Unlawful Iowa Weeds and their Extermination

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Unlawful Iowa Weeds and their Extermination

Abstract
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UNLAWFUL IOWA WEEDS AND THEIR EXTERMINATION

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UNLAWFUL IOWA WEEDS AND THEIR EXTERMINATION

BY L. H. PAMMEL AND CHARLOTTE M. KING

The Iowa weed law is violated in many parts of the state, partly because the farmers and some officers are unfamiliar with the law, and partly because they are not interested in the important question of weed control.

The weeds recognized by the law as noxious are:
- Quack grass, *Agropyron repens*.
- Canada Thistle, *Cirsium arvense*.
- Cocklebur, *Xanthium canadense*.
- Wild Mustard, *Brassica arvensis*.
- Curled Dock, *Rumex crispus*.
- Smooth Dock, *Rumex altissimus*.
- Buckhorn, *Plantago lanceolata*.
- Wild Parsnip, *Pastinaca sativa*.
- Horse Nettle, *Solanum carolinense*.
- Velvet-weed, *Abutilon Theophrasti*.
- Burdock, *Arctium Lappa*.

The Thirty-third General Assembly passed a law compelling the removal of certain weeds from the public highway, and from lands adjacent thereto, etc., as follows:

Section 1. Land Owners or Tenants to Destroy Weeds—When. It shall be the duty of every person, firm or corporation owning, occupying or controlling lands, town and city lots, land used as right of way, depot grounds or for other purposes to cut, burn or otherwise entirely destroy all weeds of the kinds mentioned in section two (2) hereof at such times in each year and in such manner as shall prevent the said weeds from blooming or coming to maturity."

THE LAW'S PENALTIES

The law provides also a method of procedure in case of neglect to remove noxious weeds from highways.

"Section 3. Destruction on Highways—Neglect or Refusal to Destroy. It shall be the duty of the township trustees or other officers responsible for the care of public highways in each township or county in this state to destroy or cause to be destroyed all noxious weeds mentioned in section two (2) hereof or unnecessary brush on the highways in such a manner as to effectually prevent the production of their seeds..."
or their propagation in any other manner, to warn out labor or to employ labor for this purpose in the same manner as for repairs to the highways, and for neglect or failure to perform this work they shall be subjected to the penalties in this act. If any occupant of lands adjacent to the public highways neglect or refuse to destroy the noxious weeds upon his land, or shall fail to prevent the said noxious weeds from blooming or coming to maturity, when such weeds are likely to be the means of infesting the public highway, or upon complaint of any land owner to the township trustees that his lands have been or are likely to be infested by weeds from the lands of another including railway right of way, the trustees shall make investigation of such condition or complaint and if the same appears to be well founded they shall make an order fixing the time within which the weeds shall be prevented from maturing seed, and an order that within one year such noxious weeds shall be permanently destroyed, and prescribing the manner of their destruction and shall forthwith give notice to the occupant of the lands where the noxious weeds exist, and if he shall neglect to obey such order within the time so ordered the trustees may cause such noxious weeds to be prevented from maturing seeds or may cause such noxious weeds to be permanently destroyed and the cost of the work shall be recovered from the owner by a special tax to be certified by the township clerk in the same manner as other road tax not paid.”

GENERAL SUGGESTIONS ON THE EXTERMINATION OF WEEDS

Kinds of Weeds. Three general classes of weeds must be considered.

First, annual weeds, represented by foxtail. Their seeds germinate in the spring, flower, produce seeds and then die. Their roots are fibrous, and are usually easily killed by exposure to the sun in ordinary methods of cultivation. In some few cases, as in crabgrass, roots are produced from the joints where such weeds lie on the ground.

Second, biennial weeds. Their seeds germinate one season and produce a mat of leaves, pass through the winter, and the next season send up a stem which bears flowers and seeds, and then dies. Such weeds should be cut off several inches below the surface of the ground. This should be done the first season, or before the plant has produced seed. Never cut them off at the surface of the ground. If so treated they act like perennials. Weeds of this class are represented by burdock and parsnip.

