Dear President.

University of Chicago.

Doctor of Chemical Physics.

May I be the bearer of the

On the occasion

On the occasion

On the occasion

Wish you for the

Wish you for the

Wish you for the

Wish you for the

Wish you for the
WEEDS MENTIONED IN THE WISCONSIN WEED LAW OF 1884-5, AND SEVERAL OTHER WEEDS.

By A. B. Seymour.

THE WEED LAW.

[No. 617, A.] [Published April 7, 1885.]

CHAPTER 233.

AN ACT relating to the duties of overseers of highways.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. Every person and corporation shall destroy upon all lands which he or they shall occupy or control, all weeds known as Canadian thistles, burdock, teasel, white daisy and snap dragon at such time and in such manner as shall effectually prevent them bearing seed. In like manner shall he or they also destroy any of the above mentioned weeds standing or growing as far as the center of public highway, lanes or alleys adjoining the lands owned or controlled by him or them.

SECTION 2. If the occupant of any such lands shall fail to destroy such weeds as so required, after having six days' notice in writing by the commissioner of Canadian thistles, such occupant shall be fined five dollars for the first offense, and ten dollars for each offense thereafter.

SECTION 3. There shall be appointed by the town supervisors of each town or by the city council of any city as the case may be, some competent person styled "commissioner on Canada thistles," who shall be required to take the same oath as town officers, and shall hold his office for one year and until his successor is appointed and qualified. The board may for any good cause remove said commissioner and appoint a successor to serve during the unexpired term.
SECTION 4. The commissioner shall carefully inquire concerning the existence of noxious weeds in his township or precinct, and in case any person, persons or corporation occupying or controlling any lands within this state shall neglect to destroy any Canada thistles, burdock, teasel and snap dragon growing on any lands owned or controlled by him or them, or on any highway, lane or alley adjoining such lands, it shall be the duty of the commissioner to destroy, or cause to be destroyed, all such weeds. He shall spend as many days as the supervisors or city council may deem necessary, and for each day so spent shall receive one dollar and a half per day and one-half of all fines collected, upon presentation of his account therefor verified by his oath and specifying by separate items against each piece of land, describing the same; and the respective amounts shall be placed on the next tax roll in a separate column headed for "destruction of weeds," as a tax against the lands upon which such weeds were destroyed, and be collected as other taxes.

SECTION 5. It shall be the duty of the chairman of every town board at the annual town meeting of each year to read aloud to such meeting the whole of this act.

SECTION 6. All previous acts in relation to noxious weeds and all amendments thereto are hereby repealed.

SECTION 7. This act shall take effect and be in force from and after its passage and publication.

Approved April 3, 1883.

Any writing intended to be read and understood by all people, should if possible be written in words familiar to all, and technical terms should be excluded or explained. This is especially true for so important a document as a weed law, which may affect the interests of every farmer and land owner in the State. The law-makers of Wisconsin are to be commended for their good intention in this regard, but while in the weed law they excluded scientific names, they used for the weeds common names, which have to their readers an uncertain meaning, and mean different
things to different persons. So instead of clearness they produced obscurity and confusion. The use of the name Snapdragon in the law is entirely wrong. The true Snapdragon is never a weed in Wisconsin. Probably Toad-Flax (Linaria vulgaris) was meant.

Many persons have been in doubt as to what the law meant by Teasel. The true Teasel is not common and is unknown to most persons. Many thought that the Cocklebur (Xanthium) was meant. The Daisy Fleabane (Erigeron) appears to be taken by some for White Daisy.

In general, the common names of plants are carelessly used and have indefinite and variable meanings. To one person a certain name means one plant, to another, another plant. Names are very differently used in different parts of the country. The same plant has different names in different places.

