A FIELD GUIDE TO BROADLEAF WEEDS

Presented by the Ontario Ministry of Agriculture, Food and Rural Affairs, University of Guelph, and Bayer CropScience
Cover images

**Velvetleaf**
*Abutilon theophrasti* (L.)
flower
page 38

**Field violet**
*Viola arvensis* (L.)
flower
page 18

**Hairy nightshade**
*Solanum sarachoides* (L.)
flower
page 26

**Flower of an hour**
*Hibiscus trionum* (L.)
flower
page 20

**Field violet**
*Viola arvensis* (L.)
seed pod
page 18
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Successful weed identification requires two things – the ability to pay attention to detail, and repetition. People often look at a weed, go to an identification book and flip through the pages hoping to find a match. This often fails. If you document all distinguishing features that are identified in the figures (at right) you will have a higher probability of finding a correct match. Still stumped? Visit weedinfo.ca or mauvaisesherbes.ca and go to the weed identification services link. There you can submit a photo and provide any distinguishing features. A response will be emailed to you and posted on the blog page.

This field guide provides all the necessary information to correctly identify 21 of the most common broadleaf weeds found in corn, soybean and cereal crops.

The information on each weed includes:

• key agronomic info including geographic ranges and competiveness
• close-up photos to clearly identify various plant parts
• important decision-making tools including potential herbicide resistance
Contributors

Mike Cowbrough
Provincial Weed Specialist
OMAFRA – Technical Information and Photography

Peter Smith
Field Technician
Department of Plant Agriculture
University of Guelph – Photography

Special acknowledgement

Jack Alex
Jack Alex, Professor Emeritus, University of Guelph

For more than 50 years Jack has worked tirelessly at teaching Ontarians how to identify weeds. His contributions to Ontario agriculture have been invaluable.
Technical review

Bruce Murray
Provincial Weed Specialist, Manitoba

Darren Robinson
University of Guelph – Ridgetown Campus

Peter Sikkema
University of Guelph – Ridgetown Campus

Clarence Swanton
Department of Plant Agriculture
University of Guelph

François Tardif
Department of Plant Agriculture
University of Guelph

Rene Van Acker
Department of Plant Agriculture
University of Guelph

Annalee Winter
University of Guelph
**Black medick**  
*Medicago lupulina (L.)*

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual, biennial or short-lived perennial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Seedlings emerge in early spring</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Limited field trials indicate 15-20% yield losses in corn due to moderate to heavy populations of black medick</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. Medicago species are generally more tolerant to glyphosate than other annual and biennial weed species.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- elongated cotyledons, followed by a long petiole and a round unifoliate leaf and pointed apex

**young seedling leaves**
- alternate and compound with 3 round leaflets
- last third of leaf serrated

**flowers**
- small dense head-like and yellow clusters

**seed pods**
- green then turning black
- coiled and prominently ridged
### Canada fleabane
*Conyza canadensis* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual, winter annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>The majority of seedlings will emerge in early spring, but will also emerge in the fall and overwinter</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Moist fertile soils of varying texture, more common on loam and clay soils</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Very competitive especially at high densities</td>
</tr>
<tr>
<td>Resistance</td>
<td>Populations resistant to glyphosate (Group 9), Group 2 (i.e. Classic®) and Group 22 (i.e. Gramoxone®) herbicides exist in the United States. There are no documented cases of glyphosate or Group 2 resistant fleabane in Eastern Canada to date.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- round-oval

**young leaves**
- hairy, round with entire margins, but then turning oval with margins having 2-3 notches and a rounded apex

**older leaves**
- hairy, elongated with margins having 2-3 notches with a tapering apex

**flowers**
- very short white ray florets
- yellow disk florets
- fluffy at maturity
# Common mallow

*Malva neglecta* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual, biennial or short-term perennial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Germinates very early in the spring</td>
</tr>
<tr>
<td>Range</td>
<td>Prominent throughout Eastern Canada mainlly on field borders and headlands, but increasing in minimum-till cropping systems</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Very competitive, especially at high densities</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. Members of the mallow family tend to be more tolerant to glyphosate compared to other annual species.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- spade shaped

**seedling plants**

**leaves**
- kidney-shaped leaves on a long stalk with shallow toothed margins

**flowers**
- 5 white to pinkish white petals
# Common ragweed

*Ambrosia artemisiifolia* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Germinates and emerges early in the spring</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Extremely competitive especially at high densities. In field crops yield losses can approach 90%.</td>
</tr>
<tr>
<td>Resistance</td>
<td>Populations resistant to glyphosate (Group 9) exist in the United States. Group 5 (i.e. atrazine) and Group 2 (i.e. Classic) resistant populations exist in Ontario.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- orbicular

**leaves**
- compound and finely divided

**stems**
- erect, much branched and hairy
- leaves have an opposite orientation on the stem (as shown) but become alternate higher up on the plant

**flowering heads**
- unisexual with pollen producing flower heads (as shown) and seed producing flower heads
**Eastern black nightshade**
*Solanum ptychanthum* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Will emerge early in the spring, but are also able to germinate late in the spring and into the summer and can easily thrive in low light environments</td>
</tr>
<tr>
<td>Range</td>
<td>Throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Is most commonly found on loam and clay loam soils, but will exist in all soil types</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Competitive, but will negatively impact crop quality through staining</td>
</tr>
<tr>
<td>Resistance</td>
<td>A number of populations are resistant to Group 2 (i.e. Pursuit®) herbicides in Ontario and throughout North America. No documented cases of glyphosate resistance in Eastern Canada. However, due to the limited residual activity of glyphosate combined with this weed's emergence pattern, it is common to see eastern black nightshade in glyphosate tolerant cropping systems.</td>
</tr>
</tbody>
</table>

