

## CHAPTER 7

# Weed Profiles

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**T**his 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.



*Common milkweed in small grains.*

PERENNIAL GRASS

# Quackgrass

*Elymus repens* Poaceae Family

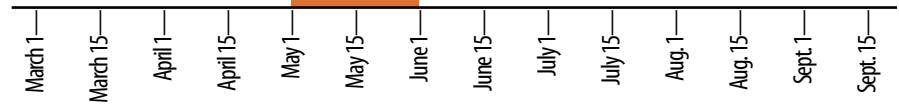


STRAND MEMORIAL HERBARIUM

Seedling.

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

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



**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



OHIO STATE WEED LAB

3 to 5 leaf stage.

**Risk to yield:**

**Wheat:** potential losses 10% per 9 shoots/ft<sup>2</sup>, up to 57%

**Corn:** potential losses of 25% to 85%

**Soybean:** potential losses of 19% to 55%

Risk Level		
Corn/Soybean		MEDIUM
Small grains		MEDIUM
Forages		MEDIUM

**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



DOUGLAS LADD, INCRS- USDA

Spike.



UNIVERSITY OF MINNESOTA

Plant.



**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



UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

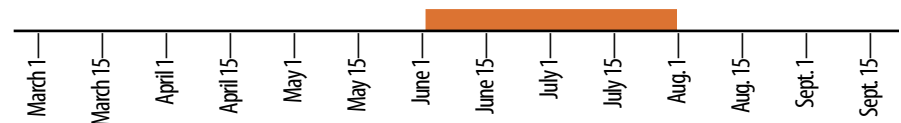


UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**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/ft<sup>2</sup>*

**Soybean:** *potential loss of 3 % at 1 plant/ft<sup>2</sup>*

Risk Level		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW



REBEKAH D. WALLACE, UNIVERSITY OF GEORGIA

Spike.

**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*

SUMMER ANNUAL GRASS



Reducing risk:  
large crabgrass

**Management:**

- *Deep tillage*
- *Post-row crop emergence cultivation*

**Long-term management:**

- *Small grains in rotation may suppress*

UNIVERSITY OF MINNESOTA EXTENSION, BOB MUGAAS



*Plant.*

**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



UNIVERSITY OF MINNESOTA EXTENSION

Seedling.



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

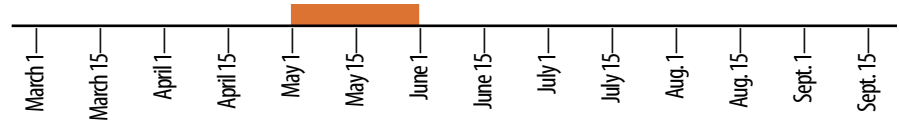


STRAND MEMORIAL HERBARIUM

Plant.

**Also known as:** *hairy cupgrass*

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



**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		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW



**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*



STRAND MEMORIAL HERBARIUM

*Spike.*

**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

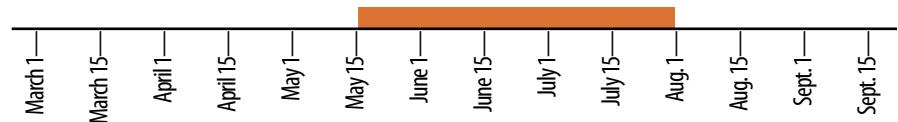


UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**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*



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**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		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW



STRAND MEMORIAL HERBARIUM

Plants.

**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*



ROBERT H. MOHLENBROCK, NCRS-USDA

*Spike.*

SUMMER ANNUAL GRASS

# Yellow foxtail

*Setaria pumila* Poaceae Family

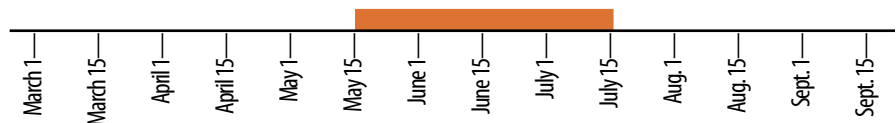


UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**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*



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**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/ft<sup>2</sup>; up to 80% loss with large infestations*

**Soybean:** *potential losses of 5% at 1 plant/ft<sup>2</sup>*

Risk Level		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW



STRAND MEMORIAL HERBARIUM

Plants.

**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*



OHIO STATE WEED LAB

*Spike.*

**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



UNIVERSITY OF MINNESOTA EXTENSION

Seedling.