There has been much discussion through the state about the meaning of the weed law, and some difficulty has resulted from its obscurity. The scientific name always determines the plant with certainty. If a botanist had been consulted and the correct scientific name inserted together with the common name, the law would have been just as plain to every person and any question that might arise could be settled at once by any good botanist. As it stands now, the best botanist can do no more than conjecture in one case, and the average reader is unable to understand the law.

The weeds that most need to be exterminated in Wisconsin are:

Canada Thistle (Cirsium arvense, Scop.).
Common Thistle (Cirsium lanceolatum, Scop.).
Burdock (Lappa officinalis, All.).
Ox-eye Daisy (Leucanthemum vulgare, Lam.).
Cocklebur (Xanthium strumarium L.).
Beggar's Lice (Cynoglossum Uorisoni, D C.).
Couch-grass (Triticum repens, L.).
STRUCTURE OF THE FLOWERS OF THE COMPOSITE OR SUNFLOWER FAMILY.

The flowers in this family have a complicated structure, which needs to be explained here because the family includes so many of our weeds. Here belong the Thistles, Ox-eye Daisy, Cocklebur, Burdock, Rag-weed and many others. They were said by the old botanists to have compound flowers, but modern botanists use the term composite, instead.

In the Dandelion, a hollow stem without leaves comes up and bears what is commonly called the flower. This is not a single flower, as it appears, but a cluster of small flowers. In such plants as the Lily, Wild Rose, Apple and most of our common plants, the flowers are plainly distinct from each other and independent in structure. Each flower has a green outside covering called the calyx, then comes the colored part or corolla, and in the center are the stamens and pistils. The pistils produce the seeds, the stamens produce the dust-like pollen to fertilize the seeds.

But in the Dandelion, which may be taken to illustrate the Composite family, the flowers are very small and form a dense cluster or head. The head is surrounded by a row of green parts resembling the calyx, so that the cluster looks much like a single flower and is often called so popularly. Each of the little flowers has all the parts of any perfect and complete flower. The calyx takes a peculiar form and appears as numerous fine, white hairs, which enable the ripe seed to float in the wind. The yellow part of the flower, which is the corolla, is flattened out, strap-shaped. So there are as many flowers in the head as there are of the yellow, strap-shaped parts. At the base of each of these arise the stamens and pistils. The stamens are five, united into a tube around the pistil. The pistil has a long, slender style, projecting through the ring of stamens and two-branched at the end.

There are many variations of this structure. In many plants, including the Thistles, the calyx takes the form of slender bristles. In others there are a few teeth, which may
or may not fall off easily. Sometimes the teeth are barbed and adhere to clothing, as in the Beggar-ticks or Spanish Needles (Bidens). The colored parts (corollas) may all be strap-shaped as in the Dandelion or all like slender tubes as in the Thistles and Iron-weed, or the central ones tubular and the outer ones strap-shaped (ray flowers) as in the Ox-eye Daisy, Sunflower and Compass-Plant (Silphium). They also differ as to their stamens and pistils. In the Ox-eye Daisy, all the flowers have pistils and produce seeds, but the ray flowers have no stamens. In the Sunflower, the ray flowers have no stamens and an imperfect pistil and produce no seed. In the Compass-Plant, the ray flowers have no stamens but the pistils are perfect and produce seeds; the tubular flowers have stamens, but the pistils are imperfect and produce no seeds.

In some species the staminate and pistillate flowers are on different plants or, as in the Cocklebur, in different heads on the same plant.

Three of the five weeds mentioned in the law, Canada Thistle, Ox-eye Daisy and Burdock, belong to this family.

**Canada Thistle (Cirsium arvense, Scop.)**

*Methods of Extermination.*

The Canada Thistle is universally considered the worst of weeds and is one of the most difficult to exterminate. The number of methods for extermination proposed is in proportion to the difficulty of the task, and as would be expected they are good and bad, and one that succeeds in one case fails in another. The efficacy of any method depends largely upon the intelligence, thoroughness and energy with which it is carried out.

