This chapter will focus on management of individual weed species that can be problematic in cropping systems. These Weed Profiles describe the species and offer information on their management and the risk in different crops.

The seed emergence times are approximate for central and southern Minnesota. Locations farther north or farther south will need to adjust emergence dates accordingly. Please note that the seed emergence times are relative; individual sites and variations in yearly weather conditions will have an influence.

See also the Weed Biology and Weed Management Chapters for more information.
PERENNIAL GRASS

Quackgrass
*Elymus repens*  Poaceae Family

Also known as: couchgrass, couitch, creeping quackgrass, dog grass, quick grass, sand lovegrass, scutch, twitch grass

Seed emergence time: *early May, before crop planting*

<table>
<thead>
<tr>
<th>Month</th>
<th>Seed Emergence</th>
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<tbody>
<tr>
<td>March</td>
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</table>

ID: **Seedling**—sheath hairy, also reproduces from rhizomes
Roots—fibrous, rhizomes 2-8 inches, roots arise from nodes
Stems—1.5 to 3 ft tall, erect, branching at base, creeping laterally
Leaves—blades short, ear-like appendages, smooth upper, hairy lower
Flower—Dense spike, >1 inch long, ~25 seeds/stem

Risk to yield:
*Wheat*: potential losses 10% per 9 shoots/ft², up to 57%
*Corn*: potential losses of 25% to 85%
*Soybean*: potential losses of 19% to 55%

Other traits:
- Prefers fertile soils and reduced tillage, but highly adaptable
- Most rhizomes emerge from <4 inches; but may emerge from up to 8 inches deep
- Seeds have short longevity in seed bank
- Rhizomes as small as 1/2 inch can generate new plant

Risk Level

<table>
<thead>
<tr>
<th>Crop</th>
<th>Risk Level</th>
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<tbody>
<tr>
<td>Corn/Soybean</td>
<td>MEDIUM</td>
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<tr>
<td>Small grains</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Forages</td>
<td>MEDIUM</td>
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</tbody>
</table>
Reducing risk: quackgrass

Management—established populations:
- Frequent, close mowing in fall or spring
- Competitive cover crop
- Repeated harrowing
- Rototilling 4 to 6 inches deep twice during hot, dry weather
- Short fallow in a dry period for 3-6 weeks with repeated tillage to decrease reserves and dry out roots
- Moldboard plowing to deep depths
- Time mechanical control during hot dry weather

Preventing establishment:
- Tillage in spring during seedbed preparation

Long-term management:
- Crop rotation with competitive crops in fall or early spring

CAUTION:
✓ Many tillage operations will cause root fragmentation and can increase density of established populations
✓ Planting date changes usually not an effective management technique
SUMMER ANNUAL GRASS

Large crabgrass

*Digitaria sanguinalis*  Poaceae Family

Also known as: crab finger grass, hairy crabgrass, northern crabgrass, purple crabgrass

Seed emergence time: after corn emergence, mid-late June, 4 to 8 weeks

ID:
- **Seedling**—sheaths and blades densely hairy
- **Roots**—fibrous
- **Stems**—stout, smooth, up to 3 feet long, when prostrate root at joints
- **Leaves**—hairy, 1-8 inches long
- **Flower**—3-10 segments, in whorls at top of stem, Aug-Sept

Risk to yield:
- **Corn**: potential loss of 3 % at 1 plant/ft²
- **Soybean**: potential loss of 3 % at 1 plant/ft²

Other traits:
- Seed persistence in seed bank is reduced 50% in 1.5 years, 99% in 8 years
- Generally germinates from top 1.5 inches of soil; inhibited from germination at 3 inches
- Prefers dry, hot conditions
Reducing risk: large crabgrass

Management:
- Deep tillage
- Post-row crop emergence cultivation

Long-term management:
- Small grains in rotation may suppress

CAUTION:
- Spring tillage will have little effect in managing this weed.
- Flame weeding will not be effective
**ANNUAL GRASS**

**Woolly cupgrass**  
*Eriochloa villosa*  
Poaceae Family

Also known as: *hairy cupgrass*

Seed emergence time: *at corn planting, early to mid-May,*

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<thead>
<tr>
<th>Month</th>
<th>March 1</th>
<th>March 15</th>
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<th>Aug 15</th>
<th>Sept 1</th>
<th>Sept 15</th>
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</thead>
</table>