Third, perennials. This class of weeds is represented by Canada thistle, quack grass, dock, and sheep sorrel. They continue to grow year after year.
GENERAL RULES TO BE OBSERVED

1. Prevent the Formation of Seeds. This applies to all kinds of weeds. Many seeds of weeds like foxtail, and other weeds of the grass family, do not retain their vitality very long. Some, however, like shoofly, velvet-leaf or butter print, retain their vitality for a long period of years. It is essential that no seeds be allowed to form because a continuous crop of weeds will appear when the soil is brought under cultivation.

2. Always Buy the Best Seed. See that such weed seeds as dodder, buckhorn, dock, Canada thistle, chicory, carrot, and other weeds are not sown with clover and other seeds.

3. Practice Rotation of Crops. Many weeds are found in special crops. In this rotation clover should occur, because a thickly grown clover crop crowds out weeds. A pasture, in many cases, is good to reduce the number of weeds.

4. Use Due Care with the Threshing Machine. See that the machine is always cleaned when passing from one farm to another. Quack grass, mustard seeds are often carried from one farm to another.

5. Use care in transplanting hay, grain, straw and manure from one farm to another, or from the city to the farm. Quack grass and other weeds are frequently carried in this way.

6. Utilize sheep for the destruction of weeds.

7. Use some vigorous and thick growing crop to crowd out weeds. For this purpose sorghum, clover, or millet is good.

8. Give thorough and clean cultivation for corn. Cultivate as long as the corn crop will permit.

9. As far as possible plow small grain crops and corn fields in the fall. This will destroy many annuals whose seeds germinate in the fall; especially valuable for winter annuals like shepherd's purse and peppergrass.

10. Use iron sulphate for annual weeds like mustard, ragweed, and smartweed.

11. See that all weeds in waste places are removed. This will prevent their spread to cultivated fields.
QUACK GRASS

This weed is also known as quitch or quick grass but the Iowa farmers know it generally by the name of quack grass. It is a bright green, rarely glaucous green, perennial, spreading by means of its underground rootstocks commonly called "roots"; the sheaths are generally smooth though occasionally somewhat hairy; leaves slightly less roughened than the western wheat grass, which although much like quack grass has glaucous green leaves which are very rough on the margin. The flowers are borne in "heads" which vary in length from a few inches to ten inches. Each separate part of the "head" is called a spikelet which is about 5-flowered; "chaff" 3/10 to 4/10 inches in length, acuminate or awn pointed, smooth or more or less scabrous, the lower of the scales (lemmas) inclosing the seed, the outer, strongly nerved, terminating in an awn. The rootstocks are yellowish straw-colored or greenish yellow; in ordinary cultivated soil in Iowa usually found from the surface soil to a depth of four inches, or occasionally to a depth of six or seven inches; in meadow two and three inches below the surface.

Western wheat grass in its habits of growth, rootstocks and head, resembles quack grass, but may readily be distinguished by its thicker heads, larger spikelets, and scabrous leaves which are decidedly bluish in color. It is not as difficult to exterminate as quack grass. This grass is very common along railroads which have largely been responsible for its spread in Iowa. This grass is very nutritious and is a most desirable grass for sandy soil and places subject to washing.

Various methods have been given for the extermination of quack grass. The following methods have been found effective: sorghum method, summer fallow, pasture and meadow land and tarred paper method; of these the sorghum method is the most effective.