It is well known that salt in quantity kills vegetation. It is often sprinkled on brick walks to stop the growth of grass in the crevices. The same method is applied to Thistles, but with varying results. A considerable quantity is needed.

Prof. L. H. Bailey, Jr., recommends a quarter of a pint to each plant, but says he has known it to fail as often as to succeed. If in a pasture, the cattle are always salted on the Thistle patch, the chance of success is greatly increased. If
scattered broadcast, one bushel to four square rods is recommended. Or salt may be applied as strong brine poured around each plant.

There are many chemicals which would doubtless destroy the weed, one is sulphuric acid; but they are too expensive.

Seeding down and mowing frequently is a favorite and quite successful method, especially in soils that will produce a heavy sod. The sod occupies the soil and gives the thistle little opportunity to grow, while the mowing keeps them nearly deprived of green leaves. As these are essential to the production of the plant's food, the supply of nutritive material is at length used up and the thistle is starved to death. If the tops or leaves are allowed to make any considerable growth between mowings, the method is likely to prove a failure; for as soon as a green leaf appears, the supply of food to the roots is re-commenced at once. Mowing once a year does little or no good. It may prevent seeding but will not hinder much the growth of the underground stems, in which the obnoxious character of the plant so largely lies.

In one case reported, a farmer, finding a patch of Canada Thistles in his wheat field, fenced the spot and turned in some hogs. The weed was soon rooted out and he had no further trouble.

The surest and best method of all is clean culture, and culture sufficiently clean for this purpose can scarcely be made if a crop is raised at the same time; for some plants will be overlooked or grow so close to the hills of the cultivated crop that they will not be cut out. Let the crop go for one season and simply keep the weeds down. Do not allow them to make any growth above ground. The green leaves rapidly transform the elements of soil and air into fresh food materials, but without the green parts none can be supplied. If growth continues without them, the food supply stored in the subterranean portions will become exhausted and the plants must die.

Prof. L. H. Bailey, Jr., in his “Talks about Weeds,” in the American Cultivator, writes as follows: “A summer fallow is an expeditious means of eradicating Thistles. If they are turned under deeply and completely, and the operation re-
peated as often as the Thistles begin to show themselves — once a month or oftener — one season will usually serve to eradicate them, especially on heavy land, where the smothering is more complete. Lighter lands should be turned oftener and deeper. The plowing must be done thoroughly, with a slow team; a balk in a furrow must be covered. Many farmers can testify to the success of this treatment."

The *New York Tribune* gives the following:

"To Mr. C. W. Palmer, of Western New York, much of the needful and beneficent discipline of life came in the common form of Canada Thistles in clover seed. Thus his farm became stocked, thirty years since, with this 'worst of weeds.' He tried many ways to get rid of them — mowing, hoeing, salting, etc. — but the plague multiplied until he had 'thistles in wheat, thistles in oats, thistles in corn, thistles in grass, thistles in everything raised.' But now his hundred acres of land, that 'five years ago was a complete mat of them' is wholly clear — the result of treatment mentioned in *The Germantown Telegraph*:

'Plough the ground in June, drag in July twice and then gang-plough three times during August two or three inches deep, harrowing the ground every time. I plough with a spring-tooth harrow. Any tool that will cut off the tops the first, second and fourth weeks in August certainly uses them up here completely. No half-way work will kill them. The tops must be cut off three times in August. A wet season is just as good as a dry one; only do it and do it well.'

"Mr. J. C. Plumb received in Wisconsin seed of Canada Thistle with a package of trees from the east, and tells *The Western Farmer* his experience in getting rid of the resulting plague-spot, by the simple process of repressing the breathing organs of the plants:

'Ve carefully cut, hoed and ploughed them for the next two years, when we found they had increased from a square yard to a square rod. We then cleaned off every tree and bush from the infested ground, and gave orders to every man and boy to watch that spot and not let a living plant show above ground. This was done so effectually, by look-
ing it over once or twice a week the first summer, that only
a trace of the plants was visible the next year, and before
midsummer they were utterly destroyed, never to reappear.
Such, and such only, can we recommend as a specific for
this pest of the farm.'