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

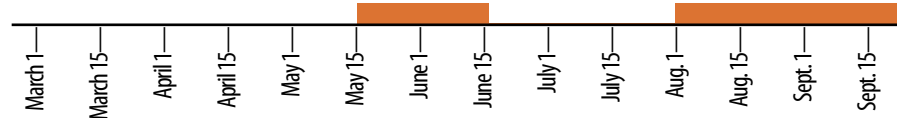


OHIO STATE WEED LAB

Plants.

**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/ft<sup>2</sup>; 56% at 8 plants/ft<sup>2</sup>*

**Soybean:** *potential loss of 8% at 1 plant/ft<sup>2</sup>*

Risk Level		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	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*



WENDY VANDYK EVANS.

*Spike.*

**CAUTION:**

- ✓ *Produces a high number of seeds that can germinate right away*

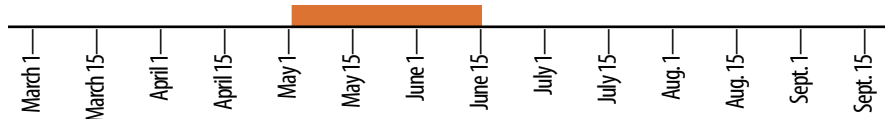
ANNUAL VINING BROADLEAF

# 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*



STRAND MEMORIAL HERBARIUM

Seedling.

**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/ft<sup>2</sup>*

*Soybean: potential loss of 15% at 1 plant/ft<sup>2</sup>*

*Wheat: potential loss of 22% at 3 stems/ft<sup>2</sup>*




STRAND MEMORIAL HERBARIUM

3 to 5 leaf stage.

Risk Level		
Corn/Soybean	<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span>	LOW
Small grains	<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	MEDIUM
Forages	<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	MEDIUM

**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*



STRAND MEMORIAL HERBARIUM

*Plant.*

**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*



THE WEED SCIENCE SOCIETY OF AMERICA

*Flowers.*

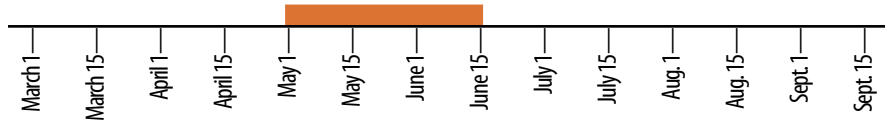
SUMMER ANNUAL BROADLEAF

# Pennsylvania smartweed

*Polygonum pennsylvanicum* Polygonaceae Family

Also known as: *Pennsylvania knotweed, pinkweed*

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



UNIVERSITY OF MINNESOTA EXTENSION

**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/m<sup>2</sup>  
**Soybean:** potential loss of 6% at 2 plants/10ft<sup>2</sup>, 36% at 11 plants/10ft<sup>2</sup>  
**Wheat:** potential loss of 13% for 2.5 plants/10ft<sup>2</sup>

Risk Level	
Corn/Soybean	<span style="color: orange;">■</span> MEDIUM
Small grains	<span style="color: green;">■</span> LOW
Forages	<span style="color: green;">■</span> LOW

Seedling.



UNIVERSITY OF MINNESOTA EXTENSION

- 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.



SUMMER ANNUAL BROADLEAF



STRAND MEMORIAL HERBARIUM

*Plant.*



STRAND MEMORIAL HERBARIUM

*Flowers.*



**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*

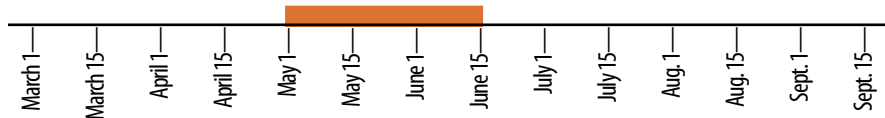
ANNUAL BROADLEAF

# 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*



UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**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/ft<sup>2</sup>*

Risk Level		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: orange;"></span>	MEDIUM
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: orange;"></span>	MEDIUM
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: darkgreen;"></span>	LOW



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**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*



Plant.



Flowers.