Summer Fallow.—The summer fallow method has been tried to a limited extent in Northern Iowa. The land is plowed in the spring, disked and harrowed at least once each week during the entire season; the frequent cultivation brings the roots to the surface and the direct
sun destroys them. This method means a loss of the crop and is not to be recommended for expensive Iowa meadow and pasture land. When meadow or pasture has been down for several years the root-stocks are found much closer to the surface of the ground than in cultivated fields. In order to destroy quack grass the sod can be cut to a depth of about three inches. Mr. Cates recommends for this purpose a Scotch-bottom plow which has a very long, gradually sloping moldboard. With this type of plow the sod can be given very shallow cultivation. In a week the disk should be used. When the disking is thoroughly done repeat the operation in a week or ten days continuing this during the dry weather of the fall. This will probably kill a vast majority of quack grass roots. Where this method has been tried it has been found very good, leaving the soil ready for a crop the next season.

Tarred Paper Method.—Tarred paper method is advisable where there is only a small patch of quack grass. In laying down the tarred paper the edges should be over-lapped carefully to exclude light. One should be careful also to let the tarred paper extend some distance beyond the quack grass as the quack grass roots are sometimes three feet long. Six weeks of hot weather will kill them out. In this connection it may be well to state that a covering of straw or manure is frequently used in bringing the roots to the surface where there has been shallow cultivation, the roots then being destroyed.

Sorghum Method.—When this method is used, especially where the quack grass has been in small grain, the infested ground should be given a shallow plowing as soon as the oats, wheat, or barley has been cut. Plow shallow and disk exposing the roots to the sun. As soon as the quack grass comes through the ground harrow the field; repeat this as often as may be necessary through the months of August and September as these months are frequently dry. This will help to destroy a large number of roots for the next season. The next season, when the soil is in good condition, sow sorghum at the rate of 1½ to 2 bushels per acre. The sorghum will crowd out the quack grass. This method has been tried successfully both on the College Farm, and elsewhere in the state. There is no other method as good as this.

In some cases it has been found advisable where the "roots" are abundant in the field to rake them up and burn them. An absolutely clean culture throughout the entire season, while preventing the growth of leaves which make the food of the plant to be stored in the roots, while effective, is rather an expensive method.

CANADA THISTLE

The Canada thistle can be treated with the sodium arsenite. No other chemicals, so far as our experiments extend, will entirely destroy this weed. Carbolic acid only partially destroys the roots and the plants shoot up again from below the point of injury, but by repeating the process the Canada thistle can ultimately be exter-
minated. A good method to eradicate the weed is to plow shallow and cultivate frequently during the summer. The roots of the Canada thistle extend deeply down into the soil, hence for this reason deep cultivation will be of no avail. After plowing, the soil should be dragged and the roots exposed to the sun and removed, when possible. It may be necessary to run over the field with a hoe to cut off the stray plants which appear. This method was tried on a patch several years ago and no Canada thistles have since made their appearance in this place. Various crops, such as clover and sorghum, are said to be effective in subduing the thistles.

Of the various chemicals which have been used to exterminate Canada thistles none is more effective than sodium arsenite. It is applied at the rate of one and one half to two pounds to 52 gallons of water. This will destroy all vegetation. It is very poisonous and stock should not be allowed upon areas treated with it for a long time.

Carbolic acid at the rate of one part to one part water destroys the root where it comes in contact with the mixture, and for a little distance beyond. This is not an effective method, as the roots sprout out from below. Use due care in handling carbolic acid.

In response to circulars of inquiry sent out by the Iowa Experiment Station, the majority of correspondents recommended shallow plowing, disk ing, and harrowing; and continuing cultivation and hoeing as long as the thistles make their appearance. Some report successful treatment with salt when scattered thickly about the thistles, especially
if cattle or sheep are given access to it. Some report success with carbolic acid where it is applied directly to the stem. Tarred paper in a few instances gave success, as did also the method where the thistle was covered thickly with straw or manure. The depth of covering was not, however, given.