**Often mistaken for: redroot pigweed, green pigweed**

**I know it’s NOT because…**
*The leaf margins of eastern black nightshade are hairy compared to the hairless and entire margins of redroot and green pigweed. In addition, the margins of older leaves on eastern black nightshade are wavy toothed.*

**Often mistaken for: hairy nightshade**

**I know it’s NOT because…**
*The leaf surface and stems of eastern black nightshade are hairless and the berries upon maturity are black, as opposed to the mature brown berries of hairy nightshade.*
Identification clues:

**cotyledons**
- oblong with hairy margins
- first leaves oval, the underside usually being purple

**leaves**
- younger leaves oblong with hairy margins
- older leaves lacking the hairy margins, but margins become wavy toothed and the purple underside may begin to diminish in flamboyance

**flowers**
- often 2-5 flowers grouped together in a small umbel
- the petals are white and unite into a star shaped corolla with 5 sharp lobes
- the tubular floret is yellow

**berries**
- green then turning black
- the calyx of 5 united green sepals that were behind the white star shaped corolla will enclose the berries once they are formed

**whole plant**
# Field horsetail

*Equisetum arvense* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Perennial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Mainly by rhizomes, but may reproduce by spores in early spring</td>
</tr>
<tr>
<td>Emergence</td>
<td>Will emerge in early spring as shoots with spore-producing tips and then later the shoots emerge as a pine tree-like structure</td>
</tr>
<tr>
<td>Range</td>
<td>Prominent throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>More typically found in poorly drained soils, but can certainly grow in sandy soils</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Considered an extremely competitive species</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada. Field horsetail is more tolerant of glyphosate as compared to other perennial weeds.</td>
</tr>
</tbody>
</table>
Identification clues:

**rhizomes**
- dark brown or blackish and will often go as deep as 1 m

**shoots**
- green, slender, erect and hollow

**leaves**
- leafless, but with whorls of 6-8 branches at nearly every black node
Field violet
*Viola arvensis* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual, winter annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>The majority of seedlings will emerge in the fall and early spring</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Most prominent in cereal crops and in sandy and loam soils</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Research in the United Kingdom has shown that field violet is one of the least competitive species in cereal crops and does not cause any appreciable yield loss</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- round to ovate

**leaves**
- lower leaves round
- upper leaves elongated with round toothed margins with short sparse hairs

**flowers**
- resembling those of cultivated pansy but much smaller

**seed pods**
- seedpods will split into 3 divisions scattering numerous, small, brownish seeds
# Flower of an Hour

*Hibiscus trionum* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Requires warmer soil temperatures to germinate, therefore typically emerges in late spring to early summer. Germinates poorly when close to the soil surface.</td>
</tr>
<tr>
<td>Range</td>
<td>Most typically found in southwestern Ontario</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Very competitive, especially at high densities</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. Members of the mallow family tend to be more tolerant to glyphosate compared to other annual species.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- orbicular

**young leaves**
- first leaf orbicular with a somewhat entire margin,
- second leaf orbicular but with toothed margins

**stems**
- erect at first, then branched and spreading with coarse whisker-like hairs along with a more fuzzy pubescence

**mature leaves**
- blades are oriented alternately on the stem, are 3-parted with each division being coarsely lobed

**flowers**
- light yellow petals with a purplish centre and within a coarsely hairy calyx having prominent purplish veins with a linear ring of hairy bracts below the calyx
### Giant ragweed

**Ambrosia trifida (L.)**

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual, winter annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>The majority of seedlings emerge in early spring to early summer</td>
</tr>
<tr>
<td>Range</td>
<td>Typically found in the southern and central regions of Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Extremely competitive especially at high densities. In field crops yield losses can approach 90%.</td>
</tr>
<tr>
<td>Resistance</td>
<td>Populations resistant to glyphosate (Group 9) and Group 2 (i.e. Classic) herbicides exist in the United States. No documented cases of herbicide resistance in Eastern Canada to date.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- oblong

**leaves**
- large and rough to the touch (sandpaper-like)
- round with 3-5 lobes
- coarsely toothed margins

**stems**
- opposite orientation, much branched and very hairy

**flowering heads**
- unisexual with pollen producing flower heads (as shown) and seed producing flower heads
Green pigweed
Amaranthus powelli (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Will emerge in the spring, typically after lamb’s-quarters</td>
</tr>
<tr>
<td>Range</td>
<td>Throughout Eastern Canada. Contrary to popular belief, green pigweed is more common in Ontario than redroot pigweed.</td>
</tr>
<tr>
<td>Habitat</td>
<td>Exists in all types of soils, can withstand a range of soil pHs and is most prominent in soils rich in phosphorus and potassium</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Extremely competitive</td>
</tr>
<tr>
<td>Resistance</td>
<td>A number of populations are resistant to Group 2 (i.e. Pursuit), Group 5 (i.e. atrazine) and Group 7 (i.e. linuron) herbicides in Ontario and throughout North America. There are no known cases of glyphosate resistant populations in North America.</td>
</tr>
</tbody>
</table>

Often mistaken for: redroot pigweed

I know it’s NOT because...
The stem of redroot pigweed is covered in dense short hairs, whereas only the upper nodes on the stem of green pigweed have hairs. The first leaves are tapered and shiny green compared to the rounded and dull green leaves of redroot pigweed.

