosa arkansana, Porter).

A native perennial found growing on the unbroken prairie in practically all parts of the province. An extensive description of this plant is unnecessary as it is familiar to almost every person. In general appearance it resembles the other members of the rose family. Its delicate pink flowers with their odour serve to identify it to the most casual observer. The prairie rose sometimes proves troublesome on land which has not been properly broken.

Eradication.

In this case the land should be summer-fallowed, ploughing fairly deeply, using a sharp share. Cultivate thoroughly throughout the season with a spring-tooth cultivator. This method followed by ploughing the land put into crop each year will thoroughly eradicate this plant.

HONEYSUCKLE FAMILY (Caprifoliaceae)

WESTERN SNOWBERRY OR WOLFBERRY
(Symphoricarpos occidentalis, Hark.).

A native shrub growing from two to three feet high on the unbroken prairie; is only troublesome as in the case of the rose when breaking has not been thoroughly done.

Eradication.

Clean summer fallowing.

THE NOXIOUS WEEDS ACT

(OFFICE CONSOLIDATION)

Being Chapter 15 of the Statutes of Alberta 1907 (Assented to March 15, 1907), as amended by Chapter 20 of the Statutes of Alberta 1908 (Assented to March 5, 1908), Chapter 14 of the Statutes of Alberta 1910 (Second Session) (Assented to December 16, 1910), and Chapter 4 of the Statutes of Alberta 1911–12 (Assented to February 16, 1912).

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Alberta, enacts as follows:

SHORT TITLE.

1. This Act may be cited as "*The Noxious Weeds Act.*"

INTERPRETATION

2. In this Act unless the context otherwise requires—

1. The expression "noxious weeds" shall include—

Tumbling mustard (*Sisymbrium Altissimum*),
Hare's ear mustard (*Conringia orientalis*),
Common wild mustard (*Brassica sinapistrum*),
Ball mustard (*Neslia paniculata*),
Tansy mustard (*Sisymbrium incisum*),
Wormseed mustard (*Erysimum cheiranthoides*),
False flax (*Camelina sativa*),
Shepherd's purse (*Capsella bursa-pastoris*),
Red root (*Amarantus Retroflexus*),
Canada thistle (*Cnicus arvensis*),
Stink weed (*Thlaspi arvense*),
Russian thistle (*Salsola kali v Tragus*),
Ragweed (*Ambrosia trifida*),
Wild oats (*Avena fatua and A. Strigosa*),
Russian pigweed (*Axyris Amarantoides*),
Blue bur (*Echinospermum Lappula*),
Tumble weed (*Amarantus albus*),
Purple cockle, and Perennial sow thistle, *sonchus arvensis, L.*, Blue lettuce, *Lactuca pulchella, D.C.*, and Cockle bur, *Xanthium strumarium, L.*

2. The expression "department" means the Department of Agriculture;

3. The expression "Minister" means the Minister of Agriculture;

4. The expression "inspector" means any inspector appointed under this Act;

5. The expression "occupant" means a person occupying or having the right to occupy any land;

6. The expression "owner" includes every person who has any estate or interest in land or grain, or who has any right to be vested with such an estate or interest; and for the purposes of this Act the council of any city, town or village shall be deemed to be the owner of all land within the boundaries of such city, town or village respectively."

7. The expression "earth work" means any dump or heap of earth, or place from which earth has been removed;

8. The expression "thresher" means any person in possession or charge of a threshing machine.

INSPECTORS AND OTHER OFFICERS.

3. The minister may from time to time appoint such inspectors and other officers as may be required to carry out the provisions of this Act, fix their remuneration and define their duties.

DUTY OF OWNER OR OCCUPANT OF LAND.

4. Every owner or occupant of land shall destroy all noxious weeds thereon, and if he makes default in so doing he shall be guilty of an offence and on prosecution therefor by an inspector or other officer, or by any owner or occupant of land, under this Act, shall on summary conviction thereof be liable to a penalty of not less than five and not exceeding $50 and costs.

(2) Weeds on public roads shall be destroyed by the local improvement district in which they are situated.

(3) White clover, timothy or western rye grass, or a mixture of all or either of these shall be grown:

(*a*) On earthworks made by railways or irrigation companies by and at the expense of these corporations.

DESTRUCTION OF WEEDS.

5. Any inspector shall have the right to enter upon any land to inspect it for noxious weeds and any one obstructing him in the discharge of his duty shall be guilty of an offence and liable to a penalty not exceeding $25 and costs, and any inspector finding noxious weeds growing in any grain or hay crop may notify the owner:

(*a*) To pull by hand or cut and burn or plow under such crop or any part thereof within a stated time; or

(*b*) To burn the straw or screenings or both from any crop or part thereof within five days after it is threshed.

6. Any inspector finding noxious weeds growing on occupied lands shall notify the occupant thereof to destroy such weeds within five days from the date of such notification.

7. Any inspector finding noxious weeds growing on unoccupied lands shall notify the owner either personally or by registered letter addressed to his last known address, if any, to destroy such weeds within five days of such notice.