**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*

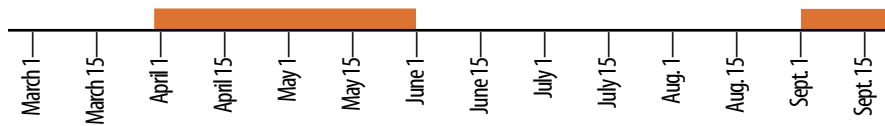
ANNUAL BROADLEAF

# 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*



UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**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/ft<sup>2</sup>*

Risk Level	
Corn/Soybean	MEDIUM
Small grains	MEDIUM
Forages	LOW



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**Other traits:**

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



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*



STEVE DEWEY, UTAH STATE UNIVERSITY

*Plant.*



ROBERT H. MOHLENBROCK, NRCS-USDA

*Flowers.*

SUMMER ANNUAL BROADLEAF

# Redroot pigweed

*Amaranthus retroflexus*  
**Amaranthaceae Family**

**Also known as:** *common amaranth, redroot amaranth, rough amaranth, rough pigweed*



Seedling, redroot 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



3 to 5 leaf stage, redroot pigweed.

**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

# Smooth pigweed

*Amaranthus hybridus*  
**Amaranthaceae Family**

**Also known as:** *green amaranth, green pigweed, slim amaranth, smooth pigweed*

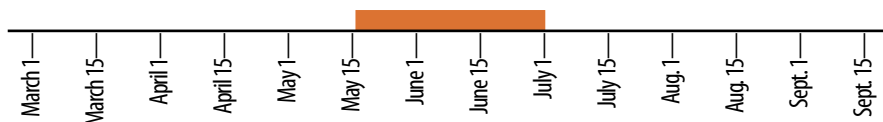


Seedling, smooth pigweed.



3 to 5 leaf stage, smooth pigweed.

**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

## SUMMER ANNUAL BROADLEAF



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*



STRAND MEMORIAL HERBARIUM

*Flowers, redroot pigweed.*



STRAND MEMORIAL HERBARIUM

*Plant, redroot pigweed.*

SUMMER ANNUAL BROADLEAF

# Waterhemp

*Amaranthus tuberculatus* Amaranthaceae Family



OHIO STATE WEED LAB

Seedling.



OHIO STATE WEED LAB

3 to 5 leaf stage.

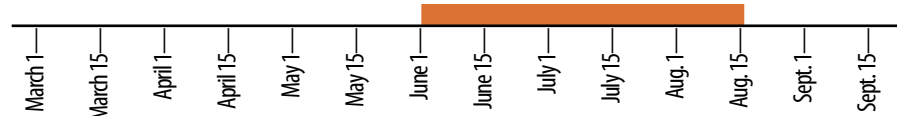


OHIO STATE WEED LAB

Plant.

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

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



**ID: Seedling**—linear cotyledons, leaves shiny

**Roots**—reddish-colored taproot

**Stems**—smooth, erect or trailing, 3 to 8 feet tall

**Leaves**—narrow, egg-shaped, alternate with long petioles, 3-6 inches long

**Flower**—small, greenish, in spike at end of branches, male and female flowers on separate plants

**Risk to yield:**

**Corn:** potential loss of 15% at 30 plants/ft<sup>2</sup>

**Soybean:** potential loss of 44% at 30 plants/ft<sup>2</sup>

Risk Level		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400; border: 1px solid black;"></span>	LOW
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400; border: 1px solid black;"></span>	LOW
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400; border: 1px solid black;"></span>	LOW

**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



## SUMMER ANNUAL BROADLEAF



### 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*



ROBERT H. MOHLENBROCK, NCRS-USDA

*Flowers.*

SUMMER OR WINTER ANNUAL BROADLEAF

# Wild mustard

*Sinapis arvensis* Brassicaceae Family

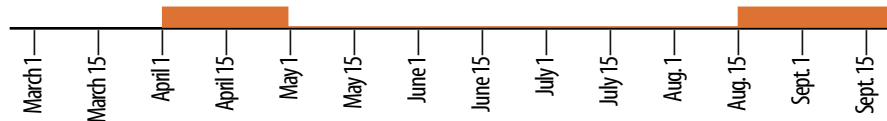


UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**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*



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**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/ft<sup>2</sup>*

**Soybean:** *potential loss of 20% at 1 plant/ft<sup>2</sup>*

**Wheat:** *potential loss of 35% at 9 stems/ft<sup>2</sup>*

Risk Level		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #800000;"></span>	HIGH
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #006400;"></span>	LOW



STRAND MEMORIAL HERBARIUM

Plant.