COCKLEBUR

The cocklebur is a serious menace to cultivated crops in many parts of the state, more especially in southern Iowa. A large number of queries sent out to farmers in different parts of the state brought many responses. Nearly every correspondent reported the weed. The seed habit of cocklebur differs materially from that of many annual weeds that belong to the same family. The bur has two so-called seeds, one of which has a slightly different position from the other; the seed coat, too, is slightly different in structure and, according to Dr. Crocker, this is the reason for delayed germination. Dr. Arthur in a study of the seeds, determined that the opinion generally prevailing, that one seed will germinate one season and the other the following, is essentially correct. We have found in our own work that occasionally both seeds germinate the same season. It is very plain, therefore, that if cocklebur occurs in the soil you can not hope to destroy more than about one half of the seeds in one season, and if the same field is cultivated with corn the next year, another crop of seedlings will come on. How long the seeds will retain their vitality has not been definitely
determined. The best method of combating the cocklebur is the rotation of crops and clean culture. When a field is in corn, the field should be thoroughly cultivated and none of the plants allowed to mature seed. If they can not be caught by the cultivator, it may pay to kill the remaining plants with a hoe, or to pull them by hand. The corn should be followed with winter rye and then oats, using the oats as a nurse crop for clover and timothy. Leave the field in meadow for at least two years and then if possible turn it into pasture. This certainly eradicates the cocklebur, ragweed and many other annual weeds.

MUSTARD

The first and most important consideration in connection with the extermination of mustard is that the oats or wheat should be freed from mustard seed. Then this grain should be sown on clean fields, preferably fields that have been in pasture or meadow. Nothing has done so much to remove the weeds from the fields of northern Iowa as the pasture and meadow. If the grain is sown in a corn field there should have been no mustard the previous season. Having sown the small grain on a clean field there is always a chance that some of the seeds will retain their vitality in the soil. If much of this should come up it may become necessary to spray it with iron sulfate. Where the mustard is abundant this is a very effective means of destroying the weeds, using the sulfate at the rate of one hundred pounds to a barrel of water.

MILKWEED

Milkweed, like the morning-glory, is a deep-rooted perennial and where abundant in small grain fields it is rather difficult to remove. The plowing here should always be shallow, as the roots are deep seated and new plants spring up from where the roots are cut off. The plowing should be followed by disk ing and harrowing to expose as many of the roots as possible and the field should be turned into pasture as soon as possible. It is seldom that milkweed becomes injurious to pastures as the plants lose their vitality. It is by continuous
cropping with one crop that the weed becomes pernicious in its character.

In response to a query sent out, one correspondent recommended oats one year, clover one year, corn two years, saying the weed is not troublesome in the pasture after the second year. Some have advocated pulling the weed by hand. This is not practical.

THE DOCKS

Description.—The sour or curled dock, and the pale dock are at times troublesome as weeds. Curled dock is a smooth perennial from three to four feet high, leaves with strongly wavy and curled margins, lanceolate and acute. The lower leaves inclined to be heart-shaped at the base. The flowers are arranged in dense whorls prolonged into racemes, leafless above but with small leaves below. The fruit is brown, and three-angled. The pale dock occurs in low ground, and is from two to six feet high. The leaves are pale in color, longer than in the curled dock, and the edges are not wavy. The long, spike-like panicles are nearly leafless. Both species have become common in the state. They are perennial weeds; curled dock may be easily rooted out by hand when the soil is wet. When very abundant it is sometimes well to use the spud or to plow.
BUCKHORN OR RIBGRASS

This weed was widely scattered in this state prior to the passage of the Iowa seed law, and probably will be found in many different counties. It is extremely common in the east. This weed is a perennial, or possibly in some cases a biennial, with a short root-stock and numerous narrow, lance-shaped leaves, with brownish hairs at the base. These leaves usually form a rosette. The flower-stocks are at first short. The head looks something like the head of timothy, having at first a yellowish color due to the anthers of the stamens. The seeds are chestnut-brown, polished, with a groove on one side. It flowers during the entire season, from May until frost. In England the plant is used to some extent for forage purposes, but its quality is not very high.