Often mistaken for: waterhemp

I know it’s NOT because...
The upper stem node of green pigweed has a cluster of dense hairs whereas the stem of waterhemp is smooth and hairless (with the possible exception of some sparse short whiskers on the top node). Waterhemp will typically have narrower leaves with wavy margins and no notched apex.

Often mistaken for: eastern black nightshade

I know it’s NOT because...
The leaf margin of young eastern black nightshade leaves are hairy and the older leaves have wavy toothed margins.
Identification clues:

**stems**
- sparse short hair primarily near the top node, alternate leaf orientation

**leaves**
- early leaves, tapered, older leaves round, shiny green (see also stems figure) and with a notched apex

**whole plant**
- young seedling plant

**seed heads**
- the individual bristly finger-like spikes are longer than that of red root pigweed
- produces seed that is indistinguishable from other pigweed species
**Hairy nightshade**  
*Solanum sarachoides* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Emerges early in the spring and generally at the same time as lamb’s-quarters</td>
</tr>
<tr>
<td>Range</td>
<td>Throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Is most commonly found on sandy and muck soils and more frequently in horticultural crops</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Competitive, particularly at high densities</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada exist to date</td>
</tr>
</tbody>
</table>

**Often mistaken for: eastern black nightshade**

*I know it’s NOT because…*

*The stem and leaves of hairy nightshade are covered in dense hairs. The berries upon maturity are brown, as opposed to the black berries of eastern black nightshade.*
Identification clues:

**cotyledons**
- oblong with hairy margins

**stems**
- extremely hairy

**leaves**
- alternate orientation on the stem, extremely hairy
- ovate to almost triangular
- note the hairy petiole

**flowers**
- often 3–9 flowers in a short raceme
- the corolla is white, but sometimes with a bluish purple undertone
- the tubular floret is yellow

**whole plant**
Lamb's-quarters
Chenopodium album (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Emerges very early in the spring</td>
</tr>
<tr>
<td>Range</td>
<td>One of the most prominent species in Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Found on all soil types and mainly in agricultural fields</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>One of the most competitive species in field crops that causes significant yield losses if uncontrolled</td>
</tr>
<tr>
<td>Resistance</td>
<td>Group 2 (e.g. Pinnacle®) and triazine resistant populations exist in Eastern Canada. Populations resistant to glyphosate have been confirmed in Ohio, U.S. There have been significant performance issues in Eastern Canada causing speculation of elevated tolerance to glyphosate.</td>
</tr>
</tbody>
</table>

**Often mistaken for: spreading atriplex**

*I know it's NOT because…*

*The leaves of lamb’s-quarters are more broad and triangular with shallow toothed margins. Spreading atriplex has lanced shaped leaves with 1 or 2 distinct lobes at the base, the margins are entire and the stems are prostrate and wirey.*
Identification clues:

**cotyledons**
- linear

**leaves**
- broad, triangular shaped, toothed margins, mealy surface
- first leaves of opposite orientation, but later ones are distinctly alternate

**stems**
- erect, young stem green, mature stem green with sometimes reddish or purplish lengthwise strips or ridges

**flowers**
- small, green, densely grouped granular clusters then turning brown with small, round but somewhat flattened grayish black seed within
**Prostrate knotweed**  
*Polygonum aviculare (L.)*

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual, winter annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Majority of seed germinates and emerges in the spring</td>
</tr>
<tr>
<td>Range</td>
<td>Prominent throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil, but most prominent in heavy soils and compacted soils</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Less competitive than other annual species</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. Members of the smartweed family tend to be more tolerant to glyphosate compared to other annual species.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- linear

**stems**
- prostrate, thin, wirey

**leaves**
- length typically 3 times its width, but may be broader when competing with field crops, alternate orientation on the stem

**ocrea**
- a skin-like membraneous sheath that wraps around the stem at each node

**flowers**
- very small, almost unnoticeable with white to pinkish white sepals
# Redroot pigweed

*Amaranthus retroflexus* (L.)

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Will emerge in the spring, typically after lamb’s-quarters</td>
</tr>
<tr>
<td>Range</td>
<td>Throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Exists in all types of soils, can withstand a range of soil pHs and is most prominent in soils rich in phosphorus and potassium</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Extremely competitive</td>
</tr>
<tr>
<td>Resistance</td>
<td>A number of populations are resistant to Group 2 (i.e. Pursuit), Group 5 (i.e. atrazine), Group 6 (i.e. Pardner®) and Group 7 (i.e. linuron) herbicides in Ontario and throughout North America. There are no known cases of glyphosate resistant populations in North America.</td>
</tr>
</tbody>
</table>

**Often mistaken for: green pigweed**

I know it’s NOT because…

*The stem of redroot pigweed is covered in dense short hairs, whereas only the upper nodes on the stem of green pigweed have hairs. The first leaves are rounded and dull green compared to the tapered and shiny green leaves of green pigweed.*

**Often mistaken for: waterhemp**

I know it’s NOT because…

*The stem of redroot pigweed is covered in dense short hairs. The stem of waterhemp is smooth and hairless.*

**Often mistaken for: eastern black nightshade**

I know it’s NOT because…

*The leaf margin of young eastern black nightshade leaves are hairy and the older leaves have wavy toothed margins.*
Identification clues:

- **stems**
  - short dense hairs, alternate leaf orientation

- **leaves**
  - round, dull green with a notched apex

- **whole plant**
  - young seedling plant

- **seed heads**
  - a number of short, thick and bristly spikes producing many small black seeds
Spreading atriplex  
*Atriplex patula* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Emerges very early in the spring and typically grows quite quickly</td>
</tr>
<tr>
<td>Range</td>
<td>Throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Will exist in all soil types but most typically found on heavier textured soils</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>A very competitive species that will cause significant yield reductions if left uncontrolled</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. However, spreading <em>atriplex</em> is more tolerant to glyphosate when compared to other annual species. This is more noticeable in larger plants, which are common early on in the spring due to this species’ early emergence and quick growth.</td>
</tr>
</tbody>
</table>

**Often mistaken for: lamb’s-quarters**

*I know it’s NOT because…*

*Spreading atriplex* has lanced shaped leaves with 1 or 2 distinct lobes at the base, the margins are entire and the stems are prostrate and wirey. The leaves of lamb’s-quarters are more broad and triangular with shallow toothed margins.
Identification clues:

cotyledons
- linear

leaves
- lance shaped with one or two distinctive lobes at the base
- usually has very few if any teeth along the leaf margin

seedlings
- key distinction from lamb’s-quarters: the lobes at the base of the leaf

stems
- prostrate to nearly erect, the younger leaves are opposite in orientation off the main stem, but eventually becoming alternate

unisexual flowers
- the female flower shown is enclosed between triangular bracts and in clusters of 2-5 within the axils of smaller leaves
Tufted vetch
Viccia cracca (L.)

Lifestyle | Perennial
--- | ---
Propagation | Reproduces by seed and spreading underground roots
Emergence | Tends to emerge later in the spring
Range | Found throughout Eastern Canada
Habitat | Establishes in all types of soil
Competitiveness | A very patchy species in terms of field distribution. Where established can cause significant yield losses and reduces harvesting efficiency.
Resistance | No documented cases of herbicide resistance in Eastern Canada to date. However this species is tolerant to typical field rates of glyphosate.
Identification clues:

**Stems**
- long and wiry

**Leaves**
- alternate and pinnately compound with 8-12 pairs of hairy leaflets and a tendril at the end which allows the plant to climb up objects

**Flowers**
- purple to bluish-purple resembling the flower head of a pea

**Seed Pod**
- green then turning black
- coiled and prominently ridged
# Velvetleaf

*Abutilon theophrasti* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Germinates and emerges over a long period of time during the spring and early summer</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil but most prominently on nutrient rich soils</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Very competitive, especially at high densities</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. Members of the mallow family tend to be more tolerant to glyphosate compared to other annual species.</td>
</tr>
</tbody>
</table>
Identification clues:

**cotyledons**
- orbicular

**leaves**
- broad and heart-shaped with a sharp pointed apex, velvety touch and alternate orientation on the stem, margins are shallowly round-toothed

**flowers**
- containing 5 yellow petals and 5 green sepals

**fruit**
- circular cluster of 12-15 seedpods which are green at first then turning black
# Waterhemp

*Amaranthus rudis* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Both male and female plants exist with only the female plants producing seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Will emerge in the spring, typically after lamb's-quarters</td>
</tr>
<tr>
<td>Range</td>
<td>This species has only been documented in the southern part of Ontario. It has migrated slowly north from the southern and midwest United States.</td>
</tr>
<tr>
<td>Habitat</td>
<td>Exists in all types of soils, can withstand a range of soil pHs and is most prominent in soils rich in phosphorus and potassium</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Extremely competitive</td>
</tr>
<tr>
<td>Resistance</td>
<td>A number of populations are resistant to Group 2 (i.e. Pursuit) and Group 5 (i.e. atrazine) herbicides in Ontario and throughout North America. Waterhemp populations resistant to glyphosate have been documented in the United States.</td>
</tr>
</tbody>
</table>

**Often mistaken for: redroot pigweed**

*I know it’s NOT because...*

*The stem of redroot pigweed is covered in dense short hairs, whereas waterhemp is smooth and hairless. The waterhemp leaf lacks a notched leaf apex.*

**Often mistaken for: green pigweed**

*I know it's NOT because...*

*The upper stem node of green pigweed has a cluster of dense hairs whereas the stem of waterhemp is smooth and hairless. Waterhemp will typically have narrower leaves with wavy margins and without a notched apex.*

**Often mistaken for: eastern black nightshade**

*I know it’s NOT because...*

*The leaf margin of young eastern black nightshade leaves are hairy and the older leaves have wavy toothed margins.*
Identification clues:

**stems**
- alternate leaf orientation, smooth with no hairs, variable colouring

**leaves**
- tapered, typically leaves will have a wavy margin and lack a notched apex

**whole plant**
- young seedling plant

**seed heads**
- long narrow spikes with only the female plants producing seed (male sterile flowering head shown)
### White cockle
*Silene alba (L.)*

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Biennial or short-term perennial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>New seedlings will emerge predominate in the spring, but can emerge in the fall</td>
</tr>
<tr>
<td>Range</td>
<td>Prominent throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>More typically found in forage crops, and on heavier soils but increasingly becoming a problem in minimum-till corn and soybean fields</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Very competitive as this species grows quickly in the spring and will flower and set seed throughout the summer</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date</td>
</tr>
</tbody>
</table>

**Often mistaken for: bladder campion**

**I know it’s NOT because...**

*White cockle is extremely hairy and bladder campion is smooth and hairless, the calyx is also smooth and bladder shaped.*

**Often mistaken for: night-flowering catchfly**

**I know it’s NOT because...**

*Night-flowering catchfly is extremely sticky to touch especially the stem and calyx, white cockle is not sticky at all.*
Identification clues:

**seedlings**
- first few leaves appear as a rosette

**flowers**
- white with 5 deeply lobed petals

**leaves**
- softly hairy on both sides, lance shaped and tapering to a point, margins are hairy, entire and wavy

**male calyx**
- tubular, with 10 distinctive purplish lengthwise veins, the female (seed producing) calyx with 5 prominent veins and usually 3 much fainter veins in between
**Wild buckwheat**
*Polygonum convolvulus* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Majority of seed germinates and emerges in the spring but will germinate throughout the summer and early fall</td>
</tr>
<tr>
<td>Range</td>
<td>Prominent throughout Eastern Canada</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Less competitive than other annual species, but can reduce harvesting ease in cereal crops due to its climbing nature</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. Members of the smartweed family tend to be more tolerant to glyphosate compared to other annual species.</td>
</tr>
</tbody>
</table>

**Often mistaken for: field bindweed**

*I know it’s NOT because…*

*The presence of an ocrea, very small flowers and a less robust root system.*
Identification clues:

**cotyledons**
- elongated

**leaves**
- arrowhead shape

**ocrea**
- a skin-like membranous sheath that wraps around the stem at each node

**fruit**
- triangular shaped, green then turning black
- seeds are dull black

**flowers**
- very small with greenish to whitish petals
**Wild carrot**  
*Daucus carota (L.)*

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Biennial or short-term perennial, occasionally an annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propagation</td>
<td>Reproduces by seed</td>
</tr>
<tr>
<td>Emergence</td>
<td>Germinates early in the spring and sometimes in the fall</td>
</tr>
<tr>
<td>Range</td>
<td>Prominent throughout Eastern Canada mainly on field borders and headlands, but increasing in minimum-till cropping systems</td>
</tr>
<tr>
<td>Habitat</td>
<td>Establishes in all types of soil</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Very competitive, especially at high densities</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Eastern Canada to date. Field experience would suggest that there are populations more tolerant to glyphosate than others.</td>
</tr>
</tbody>
</table>

**HOT TIP:**  
Crush the leaf tissue with your fingers and you should smell a carrot-like odour. The taproot will also smell and taste like cultivated carrot.
Identification clues:

**cotyledons**
- narrow and linear

**flowers**
- white in a compound umbel (a large umbel made up of many small umbels) with a single purple flower in the centre

**leaves**
- compound leaf, young leaves with 3 main divisions, older leaves with more than 3 divisions

**fruit**
- brownish with several rows of spines which cling to objects
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A FIELD GUIDE TO

GRASSY WEEDS

Presented by the
Ontario Ministry of
Agriculture, Food and Rural Affairs,
University of Guelph,
and Bayer CropScience
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How to use this guide

Grassy weeds are generally harder to identify in the field than broadleaf weeds, and are also highly selective when it comes to herbicide sensitivity. Correctly identifying grassy weed species is critical to designing an effective weed control program.

This field guide provides all the necessary information to correctly identify 11 of the most common grassy weeds found in corn, soybean, canola and cereal crops.

The information on each weed includes:
- key agronomic info including estimates of crop yield losses
- close-up photos to clearly identify various plant parts
- clues to help distinguish from similar weed species
Contributors

Special thanks to Mike Cowbrough and Peter Smith for providing the agronomic information and photography for this field guide.

Mike Cowbrough

Mike is the Weed Specialist for Field Crops with the Ontario Ministry of Agriculture, Food and Rural Affairs. Although a relatively young lad, Mike has been involved in weed management research and extension for more than a decade. A University of Guelph graduate with a Master’s degree in Weed Science, Mike is responsible for editing OMAFRA Publication 75 – Guide to Weed Control, the Problem Weed Control in Field Crops database and the Herbicide Resistant Weeds in Ontario website. Mike lives on the family farm in Guelph with his wife Shannon.

Peter Smith

Peter is a Field Technician in Weed Science in the Department of Plant Agriculture, University of Guelph, working with Dr. François Tardif since 1996. Peter focuses his time on herbicide resistance as well as current issues in weed research and product development. After graduating from the University of Guelph in 1988 with an honours degree in biology, Peter became a technician in the Pastures and Forage Management Program. Further experience as both a summer student and full time in corn physiology and cropping systems – as well as eight years as a weeds technician – have given Peter an excellent, well rounded look into many areas of agricultural research. Peter comes from a large family centred in the Guelph area, where he and his wife, Janette Hogan, raise their three children.
Barnyard grass  
*Echinocloa crusgalli* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>A very common annual grass in field crops found on a number of different soil types</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout the province</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
<tr>
<td>Competitiveness</td>
<td></td>
</tr>
</tbody>
</table>
  - Corn: 2% & 7% yield loss at 1 & 5 barnyard grass/m² respectively  
  - Soybean: 3% & 12% yield loss at 1 & 5 barnyard grass/m² respectively |
| Emergence   | Considered an early- to mid-season emerging annual grass |

**Often mistaken for:**  
fall panicum  
yellow foxtail

<table>
<thead>
<tr>
<th>I know it’s NOT</th>
<th>because…</th>
</tr>
</thead>
<tbody>
<tr>
<td>fall panicum</td>
<td>barnyard grass has no ligule</td>
</tr>
<tr>
<td>yellow foxtail</td>
<td>barnyard grass has no ligule and no hairs on the leaf sheath margin</td>
</tr>
</tbody>
</table>
Identification clues:

**ligule**
- none, the only common annual grass without a ligule

**leaf blade**
- hairless on both sides of the leaf blade

**leaf sheath**
- flat and hairless
- leaf sheath margins are also hairless

**seed head**
- central axis with lateral branches containing dense clusters of spikelets
Fall panicum

Panicum dichotomiflorum

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>An annual grass species that, in general, is poorly controlled by soil-applied herbicides because of its late emergence pattern</td>
</tr>
<tr>
<td>Range</td>
<td>Most prominent in the southwest portion of the province</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
</tbody>
</table>
| Competitiveness | • Corn: 2% & 10% yield loss at 1 & 5 fall panicum/m² respectively  
• Soybean: 2% & 10% yield loss at 1 & 5 fall panicum/m² respectively |
| Emergence       | One of the last annual grass species to emerge in the spring |

**Often mistaken for:**
giant foxtail  
green foxtail  
proso millet  
smooth crabgrass

**I know it’s NOT**  
**because...**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>giant foxtail</td>
<td>all panicum does not have hairy leaf sheath margins and the upper leaf blade is hairless</td>
</tr>
<tr>
<td>green foxtail</td>
<td>fall panicum does not have hairy leaf sheath margins</td>
</tr>
<tr>
<td>proso millet</td>
<td>fall panicum does not have a hairy stem or hairs along the base of the leaf blade margin</td>
</tr>
<tr>
<td>smooth crabgrass</td>
<td>fall panicum has a hairy ligule</td>
</tr>
</tbody>
</table>
Identification clues:

**ligule**
- hairy

**leaf blade**
- young seedlings: lower leaf surface is densely hairy, but becomes less hairy with age
- older seedlings: smooth and hairless with a very prominent mid-rib

**leaf sheath**
- margins are hairless

**seed head**
- several branched panicles about 10-40 cm long
- seed is yellow to brown in colour
# Giant foxtail

*Setaria faberii* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview</strong></td>
<td>Generally more competitive, though not as common as its close relatives, green and yellow foxtail</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Most prominent in the southwest portion of the province</td>
</tr>
<tr>
<td><strong>Resistance</strong></td>
<td>Group 2 resistant population has been confirmed in Lambton county</td>
</tr>
<tr>
<td><strong>Competitiveness</strong></td>
<td></td>
</tr>
</tbody>
</table>
  - Corn: 2% & 10% yield loss at 1 & 5 giant foxtail/m² respectively  
  - Soybean: 3% & 12% yield loss at 1 & 5 giant foxtail/m² respectively |
| **Emergence** | One of the first annual grass species to emerge in the growing season |

**Often mistaken for:**
- fall panicum
- green foxtail

**I know it’s NOT** because...

| fall panicum | giant foxtail has a hairy upper leaf blade surface as well as hairy leaf sheath margins |
| green foxtail | giant foxtail has a hairy upper leaf blade surface |
Identification clues:

ligule • hairy

leaf blade • hairy upper leaf surface and hairless lower leaf surface

leaf sheath • hairy margins

seed head • 15-20 cm long • roughly twice the size of green foxtail’s seed head
# Green foxtail

*Setaria viridis* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>Perhaps the most common annual grassy weed species in Ontario</td>
</tr>
<tr>
<td>Range</td>
<td>Species found throughout the province</td>
</tr>
<tr>
<td>Resistance</td>
<td>Group 2 resistant populations have been confirmed in Huron, Lambton, Perth, Wellington and Victoria counties</td>
</tr>
</tbody>
</table>
| Competitiveness | • Corn: 2% & 7% yield loss at 1 & 5 green foxtail/m² respectively  
• Soybean: 2% & 8% yield loss at 1 & 5 green foxtail/m² respectively |
| Emergence | One of the first annual grass species to emerge in the growing season |

**Often mistaken for:**
fall panicum  
giant foxtail

**I know it’s NOT** because…

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>fall panicum</td>
<td>green foxtail has a hairy leaf margin, fall panicum does not</td>
</tr>
<tr>
<td>giant foxtail</td>
<td>the upper and lower leaf blade surface of green foxtail is hairless</td>
</tr>
</tbody>
</table>
Identification clues:

**ligule**
- hairy

**leaf blade**
- smooth upper and lower surface

**leaf sheath**
- hairy margins

**seed head**
- 4-10 cm long
- roughly half the size of giant foxtail’s seed head

**HOT TIP:** Still can’t see the hairy margins on the leaf sheath? Look at the point where the leaf sheath separates from the stem. The hairy margins are most visible at this location. A magnifying glass will help you see this botanical detail.
Large crabgrass

*Digitaria sanguinalis* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview</strong></td>
<td>A common annual grass that thrives in many different soil types. Soil-applied herbicides are generally most effective at controlling this weed. However, late emerging seedlings often escape herbicide applications.</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Found throughout the province</td>
</tr>
<tr>
<td><strong>Resistance</strong></td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
</tbody>
</table>
| **Competitiveness** | • Corn: 1% & 3% yield loss at 1 & 5 crabgrass/m² respectively  
• Soybean: 1% & 3% yield loss at 1 & 5 crabgrass/m² respectively |
| **Emergence** | Considered a mid- to late-season emerging annual grass |

**Often mistaken for:**
proso millet  
smooth crabgrass  
witchgrass

**I know it’s NOT**

<table>
<thead>
<tr>
<th><strong>proso millet</strong></th>
<th>because...</th>
</tr>
</thead>
<tbody>
<tr>
<td>large crabgrass has a membranous ligule, proso millet’s ligule is hairy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>smooth crabgrass</strong></th>
<th>because...</th>
</tr>
</thead>
<tbody>
<tr>
<td>large crabgrass has a hairy leaf sheath and both sides of the leaf blade are hairy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>witchgrass</strong></th>
<th>because...</th>
</tr>
</thead>
<tbody>
<tr>
<td>large crabgrass has a membranous ligule, witchgrass’s ligule is hairy</td>
<td></td>
</tr>
</tbody>
</table>
Identification clues:

- **ligule**
  - membranous

- **leaf blade**
  - hairy on both sides of the leaf blade

- **leaf sheath**
  - hairy, yet the margins are hairless

- **seed head**
  - finger-like with several thin and slender spikes
Proso millet
*Panicum milliaceum* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>A common annual grass found in many different soil types. One of the most competitive annual grass species.</td>
</tr>
<tr>
<td>Range</td>
<td>Throughout the province, but most prominent in south-central Ontario</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
</tbody>
</table>
| Competitiveness | • Corn: 2% & 10% yield loss at 1 & 5 proso millet/m² respectively  
• Soybean: 3% & 12% yield loss at 1 & 5 proso millet/m² respectively |
| Emergence | Emerges over a long-period of time but generally considered an early- to mid-season annual grass |

**Often mistaken for:**
large crabgrass  
witchgrass

**I know it’s NOT** because...

| Large crabgrass | Proso millet has a hairy ligule, large crabgrass has a membranous ligule |
| Witchgrass     | The leaf blade of proso millet is usually hairless and has prominent leaf veins running parallel to the leaf blade margins |
Identification clues:

**ligule**
- hairy

**leaf blade**
- usually hairless, but can have sparse hairs on upper and lower leaf surfaces

**leaf sheath**
- extremely hairy, leaf sheath margin is also hairy

**seed head**
- will have two different seed head types, a closed broom-like panicle or a more wide open panicle
- six different seed colours exist: white, yellow, green, orange, reddish brown, black

**HOT TIP:** Still unsure whether it's witchgrass or proso millet? Dig up a seedling. Proso millet will have a shiny seed (may be one of six different colours) attached to the end of the root.
Quackgrass
Agropyron repens (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Perennial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>The most common perennial grass species found in field crops</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout the province</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
</tbody>
</table>
| Competitiveness | • Corn: 4% & 15% yield loss at 1 & 5 quackgrass/m² respectively  
                 • Soybean: 4% & 18% yield loss at 1 & 5 quackgrass/m² respectively |
| Emergence | Will emerge at any point throughout the season, as long as it isn’t shaded by competing crops |

Often mistaken for:
wire-stemmed muhly

I know it’s NOT because...

wire-stemmed muhly
quackgrass has an auricle, plus wire-stemmed muhly has very wirey stems with short, thin leaves
Identification clues:

- **ligule**: membranous, but very short and hard to see
- **auricle**: present at the base of the leaf blade
- **leaf blade**: hairless on both sides of the leaf blade
- **leaf sheath**: hairless; leaf sheath margins are also hairless
- **rhizomes**: sharp-pointed and far-reaching in the soil
- **seed head**: elongated narrow spike (5-20 cm long) with spikelets in 2 rows
Smooth crabgrass  
*Digitaria ischaemum* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>Considered mainly a weed problem in turf, smooth crabgrass is not as common as large crabgrass in terms of distribution in agricultural fields. Nonetheless, it can be problematic due to its late emergence pattern.</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout the province</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
</tbody>
</table>

**Competitiveness**
- Corn: 1% & 3% yield loss at 1 & 5 crab grass/m² respectively
- Soybean: 1% & 3% yield loss at 1 & 5 crab grass/m² respectively

Emergence
- Considered a late-season emerging annual grass

**Often mistaken for:**
- fall panicum
- large crabgrass

<table>
<thead>
<tr>
<th>I know it's NOT</th>
<th>because...</th>
</tr>
</thead>
<tbody>
<tr>
<td>fall panicum</td>
<td>smooth crabgrass’ ligule is membranous</td>
</tr>
<tr>
<td>large crabgrass</td>
<td>the leaf blade, leaf sheath and leaf sheath margin of smooth crabgrass are hairless with the exception of some hair tufts on the collar</td>
</tr>
</tbody>
</table>
Identification clues:

**ligule**
- membranous

**leaf blade**
- hairless on both sides of the leaf blade

**leaf sheath**
- smooth, leaf sheath margins are also hairless

**seed head**
- finger-like with several thin and slender spikes, very similar to large crabgrass
Witchgrass
*Panicum capillare* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>A common annual grass found in many different soil types. One of the least competitive annual grass species.</td>
</tr>
<tr>
<td>Range</td>
<td>Throughout the province, but most prominent in central Ontario</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
</tbody>
</table>
| Competitiveness | • Corn: 1% & 5% yield loss at 1 & 5 witchgrass/m² respectively  
• Soybean: 1% & 4% yield loss at 1 & 5 witchgrass/m² respectively |
| Emergence | Typically one of the last annual grass species to emerge in the spring |

**Often mistaken for:**
fall panicum  
large crabgrass  
proso millet

<table>
<thead>
<tr>
<th>I know it's NOT</th>
<th>because...</th>
</tr>
</thead>
<tbody>
<tr>
<td>fall panicum</td>
<td>witchgrass has a hairy stem and hairy leaf sheath margin</td>
</tr>
<tr>
<td>large crabgrass</td>
<td>witchgrass has a hairy ligule</td>
</tr>
<tr>
<td>proso millet</td>
<td>the leaf blade of witchgrass is extremely hairy on both sides</td>
</tr>
</tbody>
</table>
Identification clues:

**ligule**
- hairy

**leaf blade**
- hairy on the upper and lower leaf surfaces

**leaf sheath**
- extremely hairy
- leaf sheath margins are also hairy

**seed head**
- fluffy panicle with numerous fine branches
- seed head can be up to half as long as the entire plant, about 20-40 cm long
Yellow foxtail
*Setaria glauca* (L.)