8. Any inspector finding noxious weeds growing on any railway fire guard, right-of-way, or any other earth work, or any unoccupied lands owned by or forming part of the land grant to any railway company shall notify the roadmaster or foreman of that section, or the nearest station agent, either personally or by registered letter to destroy such weeds within five days from the date of such notice.

9. Any inspector finding noxious weeds growing in or upon any ditch, or other earth work, or right-of-way of any irrigation com-

pany shall notify the manager, superintendent or ditch rider of such company, or the owner or controller of any ditch or lateral ditch, either personally or by registered letter to destroy such weeds within five days from the date of such notice.

10. Any person to whom notice has been duly given under any of the preceding sections who neglects to carry out the directions contained therein shall be guilty of an offence and on summary conviction thereof shall be liable to a penalty of not less than five and not exceeding fifty dollars and costs.

11. In case noxious weeds are not cut down or otherwise destroyed on any land pursuant to any notice given by an inspector under this Act or in case the name or address of the owner of such land is unknown, the said inspector or any person or persons directed by him may forthwith enter upon the land with the necessary teams and implements and destroy such weeds in such manner as the inspector may see fit.

12. The amounts expended in the work performed under the next preceding section may be recovered from the owner or occupant of the land by action in the name of the Attorney General or the inspector or by distress by the inspector or his agents of any chattels on the land.

(2) Any such amount which has not been recovered from the owner or occupant before the first day of January next following its expenditure shall be added to and form part of the local improvement assessment of such lands as if it were an original tax and it shall have the same effect on the land and may be recovered by any of the methods available for the recovery of such taxes and the amount so recovered shall be transmitted to the Provincial Treasurer and form part of the general revenue fund of the Province of Alberta.

(3) Upon the secretary of a local improvement district receiving notice from the tax commissioner of any amount to be charged under the next preceding subsection against any parcel of land in his district he shall enter the said amount against the said land and, until it is paid, enter it in all returns to be made by him in the same manner as local improvement assessments.

(4) A certificate purporting to be signed by the tax commissioner to the effect that the amount named therein has been expended during any year for the destruction of noxious weeds upon any area of land described shall be *prima facie* evidence that the amount named has been so expended.

SALE OR DISPOSAL OF GRAIN, ETC., CONTAINING WEED SEEDS.

13. No person shall sell or dispose of, or offer for sale or disposal, or have in his possession for sale, any grain, grass, clover or other seeds intended for the purpose of seed, in which there is more than one seed of any noxious weed or weeds per ounce of such seed. No person shall sell or otherwise dispose of or offer for sale, or other disposal, any grain intended for the purpose of feed, in which there are more than ten noxious weeds to every ounce of such grain.

14. No person shall purchase or sell, barter or otherwise dispose of or remove from any premises, any bran, shorts, chopped or crushed grain or cleanings containing seeds of noxious weeds, unless the

germinating qualities of such seeds have been destroyed; and no person may at the time of marketing or warehousing his grain remove from any elevator or mill the screenings screened from such grain so marketed or warehoused, and such screenings must be burned by the proprietor of the elevator or mill:

Provided that matter containing seeds of noxious weeds may be removed in closely woven and securely tied sacks from any grain elevator or warehouse to be burned or fed to sheep if such sheep are fed and kept within enclosures which are the property of the feeders; and

Provided also that such enclosures shall be subject to inspection by weed inspectors and that lists of the parties to whom screenings are sold shall be furnished monthly to the Minister of Agriculture by the managers of the elevators or warehouses.

15. No person shall place outside any mill, elevator or grain warehouse, except in a securely constructed building, shed or covered bin, any matter containing the seeds of noxious weeds without first having destroyed the germinating powers of such seeds.

THRESHING MACHINES TO BE CLEANED BEFORE REMOVAL.

16. Every thresher shall thoroughly clean his machine, both inside and out, and all his wagon racks, immediately after threshing at each setting and before removing the machine or any part thereof to another setting.

17. Every thresher shall clean the grain threshed by him, and when it is delivered to the owner it shall contain not more than one hundred seeds of noxious weeds other than wild oats, in one thousand of grain, and all screenings containing seeds of noxious weeds shall be destroyed by the owner within five days after it is threshed or removed in closely woven and securely tied sacks.

18. Every thresher shall display in a prominent place upon his machine a card containing this and the two preceding clauses, which card shall be furnished free upon application to the department.

PENALTIES.

19. Every inspector or other officer who neglects to perform any duty placed upon him by this Act shall in respect of each instance of neglect be guilty of an offence, and liable on summary conviction thereof to a penalty not exceeding $25 and costs.

20. Violation of any provision of this Act for which no penalty is provided shall be an offence and the offender shall on summary conviction thereof be liable to a penalty of not less than five and not exceeding $50 and costs.

21. Chapter 84 of *The Consolidated Ordinances* of the North-West Territories and all Ordinances amending the same or passed in substitution therefor are hereby repealed.

INDEX

INDEX