And the New England *Homestead:*

"Canada thistles are one of the most easily exterminated
weed pests we have. Cut at any time in hot weather and
kerosene poured on the roots will kill them every time.—
C. B., Ellington, Conn.

"Canada thistles can be killed in one year by salting stock
on them for one summer. Cut them off even with the
ground, put salt on every one, and as often as they appear
salt again. I killed a good-sized patch in that way in one
summer, and they have never showed up since.—C. B.
Jones, Delavan, Wisconsin."

*Structure.*

The Canada Thistle has a long creeping underground
stem or rootstock, and it is by means of this that it forms
large patches and is able to make itself so obnoxious. This
rootstock lives from year to year, extending laterally in
all directions and growing down below the depth of ordi-
nary plowing. It sends up branches to the surface which
bear the so-called root leaves, and finally, if undisturbed,
ordinary leafy stems and flowers.

The leaves are of a brighter green and rather thin as
compared with other thistles, and they are cut into numer-
ous divisions and teeth, each of which terminates in a sharp
bristle. The radical leaves are the larger. Those developed
after the Thistle has been cut down are apt to be unusually
large and luxuriant; one not familiar with this fact, might
be in doubt about the identity of the plant. The stems
grow from one to three feet high and the branching top
bears numerous heads of purple flowers.

The Common Thistle (*Cirsium lanceolatum*), has some-
times been mistaken for the Canada Thistle in regions
where the latter does not occur; but the two are so unlike
that after once seen they can never be mistaken for each
other. The Common Thistle is usually much the larger and stouter and has prickly ridges or "wings" running down the stem from the bases of the leaves. The heads of purple flowers are larger and armed with strong prickles, and the leaves are armed with very strong prickles. It lives two years and produces its flowers the second year. It is a very undesirable plant and should be exterminated, but it is neither so troublesome nor so difficult to deal with as the other.

Fig. 1. Canada Thistle (Cirsium arvense).

The Canada Thistle differs in its smaller size, smooth stems, weaker prickles, and the heads of the flowers are smaller and less prickly than those of any other thistle in this country.

There are several other kinds of thistles, but none are very common unless it be the Cirsium discolor, which has the under surface of the leaves white with wooly hairs.

Dissemination.

The Canada Thistle spreads locally by means of its running rootstocks. It may spread from a single plant and at length cover a whole field. In the heavy prairie soils of our western states it spreads more slowly than in the lighter, more sandy soils of the east, hence it is much less troublesome here. Cutting the rootstocks hastens the spread-
ing, since it makes so many independent plants. Some of the pieces may be carried by the plow to a new place. Each piece grows with vigor, and thus for each break there is a new plant. Latent buds are forced into activity and new stems and leaves are formed.

A hundred years ago William Curtis, of London, gave the following account of an experiment with Canada Thistle or Field Thistle, as it is called in England. “I planted in a garden a piece of the root of this Thistle, about the size of a goose quill, and two inches long, with a small head of leaves, cut off from the main root as it was springing out of the ground. This was done on the first of April; by the second of November following, this small piece had thrown out shoots several of which had extended themselves to the distance of eight feet. Some had even thrown up leaves five feet from the original root. Most of the shoots were about six inches under ground; others had penetrated to a depth of two and a half feet. The whole together, when dug up and washed from the earth, weighed four pounds. In the spring following it again made its appearance, on or about the spot where the original piece was planted. There were between fifty and sixty young heads, which must have sprung from the roots that had eluded the gardener’s search, though he was particularly careful in extracting them.”

A Thistle head is not a single flower, but a cluster of numerous small flowers. Each has a long and slender tubular corolla with five slender lobes at the top representing the fine petals. Each flower, when fertile, produces one seed and therefore a fertile head of flowers produces many seeds. Professor Brewer estimates that a single plant may produce ten thousand seeds.