**ID:**  
- **Seedling**—Wide pointed leaf blade  
- **Roots**—Fibrous  
- **Stems**—3-5 feet tall, erect but may lie flat, lower stem purplish on young plants  
- **Leaves**—dark green, covered with fine soft hairs, one leaf margin often distinctly crinkled  
- **Flower**—head of several spikes, very woolly, spikelets in 2 rows on one side

**Risk to yield:**  
- **Corn:** potential loss of 5% at 6 plants/ft-row

**Other traits:**  
- Stems and stalks very woolly  
- Prefers moist soils in corn, soybean, small grain, and forage crops

**Risk Level**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Level</th>
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<tbody>
<tr>
<td>Corn/Soybean</td>
<td>LOW</td>
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<tr>
<td>Small grains</td>
<td>LOW</td>
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<tr>
<td>Forages</td>
<td>LOW</td>
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</tbody>
</table>
Reducing risk: woolly cupgrass

**Management:**
- Seedbed preparation like false seedbed
- Early crop planting
- Rotary hoeing kills most of first flush
- Rye cover crop

**Long-term management:**
- Crop rotation with alfalfa or winter wheat
- Plant competitive crops

**CAUTION:**
- Woolly cupgrass is a prolific seed producer
- Later-emerging cupgrass seedlings will produce less seed and may not be as critical to control
SUMMER ANNUAL GRASS

Giant foxtail
Setaria faberi  Poaceae Family

Also known as: Chinese foxtail, Chinese millet, Faber’s foxtail, giant bristlegrass, Japanese bristlegrass, nodding foxtail, tall green bristlegrass

Seed emergence time: at corn planting, mid to late May

ID:
- **Seedling**—sheaths without hairs, but blades have many short hairs
- **Roots**—Fibrous
- **Stems**—very long, slender, weak, 3-7 feet tall, may lodge at maturity
- **Leaves**—blades are flat, wide, covered with short hairs on upper surface
- **Flower**—3-8 inches long, dense, cylindrical spikelet, drooping at maturity

Risk to yield:
- **Corn**: potential losses of 14% at 3 plants/ft row
- **Soybean**: potential losses of 7% at 1 plant/ft row; 13% at 60 plants/ft row

Risk Level

<table>
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<tbody>
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<tr>
<td>Forages</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Other traits:
- Seed bank persistence is low, < 1 yr for 50% seed reduction; 5 yr for 99% seed reduction
- Likes compact, fertile soils, higher pH
- Emerges from <1 inch depths
Reducing risk:
giant foxtail

Management:
- Rotary hoeing at < 1/4 inch somewhat effective
- Prevent seed production after small grains—seed input happens after small grains harvest.
- Tilling soil 10 days after harvest will result in a 50% reduction the following year.
- Clean crop off of field.
- Winter crops like winter wheat/rye will control foxtail
- Use of rye as a cover crop
- Delayed planting

Long-term management:
- Alfalfa grown for 2 years can suppress

CAUTION:
- Mowing not effective to stop heading
- Difficult to control with flaming
**SUMMER ANNUAL GRASS**

**Yellow foxtail**  
*Setaria pumila*  
Poaceae Family

*Also known as: cattail grass, pigeongrass, yellow bristlegrass*

*Seed emergence time: at end of corn planting, late May to early June, about the time of crop planting, seed can also germinate later in the summer with adequate soil moisture*

*ID: Seedling—long hair at base of leaf only  
Roots—Fibrous  
Stems—erect, smooth, branch at base, 1-2 feet tall  
Leaves—flat, often with spiral twist, many long hairs on upper surface near base  
Flower—dense, erect spikelet, yellow at maturity*

*Risk to yield:  
Corn: potential losses can occur at densities greater than 1 plant/ft²; up to 80% loss with large infestations  
Soybean: potential losses of 5% at 1 plant/ft²*

<table>
<thead>
<tr>
<th>Month</th>
<th>Corn/Soybean</th>
<th>Small grains</th>
<th>Forages</th>
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<tbody>
<tr>
<td>March 1</td>
<td>LOW</td>
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</table>

*Other traits:  
- Moderate persistence of seed:  
  50% reduced at 5 years;  
  99% reduced at 30 years  
- Prefers compact, fertile soils  
- Intolerant of shade*
Reducing risk: yellow foxtail

Management:
- Similar to giant foxtail
- Delayed planting
- Post emergent tillage
- Narrow row spacing may shade out

Long-term management:
- Add alfalfa to rotation

CAUTION:
- Yellow foxtail may outcompete corn under low nitrogen conditions
- It can produce seed in as few as 30 days
SUMMER ANNUAL GRASS