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview</strong></td>
<td>Not necessarily the most widespread annual grass species in Ontario, but perhaps the most problematic since it emerges late and is not well controlled by a number of post-emergent herbicides</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Same distribution pattern as green foxtail, throughout Ontario</td>
</tr>
<tr>
<td><strong>Resistance</strong></td>
<td>A population resistant to the triazine herbicides exists in York Region</td>
</tr>
</tbody>
</table>
| **Competitiveness** | • Corn: 1% & 5% yield loss at 1 & 5 yellow foxtail/m² respectively  
• Soybean: 1% & 5% yield loss at 1 & 5 yellow foxtail/m² respectively |
| **Emergence** | Will emerge over a lengthy period of time, but generally is considered a mid- to late-season emerging annual grass weed |

**Often mistaken for:**
- barnyard grass
- large crabgrass
- proso millet
- witchgrass

**I know it’s NOT** because...

<table>
<thead>
<tr>
<th>barnyard grass</th>
<th>yellow foxtail has a hairy ligule, barnyard grass has no ligule</th>
</tr>
</thead>
<tbody>
<tr>
<td>large crabgrass</td>
<td>yellow foxtail has a hairy ligule</td>
</tr>
<tr>
<td>proso millet</td>
<td>yellow foxtail has a flattened and hairless leaf sheath</td>
</tr>
<tr>
<td>witchgrass</td>
<td>yellow foxtail does not have a hairy stem</td>
</tr>
</tbody>
</table>
**Identification clues:**

**ligule**
- hairy

**leaf blade**
- base of leaf blade covered with a number of straggly hairs that are roughly 1-2 cm in length

**leaf sheath**
- hairless margins (outside edges)
- very flat when compared to the round sheaths of green and giant foxtail

**seed head**
- 4-6 cm in length
- bristles are darker and shorter than green or giant foxtail
Yellow nutsedge
*Cyperus esculentus* (L.)

**HOT TIP:** The old weed science 101 saying, “If it has edges, it’s a sedges” holds true. Touch the stem of yellow nutsedge and you can feel a distinct triangle-shape stem, the only prominent-“grass-like”-weed in the province with this unique characteristic.

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Perennial</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview</strong></td>
<td>Technically not a grass but rather a very aggressive sedge that thrives in moist soils within cultivated fields and a strong competitor against numerous field crops</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Found throughout the province</td>
</tr>
<tr>
<td><strong>Resistance</strong></td>
<td>No documented cases of herbicide resistance in Ontario to date. Various different biotypes exist, with each exhibiting different levels of herbicide sensitivity.</td>
</tr>
</tbody>
</table>
| **Competitiveness** | • Corn: 2% & 7% yield loss at 1 & 5 yellow nutsedge/m² respectively
• Soybean: 2% & 7% yield loss at 1 & 5 yellow nutsedge/m² respectively |
| **Emergence** | Will emerge at any point throughout the season, and emergence is greatly reduced in heavily shaded areas |
Identification clues:

**leaf blade**
- hairless with a prominent mid rib
- numerous leaves come out at the base of the plant

**leaf sheath**
- closed forming a 3-sided, triangle shape around the stem

**rhizomes**
- light brown to whitish

**tubers**
- located at the tip of the rhizome
- mature tubers are dark brown, newly formed tubers start out white

**seed head**
- cluster of yellowish to brownish branches at the tip of the stem
# Weeds to watch

## Long-spined sandbur

*Cenchrus longispinus* (Hack.) Fern

<table>
<thead>
<tr>
<th>Lifecycle</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>An aggressive annual grass that inhabits lighter (sandy) soil types</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout the province</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Similar level of competitiveness as the foxtail species</td>
</tr>
<tr>
<td>Emergence</td>
<td>Considered a mid- to late-season emerging annual grass</td>
</tr>
</tbody>
</table>

### ligule
- hairy

### leaf blade
- mostly hairless, but can feel rough to the touch when stroked

### leaf sheath
- hairy margins

### seed head
- inflorescence consists of a group of spiny burs at the end of each stem

**HOT TIP:** Long-spined sandbur often gets incorrectly identified as green or giant foxtail at the seedling stage. By digging up a seedling, a prominent bur should be attached to the base of the root. Also, the soil surface may have burs.
**Weeds to watch**

**Wire-stemmed muhly**

*Muhlenbergia frondosa (Poir.) Fern*

<table>
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<tr>
<th>Lifecycle</th>
<th>Perennial</th>
</tr>
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<tbody>
<tr>
<td>Overview</td>
<td>An up and coming perennial weed in the province. Traditionally found more in the southwest, but becoming more prominent in central and eastern Ontario.</td>
</tr>
<tr>
<td>Range</td>
<td>Found throughout the province, mainly in the southwest</td>
</tr>
<tr>
<td>Resistance</td>
<td>No documented cases of herbicide resistance in Ontario to date</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>Very similar to quackgrass in terms of competitiveness</td>
</tr>
<tr>
<td>Emergence</td>
<td>Considered a mid- to late-season emerging perennial grass</td>
</tr>
</tbody>
</table>

**ligule**
- membranous, no auricle

**leaf blade**
- thin and long, tapering to a long thin point

**stem**
- slender and very wiry

**seed head**
- in flower from July to September with small, soft, somewhat silky panicles, green at first then becoming greenish-purple to purple at maturity
BayerCropScience.ca or 1 888-283-6847 or contact your Bayer CropScience representative.

Bayer CropScience is a member of CropLife Canada.

weedinfo.ca