But it is well known that the Canada Thistle has two kinds of flowers which occur on separate plants. Professor Bailey found that one kind produces thick or bushy heads in which the flowers have perfect stamens but imperfect pistils, and only occasionally produce a seed. The other produces more slender heads in which the pistils are perfect and the stamens imperfect. These may produce seeds if there are any of the other kind in the vicinity to furnish
pollen to fertilize them. The staminate form seems to be
the commoner and seeds are seldom found. The only way
in which the Thistle is likely to be brought from distant
places is by means of seeds, and this must occur less fre-
quently than is usually believed; yet it does occur. Cases
are reported where the seed is brought in straw, clover seed,
a shipment of trees, etc., and there are endless ways in which
it may occur when the seeds are produced.

History.

The Canada Thistle has been a weed in Europe for cen-
turies. How it was brought to America is unknown, but the
fact that it came to the eastern states from Canada is un-
questioned. The first mention of it in the United States was
found by Professor Bailey to be in the unpublished diary of
Pursh, a well-known Siberian botanist, who traveled in this
country during the first decade of this century. He records
it (entirely new to him) at the lower end of Lake Cham-
plain in 1807, and afterwards mentions it as occurring at
Rutland, Vermont. By 1814 it had spread southward to New
York city and eastward to Boston. In 1828 it reached
Chester county, Pennsylvania, where it was introduced in
Timothy seed; but it did not spread so rapidly there as further
north. Since that time it has become distributed over the
northern states.

BURDOCK (Lappa officinalis, All.).

No other plant is ever known to be mistaken for this one.
It is a large, coarse weed, growing from two to four or even
six feet high. The germinating seed grows the first year
into a strong plant, but produces no flowers. The stem dies
down after having stored up a large amount of food mate-
rial in the roots for the second year's growth. The second
year it makes a vigorous growth from this root, produces
flowers and seeds, then dies, root and branch. During
growth the stout stem branches, forming a bushy mass of
vegetation. The root leaves are very large, one or two feet
long and half as broad or more, with a toothed and wavy
margin. The leaves on the stem are gradually smaller toward the top. The under surface is covered with cobwebby hairs.

Fig. 2. Burdock (Lappa officinalis).

It belongs to the Composite family and has the flowers clustered in dense heads surrounded by scales. The head contains numerous little tubular purple flowers, all alike and perfect. The scales forming the involucre around the outside of the head are numerous and closely appressed at the base, but with slender, bristle-like spreading tips, each of which is curved inward at the end, forming a hook. Thus the whole head appears like a rounded, rough, prickly bur.

Fig. 2a. One of the hooked scales.

It is especially on account of the hooks that it is so obnoxious, as they adhere to clothing, hair of cattle or wool of sheep. Often in removing them many of the hooks pull loose from the plant and still adhere to the clothing, continuing their irritation.

Besides this the weed is coarse and unsightly, and will overshadow and crowd out any desirable vegetation. The
leaves are sometimes applied as a remedy for headache. The root is used in medicine.

Burdock is not a difficult weed to exterminate, and its presence in waste places or barnyards indicates careless neglect.

It may be easily exterminated. It is propagated by seed, and seeding may be easily prevented. The root lives only two years; therefore, if it is not allowed to seed, it will soon die out. It will not flourish even the second year if it is kept cut down the first. It is apt to be neglected the first year because it produces only leaves. These are small at first, so that it does not look formidable. At that time it is easily destroyed. In any case cut deep enough to remove all of the portion which bears the leaves at the surface of the ground and part of the root itself.

Wild Teasel (Dipsacus Sylvestris, Mill).

Some have thought that the name Teasel in the weed law was intended for Cocklebur, (Xanthium strumarium), and it was doubted whether the true Teasel occurs as a weed in Wisconsin; but reliable observers report that it does. The misunderstanding has made considerable confusion. The name can never be rightly applied to Cocklebur.