Green foxtail
Setaria viridis  Poaceae Family

Also known as: bottlegrass, green bristlegrass, pigeongrass, wild millet

Seed emergence time: late May to early June, seed can also germinate later in the summer and fall

ID:
- Seedling—smooth, finely veined leaf; hairy sheath
- Roots—fibrous
- Stems—erect
- Leaves—smooth/hairless
- Flower—dense erect spikelet, 1-3 inches long, may have slight bend at tip, 1-3 bristles below spikelet

Risk to yield:
- Corn: potential loss of 7% at 1 plant/ft²; 56% at 8 plants/ft²
- Soybean: potential loss of 8% at 1 plant/ft²

Risk Level
- Corn/Soybean: LOW
- Small grains: LOW
- Forages: LOW

Other traits:
- Similar to giant foxtail but 1-3 feet tall; highly variable
- Prefers light-textured, fertile, moist soils
- Has allelopathic effects on corn
Reducing risk: green foxtail

Management:
similar to giant foxtail
- Delayed planting
- Post emergent tillage
- Moldboard plowing
- Mow before seeding in forages
- Narrow row spacing may shade out

Long-term management:
- Add alfalfa to rotation

CAUTION:
✓ Produces a high number of seeds that can germinate right away
ANNUAL VINING BROADLEAF

Wild buckwheat
*Polygonum convolvulus*  Polygonaceae Family

Also known as: black bindweed, false buckwheat

Seed emergence time: early to mid-May, about the same time as crop planting, most emergence is complete by mid-June

![Seedling](image)

ID: Seedling—linear cotyledons, oval- to heart-shaped leaves
Roots—taproot
Stems—smooth, slender, twining or creeping, branched at base
Leaves—alternate, heart-shaped, pointed with smooth edges
Flower—small, greenish-white, in clusters in leaf axils

Risk to yield:
Corn: potential loss of 10% at 1 plant/ft²
Soybean: potential loss of 15% at 1 plant/ft²
Wheat: potential loss of 22% at 3 stems/ft²

Risk Level

<table>
<thead>
<tr>
<th>Crop</th>
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<tbody>
<tr>
<td>Corn/Soybean</td>
<td>LOW</td>
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<td>Small grains</td>
<td>MEDIUM</td>
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<tr>
<td>Forages</td>
<td>MEDIUM</td>
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</tbody>
</table>

Other traits:
- Often mistaken for field bindweed; wild buckwheat has thin membrane around stem and very small flowers
- Medium seed dormancy (up to 5 years in seedbank)
- Most seeds emerge from 2 inches, but can emerge from up to 8 inches
- Disease host
Reducing risk: wild buckwheat

Management:
- Seedbed preparation via pre-emergent harrowing
- False seedbed
- Delayed crop planting
- Post-harvest cultivating
- Planting clean wheat seed

Long-term management:
- Forages grown for 2 or more years

CAUTION:
✔️ Often reduces crop yield and quality
✔️ Seed difficult to remove from crop seed and is a common seed contaminant
✔️ Can lead to grain storage issues of spoilage and fungi
SUMMER ANNUAL BROADLEAF

Pennsylvania smartweed
Polygonum pensylvanicum  Polygonaceae Family

Also known as: Pennsylvania knotweed, pinkweed

Seed emergence time: before corn planting, early May

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<th>Sept 1</th>
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</thead>
</table>

ID: Seedling—linear seed leaves, smooth true leaves
Roots—taproot
Stems—erect, smooth
Leaves—smooth, swollen at nodes, branching, 1 to 4 feet tall
Flower—bright pink or rose, 5 petals, flowers in short spike

Risk to yield:
Corn: potential loss of 13% at 1 plant/m²
Soybean: potential loss of 6% at 2 plants/10ft², 36% at 11 plants/10ft²
Wheat: potential loss of 13% for 2.5 plants/10ft²

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<thead>
<tr>
<th>Risk Level</th>
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<tbody>
<tr>
<td>Corn/Soybean: MEDIUM</td>
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<tr>
<td>Small grains: LOW</td>
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<tr>
<td>Forages: LOW</td>
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</tbody>
</table>

Other traits:
- 15,000+ seeds/plant
- Persistence is moderate with 50% seed reduction at 4 years, 99% reduction at 26 years
- Prefers wet spots, high fertility (N, P), acidic soils, poorly drained soils
- Emerges from <1 inch

3 to 5 leaf stage.
Reducing risk:
Pennsylvania smartweed

Management:
- Seedbed prep—early tillage
- Delayed planting
- Rotary hoeing at < 1/4 inch height
- Flaming effective at < 1 inch height