**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*

## SUMMER OR WINTER ANNUAL BROADLEAF



**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*



STRAND MEMORIAL HERBARIUM

*Flowers.*

SUMMER ANNUAL BROADLEAF

# Velvetleaf

*Abutilon theophrasti* Malvaceae Family

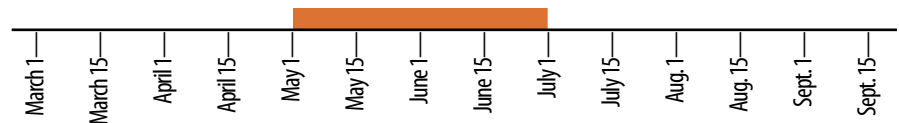


UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**Also known as:** *butterprint, buttonweed, Indian mallow*

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



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**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	<span style="color: red;">■</span>	HIGH
Small grains	<span style="color: green;">■</span>	LOW
Forages	<span style="color: green;">■</span>	LOW



STRAND MEMORIAL HERBARIUM

Plant.

**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*



STRAND MEMORIAL HERBARIUM

*Flowers.*

SUMMER ANNUAL BROADLEAF

# Eastern black nightshade

*Solanum ptycanthum* Solanaceae Family



UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

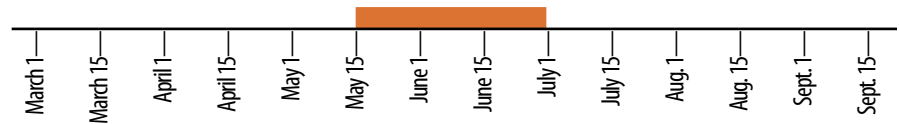


UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**Also known as:** *nightshade, West Indian nightshade*

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



**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/ft<sup>2</sup>*

**Soybean:** *potential loss of 40% at 1 plant/ft<sup>2</sup>*

**Wheat:** *potential loss of 10% for 10 plants/10ft*

Risk Level	
Corn/Soybean	MEDIUM
Small grains	LOW
Forages	MEDIUM

**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*



STRAND MEMORIAL HERBARIUM

*Plant and Flowers.*

SUMMER ANNUAL BROADLEAF

# Common ragweed

*Ambrosia artemisiifolia* Asteraceae Family

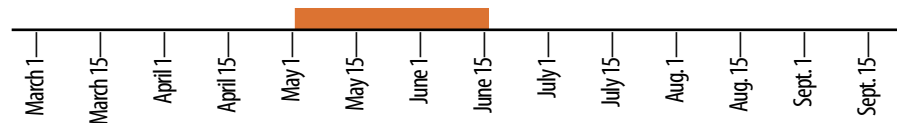


UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**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/ft<sup>2</sup>*

**Soybean:** *potential loss of*

*30% at 2 plants/10ft*

**Wheat:** *potential loss of*

*30% at 2 plants/10ft*

Risk Level		
Corn/Soybean	<span style="color: orange;">■</span>	MEDIUM
Small grains	<span style="color: darkgreen;">■</span>	LOW
Forages	<span style="color: darkgreen;">■</span>	LOW



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**Other traits:**

- *Seed persistence is low, 50% reduced = <1.5 years; 99% reduced=10 year*

- *Prefers poor fertility*

- *Emerges from < 2 inches depth*



STRAND MEMORIAL HERBARIUM

Plant.





Flowers.



**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*

SUMMER ANNUAL BROADLEAF

# Giant ragweed

*Ambrosia trifida* Asteraceae Family

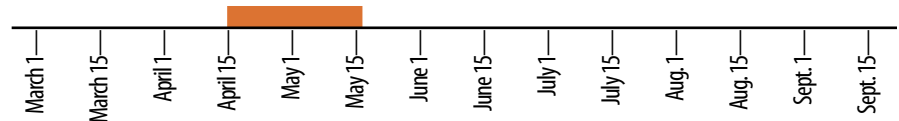


UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

**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/10ft<sup>2</sup>*

**Soybean:** *potential loss of 52% at 1 plant/10ft<sup>2</sup>*

**Wheat:** *potential loss of 54% at 1 plant/10ft<sup>2</sup>*

Risk Level		
Corn/Soybean	<span style="display: inline-block; width: 15px; height: 15px; background-color: #800000; border: 1px solid black;"></span>	HIGH
Small grains	<span style="display: inline-block; width: 15px; height: 15px; background-color: #800000; border: 1px solid black;"></span>	HIGH
Forages	<span style="display: inline-block; width: 15px; height: 15px; background-color: #FF8C00; border: 1px solid black;"></span>	MEDIUM



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**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*



STRAND MEMORIAL HERBARIUM

Plant.