The Teasel may be recognized by the following characters: It is a coarse and stout herb, a biennial, growing from the seed the first year without flowers, the root living over winter, producing flowers and seeds the second year, after which it dies. The plant is prickly throughout on stems and leaves. Few of our herbaceous plants have prickly stems. The leaves are oblong, lance-shaped, much longer than broad and tapering but slightly upward and without leaf stalks. They are opposite, in pairs, on the stem and the bases are often united around it.

The flowers are small, pale purple, many collected together in a dense egg-shaped cluster or head similar in structure to the heads in the Composite family, to which the Teasel family is related. Within the cluster by the side of each small flower, is a scale which tapers into a slender point projecting beyond
the flower, so that the head is bristly all over. At the base of the head, outside, is a circle of stiff leaves forming an involucre, projecting and curved upward. They are of unequal length and prickly like the stem.

Fig. 3. Wild Teasel (Dipsacus sylvestris).

This plant has been reported in several localities and in some it has been exterminated. There is no reason to believe that it is common, but the reverse. Where introduced it is likely to become troublesome and should be killed out at once. This is not difficult. It is a native of Europe and is here only as an intruder.

Common Cocklebur (Xanthium strumarium, L).

It has been thought by some that the name Teasel in the weed law meant this plant, but this is probably an error, since the true Teasel occurs as a weed in the State and Cocklebur can never be rightly called Teasel.
Cocklebur is a very common weed, while Teasel is rare; the former is rank and troublesome and well deserves to be outlawed. Its fruit is very troublesome also, being covered with hooked prickles.

It is believed by Dr. Gray to exist in this country both native and naturalized from Europe. It is the introduced stock that grows in cultivated fields, barnyards and roadsides and is troublesome as a weed. The native plant grows along river banks. The root lives but one year, the growth is rank, the stem coarse, branching irregularly, one to three feet high, and sometimes reported even higher. The leaves are broadly triangular in general outline, more or less toothed and lobed, borne or long leaf-stalks.

![Diagram of Cocklebur](image)

**Fig. 4.** Cocklebur (*Xanthium strumarium*). Showing staminate flowers above, pistillate below: *a*, staminate flower enlarged; *b*, head of pistillate flowers showing bur-like covering with hooked prickles and at top protruding styles; *c*, same, older; *d*, same, cut through lengthwise, showing the two achenes, each of which contains one seed.

There are two kinds of flowers in separate heads or clusters on the same plant, one having stamens, the other having pistils and producing seeds. The staminate or sterile flowers are in clusters near the top of the stem, the pistillate or fertile, with their seeds, below them. As already explained, plants
of this family (Composite) have a row of scales around the head of flowers. In the fertile heads of this plant the scales take a peculiar form and become an egg-shaped bur, brown at maturity, covered with strong hooked prickles, and bearing two strong beaks at the upper end. This makes it very troublesome to sheep and to man also, because it adheres to the fleece or clothing.

Each bur encloses two flowers and at maturity, two seeds. It has been believed by farmers that one of the seeds may germinate the first year and the other lie dormant till a later time. Scientific investigation proves this to be true. Careful cultures of the seeds have been made at the University of Illinois, by Mr. G. W. McCluer, under the direction of Prof. T. J. Burrill. It was found that if a bur lies on the ground in such a position that one seed is up and the other down, the seed next to the soil may germinate and grow while the other lies dormant. This makes the plant somewhat difficult to deal with, for when apparently killed out, it may spring up again from these dormant seeds. But as the roots live only one year, it cannot withstand clean culture very long. It should never be allowed to seed.

This weed has been found by Baron F. von Mueller, of Australia, to be poisonous to cattle in that country. In the United States it is sometimes eaten sparingly by cattle with no serious results. Why it should be poisonous in one country and not in another is an unanswered question.