Long-term management:
- Small grain or forage in rotations for suppression

CAUTION:
✓ Can be a skin irritant and cause photosensitivity in livestock
Common lambsquarters

*Chenopodium album*  Chenopodiaceae Family

Also known as: fat-hen, lambsquarters, lambsquarters goosefoot, white goosefoot

Seed emergence time: early May, before corn planting; peak emergence at mid-late spring

ID:
- **Seedling**—whitish cast
- **Roots**—taproot, short, much branched
- **Stems**—erect, very branched, 3-4 feet tall, smooth, grooved, red-green streaks
- **Leaves**—alternate, 1-3 inches long, smooth, white coat underside, toothed edge
- **Flower**—small, green, at end of branches and in leaf axils

Risk to yield:
- Corn: potential loss of 13% at <1 plant/ft
- Soybean: potential loss of 25% at <1 plant/ft
- Barley: potential loss of 25% at 19 stems/ft²

Risk Level

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<tr>
<th>Plant Type</th>
<th>Risk Level</th>
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<tbody>
<tr>
<td>Corn/Soybean</td>
<td>MEDIUM</td>
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<tr>
<td>Small grains</td>
<td>MEDIUM</td>
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<tr>
<td>Forages</td>
<td>LOW</td>
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</tbody>
</table>

Other traits:
- Seedbank persistence is long, 50% reduced in 12 years, 99% reduced in 78 years
- Inhibition to germination is 50% at 2 inches, 100% at 4 inches
- Most seedlings emerge from <1 inch
- Adaptable to different tillage systems including no-till and compact soils
- Prefers fertile soils
- Very high seed production
- Dormancy mechanisms are overcome by light, strong temperature fluctuations, and nitrogen
- 10 to 30% of present seed may be able to germinate the next season
- Lambsquarters will emerge a few weeks before corn planting
- Under the right temperature and moisture regime, will emerge 2-3 weeks after spring tillage
Reducing risk: common lambsquarters

Management:
- Rotary hoe will control at < 1/4- inch height
- Flaming will kill at < 1/2- inch height
- Delayed planting
- Increasing tillage can increase emergence, but will decrease emergence the following year
- Crops with fast emergence can be more competitive
- Underseed small grains with legume
- Narrow rows
- Higher planting rates

Long-term management:
- Small grains, winter grains, or perennial forages can suppress

CAUTION:
- Plants that emerge late can set seed in 6 weeks
- Drought can cause seed to form early
- Host to several crop viruses
- Manure can introduce seed
ANNUAL BROADLEAF

Kochia
*Bassia scoparia*  *Chenopodiaceae* Family

Also known as: burning bush, Mexican burningbush, Mexican fireweed, mock cypress, summer cypress

Seed emergence time: very early, in April prior to crop planting, can continue into late summer

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<tr>
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</tr>
</thead>
</table>

ID: Seedling—Linear cotyledons and leaves, very hairy
Roots—taproot
Stems—smooth, green, much branched, up to 6 feet tall
Leaves—simple, hairy, 1-2 inches long, pointed, no petioles
Flower—spike with small, greenish flowers without petals in clusters at end of branches or axils

| Risk to yield: |  |
|----------------|  |
| Corn: potential losses can occur at densities greater than 7 plants/ft-row |  |
| Small grains: potential loss of 10% at 3 plants/ft² |  |

Risk Level

- Corn/Soybean: MEDIUM
- Small grains: MEDIUM
- Forages: LOW

Other traits:
- *Seedbank persistence is short; 50% reduced in <0.5 year, 99% reduced in 2 years*
- *Shallow germinator*
- *Prefers drier, warmer soils*

3 to 5 leaf stage.
Reducing risk: Kochia

Management:
- Seedbed prep, early tillage
- Delayed planting
- Plant clean crop seed
- Mowing or cutting
- Fall tillage may stop late seeding plants

Long-term management:
- Crop rotations that combine early and late sown crops

CAUTION:
- Can have good forage quality when young, but can cause nitrate poisoning under some conditions and photosensitivity in livestock
SUMMER ANNUAL BROADLEAF

Redroot pigweed
*Amaranthus retroflexus*
Amaranthaceae Family
Also known as: common amaranth, redroot amaranth, rough amaranth, rough pigweed