Sow clean seed in clean soil and there will not be very much danger from this weed. We would recommend that a clover meadow badly infested with it be turned under before the seeds have matured, soon after the first crop of clover hay is cut. Then follow with a corn crop. There is no practical way of separating rib-grass seed from clover seed. Clover seed containing ribgrass is, therefore, difficult to sell and will not bring the price of seed free from this weed.

WILD PARSNIP

This plant has become a common weed about meadows and gardens. It is a tall plant, with thick grooved stem, long, cut-toothed leaflets, a wide spreading umbel of yellow flowers and a deep root which has poisonous properties according to some authorities.

The wild parsnip is one of the biennials, and may be killed by deep cutting either in the fall or before the plants bloom in the spring.
HORSE NETTLE

In southern Iowa the horse nettle is one of the most troublesome weeds to deal with. Like morning-glory and milkweed it is a deep rooted perennial. The roots are known to extend into the soil as much as three to four feet. The cultivation here should be shallow. When the weed is common, disk thoroughly and harrow, exposing the roots. When a field is covered with it, it is better to summer fallow, then cultivate thoroughly and hoe during the entire season, or sow with oats, plow when harvested; disk and harrow for the remainder of the season. Follow with a thick growing crop like sorghum or rape. The method used for Canada thistle may also be applied.

MORNING-GLORY

The morning-glory, though a troublesome weed in many parts of the state, does not seem to be quite as pernicious in its character as quack grass. In response to the queries sent out it is found that the best treatment that can be given the morning-glory is to turn it into pasture. Cattle, sheep and hogs are very effective in keeping this weed down. One writer states that by keeping it in pasture four or five years the weed is killed. As to cultivation, this should be thorough. The plowing should be done as soon as the grain is removed in July or August, but it need not be deep, as the roots extend several feet into the soil and can not be reached by plowing. Where the weed is common the plowing should be followed by disk ing and harrowing.
and the roots should be exposed to the sun. One correspondent recommends corn, oats, and pasture. Another recommends millet, sorghum, and buckwheat as effective in the destruction of the weed. When a cornfield contains a considerable amount of the morning-glory the cultivation must be frequent and the hoe should follow the cultivation, especially to destroy the plants which make their appearance around the hills.

**INDIAN MALLOW OR BUTTER PRINT**

Much complaint has come to us about Indian mallow or butter print. This weed, which is very common in many parts of the state, is of course readily destroyed by cultivation. The only trouble is that so much of the seed retains its vitality for a considerable length of time. Ewart found that some seeds of a variety of this weed germinated after half a century. One difficulty encountered is that the small plants coming up after corn is “laid by” produce seed to sow the soil. The best treatment for this plant is to get the field into meadow or pasture, leaving it in this condition for a number of years and then planting to corn and following the usual rotation.

![Indian Mallow](image)

*Abutilon Theophrasti.*
BURDOCK

This is one of the common weeds of Europe and America, being found about fields, gardens, and roadsides.

It is a coarse branched biennial from one to three feet high; leaves large, heart-shaped, whitish beneath; heads of purplish or whitish flowers in clusters. The heads are covered with hooked barbs, or tips, and may prove to be a serious annoyance to animals by clinging to their hair and fleece.

The burdock bears fruit the second year and continues to flower till frost. The seeds are light brown marked by darker spots and lines.

This weed is easily destroyed by cutting out the crown some time during the early summer.

WILD TIMOTHY OR DROP-SEED GRASS.