There are several parasitic fungi which grow upon the Cocklebur and draw their nourishment from its substance, thus helping to destroy it. These must be classed as beneficial fungi. Here are two of them. One appears in midsummer or later, as large brown blotches on the under surface of the leaves, and sometimes is so plentiful as to greatly reduce the plant’s vitality. It is a “rust” known as Puccinia Xanthii, having the same general character as wheat rust; but it is a distinct kind. The brown blotches are entirely made up of spores, of which there are many thousands. The other parasite is a fungus which grows on the outside of the leaf instead of working in the interior as the rusts do. This may be called the Cocklebur Mildew. It grows
over the leaf surface in the fall, giving the leaf a whitish or milky appearance. At length the spores develop, not bursting out from the interior of the leaf as the rust does, but forming in scattered brownish specks, just large enough to be seen among the white. Under the microscope they appear as balls, and contain spores. So fungi help us by preying upon weeds just as certainly as they injure our fruits and grains.

**Ox-eye Daisy, White Daisy, White-weed (Leucanthemum vulgare, Lam.)**

The Ox-eye Daisy lives from year to year in the ground and spreads by means of short, creeping underground stems or root-stocks, penetrating a few inches in depth. The stems grow from one to two feet high and branch but little. When there are branches they come from near the base.

![Fig. 5. Ox-Eye Daisy (Leucanthemum vulgare).](image)

The root-leaves are spatulate, broadest near the apex, and have rather long leaf-stalks. Those on the stem have no leaf stalks. All are coarsely toothed or cut. There
are scarcely any leaves on the upper part of the stem. At the end of the stem is one head of flowers, appearing like a single flower, and often called so, but really being composed of many small flowers, as already explained.

Those forming the row around the margin are white and each is spread out flat, so that it appears like only one petal of a flower; but it represents an entire flower. These are called the ray flowers. Each has its pistil (but no stamens) and produces one seed.

The central portion consists of many yellow, tube-shaped flowers, each of which has its stamens and pistil and produces a single seed.

The Ox-eye Daisy is very plentiful in the Eastern States. Grass lands are over-run with it so that at a distance they frequently appear as large white patches when it is in bloom. It is not a native plant but is introduced from Europe. In the Western States it has not yet become very troublesome, but is spreading every year. It was found in Wisconsin by the late Dr. I. A. Lapham of Milwaukee as early as 1850.

It is to be regretted that a plant so highly and so justly esteemed for the beauty of its flowers should become such a pest. It is a near relative of the cultivated kinds of *Chrysanthemum* and is scarcely exceeded in beauty by any of them. It is well worthy of cultivation for its flowers, if it can be kept from spreading too widely. It should not be allowed to mature its seeds.

To exterminate the Ox-eye Daisy from grass lands where it has got a hold is no small task, especially if it is generally diffused, unless there is a united effort on the part of all. A farmer finds little encouragement to clean it out from his own farm if he knows hundreds or thousands of seeds will be blown from his neighbor's farm or the roadside after a few weeks. It should never be allowed to seed; but keeping down the stems will not prevent the growth of the radical leaves, and so the roots and rootstocks will be nourished and live on indefinitely. To kill it out in grass lands is very difficult or impossible. Annual plowing or regular cultivation for some crop for several years is recom-
mended and ought to be effective; but, unless the roadsides and fence corners are closely watched, all efforts will be thwarted by repeated seeding.

**TOAD-FLAX. BUTTER-AND-EGGS. (Linaria vulgaris, Mill.)**

This is the plant which is believed to be meant by the name of Snapdragon in the weed law, but that name belongs to a very distinct plant, *Antirrhinum majus*, L. Toad-Flax is called Snapdragon by some in this State but wrongly. It is said to have been introduced into this State as a garden flower, and it is not without beauty; but in becoming a weed it has fallen from popular esteem. It is frequently found in

![Toad-Flax Illustration](image)

Fig. 6. Toad-Flax (*Linaria vulgaris*).

neglected yards, or escaped to the roadside, where it has taken a strong hold of the soil. Like most of our weeds, this is an introduced plant, an importation from Europe. It
spreads widely by means of its running roots and is quite difficult to kill out.