**ID:**
- **Seedling**—stem is red to green, smooth to slightly hairy
- **Roots**—shallow taproot, reddish
- **Stems**—erect, up to 6 feet tall, rough, freely branched if not crowded
- **Leaves**—dull green, usually up to 6 inches, ovate
- **Flower**—green, small in spikes at end of branches

**Risk to yield:**
- **Corn:** potential loss of 5% at 1 plant/ft
- **Soybean:** potential loss of 30% at 1 plant/10ft; 50% at 2 plants/10ft, 56% at 4-8 plants/10ft

**Risk Level**
- **Corn/Soybean**
  - **Medium**
- **Small grains**
  - **Low**
- **Forages**
  - **Medium**

**Seed emergence time:** mid to late spring, about the time of crop planting

Other traits:
- Seedbank persistence is moderate to long: 50% reduction in 3 years, 99% reduction in 20 years
- Depth of inhibition is 50% inhibition at 2 inches, 100% inhibition at 4 inches
- Most seedlings emerge from < 1 inch
- Germinates late, likes warm, fertile soils, usually cultivated sites, but adaptable to compact soils
- Does not tolerate low pH

Smooth pigweed
*Amaranthus hybridus*
Amaranthaceae Family
Also known as: green amaranth, green pigweed, slim amaranth, smooth pigweed

**Seedling, redroot pigweed.**

**Seedling, smooth pigweed.**

**Seedling, redroot pigweed.**

**Seedling, smooth pigweed.**
Reducing risk: pigweed

Management:
- Early OR delayed planting to avoid emergence period
- Rotary hoeing at < 1/4 inch will control
- Flaming will control at less than 1.5 inch height
- Control by preventing seed production

Long-term management:
- Add small grains to rotation
- Try a fall-planted crop or 2 years of alfalfa

CAUTION:
✓ Buckwheat is not recommended as a smother crop to control pigweeds
✓ May cause bloat in livestock
SUMMER ANNUAL BROADLEAF

Waterhemp
*Amaranthus tuberculatus*  Amaranthaceae Family

Also known as: roughfruit amaranth, roughfruit waterhemp, tall waterhemp

Seed emergence time: after corn emergence, early to mid-June, after crop planting

<table>
<thead>
<tr>
<th>ID</th>
<th>Seedling — linear cotyledons, leaves shiny</th>
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<tbody>
<tr>
<td></td>
<td>Roots — reddish-colored taproot</td>
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<tr>
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<td>Stems — smooth, erect or trailing, 3 to 8 feet tall</td>
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<td>Leaves — narrow, egg-shaped, alternate with long petioles, 3-6 inches long</td>
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<td>Flower — small, greenish, in spike at end of branches, male and female flowers on separate plants</td>
</tr>
</tbody>
</table>

Risk to yield:
Corn: potential loss of 15% at 30 plants/ft²
Soybean: potential loss of 44% at 30 plants/ft²

Risk Level

<table>
<thead>
<tr>
<th>Crop</th>
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<tr>
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</tbody>
</table>

Other traits:
- Very similar to smooth pigweed at seedling stage
- Prefers low ground, wet conditions
- Seedbank persistence is moderate: 50% reduced at 2 years, 99% reduced at 16 years
- Germinate over the entire growing season, often requires late-season control
- Rapid growth rate
- Small seed emerges from shallow depths
- MN study found waterhemp produced seed in corn up to the V10 stage, but produced no seeds after V5 stage in soybean
Reducing risk: waterhemp

Management:
- Post emergent tillage and cultivation
- Moldboard tillage might bury seed until not viable
- Increase in-row cultivation to control

Long-term management:
- Include perennials like alfalfa in rotation

CAUTION:
- ✔ Delayed planting less effective
- ✔ Spring tillage will have little effect in managing this weed
- ✔ Waterhemp is adapted to reduced tillage systems
SUMMER OR WINTER ANNUAL BROADLEAF

Wild mustard

*Sinapis arvensis*  Brassicaceae Family

Also known as: California rape, charlock, charlock mustard, corn mustard, kedlock, wild mustard

Seed emergence time: April, prior to crop planting and late summer to early fall

ID: Seedling—kidney-shaped seed leaves
Roots—taproot
Stems—erect, branched at top, 8-40 inches, coarse hairs on bottom
Leaves—lower coarsely toothed, upper leaves progressively smaller, smooth
Flower—yellow, 4 petals, in clusters at end of branches

Risk to yield:
Corn: potential loss of 18% at 1 plant/ft²
Soybean: potential loss of 20% at 1 plant/ft²
Wheat: potential loss of 35% at 9 stems/ft²

<table>
<thead>
<tr>
<th>Risk Level</th>
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<tbody>
<tr>
<td>Corn/Soybean</td>
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<tr>
<td>Small grains</td>
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<tr>
<td>Forages</td>
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Other traits:
- Seed bank persistence is low; 50% reduced <1 year, 99% reduced by 7 years
- Depth of inhibition is moderate, 50% inhibited at 2 inches, 100% inhibition at 4 inches
- Germinates early, continually, very long dormancy
- Prefers cool, moist conditions
- Prefers uncultivated, less fertile, more acidic soils, often in small grain and flax

Seedling.