This station has received many letters complaining about this weed. The character of the "roots" is so different from that of the roots of quack grass and the other perennial weeds that, as we have mentioned before, it is not difficult to exterminate. The roots of this weed and the allied species are more or less clustered. In an experiment conducted to exterminate this weed we found that by giving a shallow plowing of four or five inches and, harrowing to expose the roots to the sun, they were killed, no growth making its appearance during the rest of the season. Of course this is not effective during rainy weather, and it may be necessary to cultivate two or three times during the summer and fall.
SQUIRREL-TAIL OR WILD BARLEY

Squirrel-tail or wild barley is a most pernicious weed along road sides and in pastures and meadows; pernicious because it not only prevents the growth of the better grasses but it is injurious to live stock. As this weed is most common in the pasture, the best way to treat it is to mow the pasture before the grass has matured its seed. Since this weed is an annual, or winter annual, this would effectively dispose of the plant were it not for the fact that the seed is blown in from neighboring fields and road-sides. Cultivation will readily destroy the weed and where it is abundant in fields shallow cultivation followed by the disk and harrow should be effective.

FOXTAIL

It is not generally recognized, but it is doubtless true, that more money is spent in the extermination of foxtail than of any other class of weeds we have in the state of Iowa, yet they are all easily destroyed. One of the best and most effective methods of destroying the foxtail is by plowing the small grain field as soon as the grain is removed. If this is not done a large amount of seed is produced. After this plowing in the fall the field should be disked and harrowed in the spring and then planted to corn. The corn should be cultivated as frequently as possible, at least four or five times. This method should prove effective for the destruction of foxtail and pigeon grass.
SHOOFLY

Shoofly or bladder ketmia has long been known as a troublesome weed in some parts of the United States, especially southward. At one time it was widely scattered by seedsmen because it was cultivated for ornamental purposes. It is a low, rather hairy annual, with the upper leaves three-parted. The large, sulphur-yellow flower with a black spot, surrounded by a loosely inflated calyx, renders it easy of detection. Flowers do not remain open very long. The seeds are blackish, kidney-shaped, and roughened.

One correspondent writes that he has tried to exterminate this weed by keeping his ground clean, but the weed kept coming up. The weed is not difficult to exterminate, but the great trouble with this and the Indian mallow, is that the seeds retain their vitality for a long time. How long has never been determined, but there are evidences that the weeds will spring up for years after they have once gotten into the soil. We would suggest, when the weed is common, that thorough cultivation be given and that it be followed subsequently with a pasture crop. The pasture crop will subdue the plants or keep them down.

CHICORY

Chicory has long been recognized as a troublesome weed in the east, but it is only in recent years that it has attracted attention in this state. It is common in alfalfa growing sections of the country as well as the clover sections. The plant is easily recognized by the blue flowers and lower root leaves, which resemble those of the common dandelion. The upper leaves are more or less sticky and clasp the stem. The plant contains a milky juice. Chicory is not difficult to destroy where rotation of crops is practiced. Though a perennial, the roots are easily killed by successive cultivation.
DODDER

Two species of dodder have been widely scattered in this state, namely, the clover dodder and field dodder. The dodders are easily recognized by the twining habit of the plant. They are leafless, excepting for small scales on the stems, and the plant is of a reddish or yellowish color. The dodder plant pierces the clover or alfalfa and takes its nourishment from the plant on which it occurs. This parasite spreads so rapidly that under favorable conditions a large area may be destroyed in a short time.

Where this parasite occurs the patches should be mown with a scythe and the material burned. Where a field is badly infested the whole growth should be plowed under after the early crop is removed, before the dodder has gone to seed.

Plant only clean seed.

WILD CARROT

Wild carrot has become more widely distributed with clover seed than any other weed in the state. It is an extremely common weed in the east where it has long been known as troublesome to crops. Wild carrot is a biennial with bristly stem, finely divided leaves, and numerous white flowers in umbels. After flowering the flower stalks bend inward, becoming strongly concave. The seed is flattened with marginal bristles. In commercial seed these bristles are often broken off.

This weed is a most objectionable one in the meadow and pasture. It is not, however, difficult to exterminate when taken in time. Thorough cultivation before sowing the crop, and thorough cultivation of the corn field, will destroy the weed. Do not permit any of the plants to go to seed in the clover or timothy meadow.