The stem grows from one to (rarely) three feet high, and bears numerous narrow leaves like those of Flax, scattered along the stem without any apparent order. From this fact it takes the name of Toad-Flax. The flowers are produced in a rather dense cluster on the upper portion of the stem. They are yellow and two-lipped, with the lips pressed close together. At the base of each flower is a slender protrusion called the spur. This will always distinguish it from the Snapdragon, which has no spur but only a slight rounded swelling or bulging out of the tube of the flower in its place. The pods, when mature, open near the top by one or two small holes, which allow the seeds to escape. If a pod is examined, it will easily be seen to have a partition across the middle dividing it into two cavities, both of which are filled with many small seeds.

**Snapdragon (Antirrhinum majus, L.)**

The true Snapdragon is closely related to Toad-Flax (Linaria), but still is a very distinct plant, and is not known to grow wild at all in Wisconsin, nor to be a weed in any sense.

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In no part of the United States has it more than sparingly escaped from gardens. It differs from Toad-Flax in its broader leaves and larger purple or white flowers, which have no spur at the base but only project slightly in a
rounded form at the place where the spur would be if developed. It is highly esteemed as a garden flower.

**Couch-, Quitch- or Quack-Grass (Triticum repens, L.)**

Couch-grass is a troublesome weed, not on account of its poor qualities as a grass, but of its aggressiveness. As an agricultural grass its qualities are excellent. In some parts of the country it is highly esteemed for cultivation and rightly. It compares well with Timothy in nutritive qualities, containing 9.94 per cent. of albuminoids, while Timothy contains only 8.3 per cent. It makes a good meadow.

But for the northern states its bad qualities overbalance its good ones. It produces long, slender underground stems which interweave, forming a strong sod. They send out rootlets at various points. These stems have joints like any common stem and from the joints branches are sent up which bear leaves and seeds. Usually branches do not come from every joint, but if the stems are broken or cut in pieces, as with a plow, hoe or harrow, each piece sends up a stem and leaves from any joint it may have and becomes a distinct plant. A large amount of nourishment is stored up in the form of starch, which makes the underground stems very nutritive and furnishes food for growth. The new plants formed by cutting up the old ones grow with great vigor and the result is many weeds in the place of one. When the subterranean portions are accessible to stock, they eat them readily. Horses and cows are fond of them and may get much nourishment from their rich stores. Hogs root industriously for them and give efficient help in extermination.

The mode of growth of this weed makes it very difficult to exterminate—quite like Canada Thistle. A summer fallow is highly recommended by those who have tried it. Turn the sod under in June and harrow whenever the grass appears above ground. Or sow with corn for fodder. This will help to keep down the grass. When once killed, it makes a rich manure as the Canada Thistle does.

In the structure of the "head" or fruiting portion, Conch-
grass is similar to wheat but smaller and the two are classed together by botanists.

One of the most valuable agricultural grasses in Montana is a close relative of Conch-grass and similar in its mode of growth. When a sod begins to be exhausted, it is renewed by harrowing. This breaks the underground stems into many pieces; each piece becomes an independent plant and grows vigorously.

**Beggar's Lice (Cynoglossum Morisoni, DC.)**

During the late summer and fall the woods are full of plants of various species, whose fruit is provided with hooks, barbs, or some means of attachment to clothing or the hair of animals, which serves to disseminate the seeds. The worst of these is that named above. It grows two to four feet high and has long slender branches covered with the prickly seed vessels. The latter are covered with barbed points by which they adhere so tightly to clothing that they can scarcely be removed entire. It is a great pest and ought to be exterminated.

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