3 to 5 leaf stage.

Plant.
Reducing risk: wild mustard

Management:
- Seedbed prep/tillage
- Control with buckwheat smother crop
- Rotary hoeing of small seedlings; larger plants hard to manage
- Flaming effective on small seedlings
- Delayed planting

Long-term management:
- Crop rotation out of small grains, which are not competitive with wild mustard

CAUTION:
- Seeds are very long-lived so it is difficult to deplete the seed bank
SUMMER ANNUAL BROADLEAF

Velvetleaf  
*Abutilon theophrasti*  Malvaceae Family

Also known as: butterprint, buttonweed, Indian mallow

Seed emergence time: at corn planting; early to mid-May

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<tr>
<th>Month</th>
<th>March</th>
<th>April</th>
<th>May</th>
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ID:
- **Seedling**—heart-shaped seed leaves
- **Roots**—strongly developed taproot
- **Stems**—strong, smooth, covered with soft velvety hairs, erect, 6-8 feet tall
- **Leaves**—large, heart-shaped, soft, velvety hairy surface
- **Flower**—large, 3/4 inch, 5 yellow petals, in axils

**Risk to yield:**
- **Corn**: potential loss of 34% at 3 plants/ft row
- **Soybean**: potential loss of 40% at 3 plants/10ft row; 53% at 6-12 plants/10ft row
- **Wheat**: potential loss of 28% at 3 plants/ft row

**Risk Level**

- **Corn/Soybean**  
  - HIGH
- **Small grains**  
  - LOW
- **Forages**  
  - LOW

**Other traits:**
- Seedbank persistence high, 50% reduced in 8 years, 99% reduced in 56 years
- Not persistent in seed bank unless very deep in soil profile
- Depth of inhibition low, 50% inhibition at 3 inches, 100% inhibition at 5 inches
- Most seedlings emerge from <2 inches
- Prefers compact, fertile soils, high pH, high N
Reducing risk: velvetleaf

Management:
- Seedbed prep, early planting
- Rotary hoeing at < 1/4 inch will only be somewhat effective on plants that emerge from 2 inch depths.
- Flaming can be effective when small
- Reduced tillage systems

Long-term management:
- Small grains or forage in rotation

CAUTION:
- Planting date changes may not be effective due to long emergence period
- Tillage stimulates germination

Flowers.
**SUMMER ANNUAL BROADLEAF**

**Eastern black nightshade**  
*Solanum ptycanthum*  
*Solanaceae* Family

Also known as: *nightshade, West Indian nightshade*

**Seed emergence time:** at end of corn planting, early to mid-June

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<tr>
<th>Month</th>
<th>March</th>
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**ID:**  
- **Seedling**—round seed leaves, leaves sparsely hairy  
- **Roots**—taproot (stems will also root)  
- **Stems**—erect to trailing, widely branching, 1-2 feet tall  
- **Leaves**—oval, 1-3 inches long, edges wavy  
- **Flower**—white, 5 lobed, star-shaped, yellow center, in small clusters

**Risk to yield:**  
- **Corn:** potential loss of 7% at 1 plant/ft²  
- **Soybean:** potential loss of 40% at 1 plant/ft²  
- **Wheat:** potential loss of 10% for 10 plants/10ft

**Risk Level**

<table>
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<tr>
<th>Crop</th>
<th>Level</th>
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<tr>
<td>Corn/Soybean</td>
<td>MEDIUM</td>
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<tr>
<td>Small grains</td>
<td>LOW</td>
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<td>Forages</td>
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**Other traits:**  
- Depth of inhibition is 50% at 2 inches, 100% at 4 inches  
- Most seedlings emerge from < 1 inch  
- Prefers fertile soils  
- Emerges after lambsquarters  
- Moderate seed persistence  
- Not strongly competitive with crop  
- Shade tolerant
Reducing risk:
Eastern black nightshade