## SUMMER ANNUAL BROADLEAF

 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*



STRAND MEMORIAL HERBARIUM

*Flowers.*

PERENNIAL BROADLEAF

# Canada thistle

*Cirsium arvense* Asteraceae Family

Listed on MN Noxious Weed list

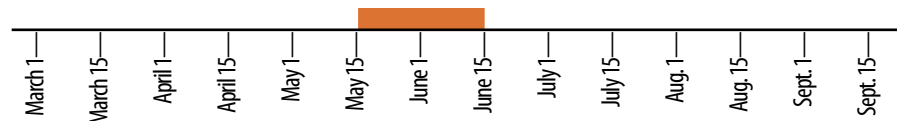


STRAND MEMORIAL HERBARIUM

Seedling.

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*

Risk Level		
Corn/Soybean	<span style="color: orange;">■</span>	MEDIUM
Small grains	<span style="color: green;">■</span>	LOW
Forages	<span style="color: maroon;">■</span>	HIGH



STRAND MEMORIAL HERBARIUM

3 to 5 leaf stage.

**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**



**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 day 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 one management technique to control established populations; Canada thistle will need several levels and modes of management*



STRAND MEMORIAL HERBARIUM

*Plant and flowers.*

SUMMER OR WINTER ANNUAL BROADLEAF

# Horseweed

*Conyza canadensis* Asteraceae Family

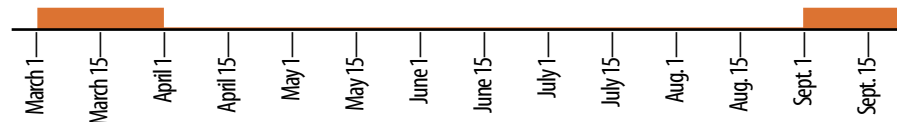


OHIO STATE WEED LAB

Seedling.

**Also known as:** *Canada horseweed, Canadian horseweed, fleabane, hogweed, fleabane, marestalk*

**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/ft<sup>2</sup>*

Risk Level		
Corn/Soybean	<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span>	LOW
Small grains	<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	MEDIUM
Forages	<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	MEDIUM



STRAND MEMORIAL HERBARIUM

3 to 5 leaf stage.

**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*

## SUMMER OR WINTER ANNUAL BROADLEAF



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*



©TED BODNER.

*Plant.*



STRAND MEMORIAL HERBARIUM

*Flowers.*

SUMMER ANNUAL BROADLEAF

# Common sunflower

*Helianthus annuus* Asteraceae Family



UNIVERSITY OF MINNESOTA EXTENSION

Seedling.

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

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



**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*



UNIVERSITY OF MINNESOTA EXTENSION

3 to 5 leaf stage.

**Risk to yield:**

*Corn: potential loss of 5% at 1 plant/row-ft*

Risk Level		
Corn/Soybean	<span style="color: #800000;">■</span>	HIGH
Small grains	<span style="color: #FFA500;">■</span>	MEDIUM
Forages	<span style="color: #FF8C00;">■</span>	MEDIUM

**Other traits:**

- *Seedbank persistence low: 50% reduced at <0.5 year; 99% reduced at 2 years*



STEVE DEWEY, UTAH STATE UNIVERSITY

Plant.



## SUMMER ANNUAL BROADLEAF



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*



EXTENSION.MISSOURI.EDU

*Plant and flowers.*



KARAN A. RAWLINS, UNIVERSITY OF GEORGIA

*Flower.*

SUMMER ANNUAL BROADLEAF

# Cocklebur

*Xanthium strumarium* Asteraceae Family

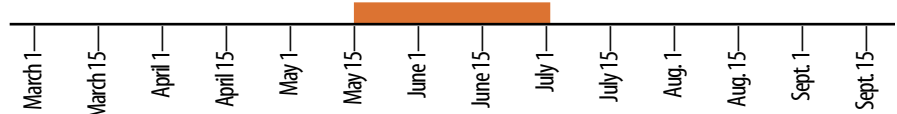
UNIVERSITY OF MINNESOTA EXTENSION



Seedling.

**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*



**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*

Risk Level	
Corn/Soybean	<span style="color: red;">■</span> HIGH
Small grains	<span style="color: green;">■</span> LOW
Forages	<span style="color: orange;">■</span> MEDIUM

UNIVERSITY OF MINNESOTA EXTENSION



3 to 5 leaf stage.

**Other traits:**

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

## SUMMER ANNUAL BROADLEAF



Reducing risk:  
cocklebur

### Management:

- *Delayed planting*

### Long-term management:

- *Crop rotation*
- *Reduced tillage*



*Plant.*

### 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

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