Management:
- Post emergent tillage and cultivation
- Delayed planting
- Rotary hoeing at < 1/4 inch will control
- Flaming is effective on seedlings
- Narrow row spacing
- Harvest late to avoid soybean staining

Long-term management:
- Small grains or forage rotation very effective

CAUTION:
✓ Berries can cause staining during soybean harvest even at low populations
Common ragweed

*Ambrosia artemisiifolia*  Asteraceae Family

Also known as: annual bursage, annual ragweed, short ragweed

Seed emergence time: at corn planting, early to mid-May

**ID:**

- **Seedling**—1st true leaves with 3 lobes
- **Roots**—shallow taproot
- **Stems**—rough, hairy, erect, branched, 1-4 feet tall
- **Leaves**—nearly smooth, deeply cut into many lobes
- **Flower**—2 kinds; male (pollen) in small clusters at branch tips, fewer female (seed) found at base of leaves and forks of upper branches

**Risk to yield:**

- **Corn:** potential loss of 21% at 1 plant/ft²
- **Soybean:** potential loss of 30% at 2 plants/10ft
- **Wheat:** potential loss of 30% at 2 plants/10ft

**Risk Level**

- Corn/Soybean: MEDIUM
- Small grains: LOW
- Forages: LOW

**Other traits:**

- *Seed persistence is low,* 50% reduced = <1.5 years; 99% reduced = 10 year
- **Prefers poor fertility**
- **Emerges from < 2 inches depth**
Reducing risk:
common ragweed

Management:
- Tillage controls new seedlings but stimulates germination
- Early OR delayed planting to avoid emergence period
- Rotary hoe controls at < 1/4 inch height
- Mowing
- High crop plant populations

Long-term management:
- Small grains in rotation can suppress

CAUTION:
✓ Flaming not effective
Giant ragweed
*Ambrosia trifida*  Asteraceae Family

Also known as: crownweed, great ragweed, horse-cane

Seed emergence time: before corn planting, early May

ID:
- **Seedling**—1st true leaves with 5 lobes
- **Roots**—taproot
- **Stems**—coarse, rough-hairy, 3-15 feet tall
- **Leaves**—opposite, large, some hairs, 3 or 5 lobes
- **Flower**—2 kinds, many male in clusters on branch tips, few female in axils of upper leaves

Risk to yield:
- **Corn**: potential loss of 55% at 1 plant/10ft²
- **Soybean**: potential loss of 52% at 1 plant/10ft²
- **Wheat**: potential loss of 54% at 1 plant/10ft²

Risk Level

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<td>Forages</td>
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Other traits:
- **Prefers** fertile, moist soils, and disturbed areas
- **Weed** persistence is low; 50% reduced in <0.5 year; 99% reduced in 2 years
- **Early emergence** but continues to emerge over a long period of time
- **Emerges** from < 6 inches
Reducing risk: giant ragweed

Management:
- Seedbed prep
- Mowing
- Delayed planting
- Tillage controls emerged seedlings but stimulates more emergence
- Highly competitive crops that can be planted late

Long-term management:
- Small grains or alfalfa/red clover in rotation

CAUTION:
✓ Rotary hoeing may not be effective
✓ Flaming not effective
Canada thistle

*Cirsium arvense*  Asteraceae Family

Also known as: Californian thistle, creeping thistle, field thistle

Seed emergence time: mid to late May, about the time of crop planting

**ID:**
- **Seedling**—spiny
- **Roots**—extend several feet down and horizontally
- **Stems**—erect, 2-5 feet tall, branches at top, hairiness increases with maturity
- **Leaves**—oblong, crinkled edge, spiny, lobed and hairy beneath
- **Flower**—numerous, compact, 3/4 inch, purplish, male and female flowers usually on different plants

**Risk to yield:**
- **Corn:** potential loss of 5% at 5 shoots/row-ft
- **Wheat:** potential loss of 38% at 14 shoots/10 row-ft

**Other traits:**
- **Depth of inhibition:**
  - 50% inhibition at 2 inches;
  - 100% inhibition at 4 inches
- Most seedlings emerge from <1 inch
- Prefers field edges
- Most is spread from extensive root system
- Not shade tolerant

Listed on MN Noxious Weed list
Reducing risk: Canada thistle

Management—established populations:
- Mid-season crop planting
- Fall tillage
- Frequent moldboard plowing
- Mowing to prevent seed set
- Take action when flower buds are present to reduce root reserves
- Shoots emerge 10 days after disking—will need to be done every 3 weeks or so to deplete reserves.
- Rotary hoe/disc/tillage can spread thistle

Long-term management:
- Alfalfa, sweet clover, buckwheat, or sudangrass in rotation

CAUTION:
✓ Don’t rely on one management technique to control established populations; Canada thistle will need several levels and modes of management.
SUMMER OR WINTER ANNUAL BROADLEAF

Horseweed

*Conyza canadensis*  Asteraceae Family

Also known as: Canada horseweed, Canadian horseweed, fleabane, hogweed, fleabane, marestail

**Seed emergence time:** March, very early spring or in the fall, sometimes during summer

**ID:** Seedling—ovate seed leaves, hairless
   Roots—short taproot
   Stems—erect, stout, unbranched at base, 1 to 6 feet tall, bristly hairs
   Leaves—numerous, dark green with scattered coarse white bristles
   Flower—many small, greenish white with yellow centers

**Risk to yield:**
Corn: potential loss of 5% at 7 plants/row-ft
Wheat: potential loss of 83% at 11 stems/ft²

**Other traits:**
- Prefers coarse, fertile, or well-drained soils; tolerates drought well
- Emerges from < 1 inch
- Germinates readily from mature parent plant, wind disseminated
- Not shade tolerant
Reducing risk: horseweed

Management:
- Fall tillage
- Delayed planting
- Narrow rows
- High crop populations

Long-term management:
- Small grains in rotation can suppress

CAUTION:
✓ Seeds can germinate as soon as they drop from parent plant
SUMMER ANNUAL BROADLEAF

Common sunflower
*Helianthus annuus*  Asteraceae Family

Also known as: annual sunflower, garden sunflower, sunflower, wild sunflower

Seed emergence time: *early May, before corn planting*

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ID:  
- **Seedling**—*large seed leaves, rough leaf surface*
- **Roots**—*fibrous*
- **Stems**—*erect, thick, rough, 2 to 10 feet tall, freely branching*
- **Leaves**—*alternate, rough, hairy, toothed margins*
- **Flower**—*1 to 5 inches diameter, yellow with brown disk center*

Risk to yield:  
Corn: potential loss of 5% at 1 plant/row-ft

Other traits:  
- Seedbank persistence low: 50% reduced at <0.5 year; 99% reduced at 2 years
Reducing risk: common sunflower

Management:
- Seedbed prep
- Delayed planting
- Moldboard or chisel plowing in spring

Long-term management:
- Forages in rotation

CAUTION:
- Sunflower is one of the most competitive weeds
- Can cause nitrate poisoning in livestock
SUMMER ANNUAL BROADLEAF

Cocklebur

*Xanthium strumarium*  
*Asteraceae Family*

Also known as: *broad cocklebur, burweed, common cocklebur, rough cocklebur*

**Seed emergence time:** *mid to late May, at the end of corn planting, 4 to 8 weeks*

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**ID:**
- **Seedling**—linear seed leaves, leaves rough
- **Roots**—stout, woody taproot
- **Stems**—erect, usually bushy, ridged, rough, hairy, purple spots, 2-4 feet tall
- **Leaves**—triangle to heart-shaped, toothed edges, rough
- **Flower**—small, male and female flowers separate but born together in clusters in axils

**Risk to yield:**
- **Corn:** potential loss of 10% at 2 plants/ft
- **Soybean:** potential loss of 4% at 1 plant/10ft; 47% at 13 plants/10ft

**Other traits:**
- **Seedbank persistence high:** 50% reduced at 6 years; 99% reduced at 37 years
- **Most competitive with soybean**
- **Stems interfere with harvest**

Risk Level

- **Corn/Soybean**: HIGH
- **Small grains**: LOW
- **Forages**: MEDIUM
Reducing risk: cocklebur

Management:
- Delayed planting

Long-term management:
- Crop rotation
- Reduced tillage

CAUTION:
- Plants with immature seed heads left in field can still produce viable seed
- Difficult to control with shallow tillage, rotary hoeing
- Seedlings and seed are poisonous to livestock
- Burying seed can aid in seed emergence
FOR MORE INFORMATION


Is this plant a weed? University of Minnesota Extension http://www.extension.umn.edu/gardeninfo/weedid/index.html


Iowa State University Extension, Weed Emergence Sequences http://ipm.illinois.edu/weeds/WeedEmergePoster.pdf

Ontario Weeds http://www.ontarioweeds.com/


REFERENCES


Iowa State University Extension, Weed emergence sequences http://ipm.illinois.edu/weeds/WeedEmergePoster.pdf


