

<http://www.nysaes.cornell.edu/ipmnet/sare.mod/>



Weed Identification in Corn

and Other Row Crops

By Mark VanGessel

Overview

Concept	Activity	Handouts
Although we've planned for this module to be held in a cornfield, the principles apply generally to all row crops.		
Weeds can severely limit crop production in the Northeast. Weed management includes: ♦ cultural management ♦ mechanical management ♦ biological management ♦ chemical management Knowing how to identify and classify weeds is a crucial first step to choosing the most effective method of managing weeds.	#1: How Do We Use a Key to Identify Weeds?	A. Grass and Grasslike Plants: Key Terms B. Broadleaf Plants: Key Terms C. Vegetative Key: Seedling Grass and Grasslike Weeds D. Vegetative Key: Seedling Broadleaf Weeds E. Grass and Grasslike Weed Chart F. Broadleaf Weed Chart G. Shortcut Identification Tables
Resources: Uva, R. H., J. C. Neal, and J. M. DiTomaso. 1997. <i>Weeds of the Northeast</i> Penn State Field Crop IPM Training Reference Manual, appendix of resource materials Peterson, any edition <i>Field Guide to Wildflowers</i> http://www.rec.udel.edu/weed_sci/Corn_weed_book/cornweed.pdf		Related topics: Module 10: Weed Management in Row Crops

Here's what you'll do:

Beforehand:

- ♦ Arrange to meet at a participant's farm and be sure you've got trowels and weeders on hand, or ask people to bring them. Schedule this for early in the season so people learn how to identify weeds while they are small and they can still do something about them.

Today, on site:

- ♦ Learn how to observe and describe characteristics of plants;
- ♦ Show how different types of plant characteristics are *key* to knowing what a plant is—and how to use a diagnostic key;
- ♦ Understand why knowing plant characteristics is *key* to knowing how to deal with them.

Note: This module isn't intended to be a comprehensive introduction to weed identification. The keys include many but not all common weeds in the Northeast or weeds included may not be a problem in your area.

<http://www.nysaes.cornell.edu/ipmnet/sare.mod/>



Weed Identification in Row Crops

ACTIVITY #1: How Do We Use a Key to Identify Weeds?

Setting	Time Required	Materials	Handouts
A farmer's cornfield in late spring or early summer when annual weeds are still in seedling stage Group size: up to 12 is easiest	1 hour	Hand lens, small jackknife, trowels or weeders Reference: Weeds of the Northeast	A. Grass and Grasslike Plants: Key Terms B. Broadleaf Plants: Key Terms C. Vegetative Key: Seedling Grass and Grasslike Weeds D. Vegetative Key: Seedling Broadleaf Weeds E. Grass and Grasslike Weed Chart F. Broadleaf Weed Chart G. Shortcut Identification Tables

Q:	Pose a series of questions:	A:								
Why is it important to correctly identify weeds? <i>Among other things</i>	Not all species will respond the same way to a given approach. ID-ing weeds helps you fit the cure to the condition. You can detect early changes in the species composition in a field. You can evaluate the effectiveness of a previous weed management method. If weeds are present, is it due to poor performance or is it because the species is not susceptible to that particular method? Are the species present going to reduce yield? Knowing your weeds helps you determine if something should be done. Weeds are easier to control or manage if treatment is started with small plants. You need to know how to identify plants in the seedling stage.									
<i>Hand out Grass and Grasslike Plants: Key Terms. As you go through the next step, have the group compare leaf and stem characteristics with the diagrams on the handout. Note especially:</i> <table><tr><td><i>ligule</i></td><td><i>tiller</i></td></tr><tr><td><i>collar</i></td><td><i>auricle</i></td></tr><tr><td><i>stem</i></td><td><i>leaf blade</i></td></tr><tr><td><i>sheath</i></td><td></td></tr></table>			<i>ligule</i>	<i>tiller</i>	<i>collar</i>	<i>auricle</i>	<i>stem</i>	<i>leaf blade</i>	<i>sheath</i>	
<i>ligule</i>	<i>tiller</i>									
<i>collar</i>	<i>auricle</i>									
<i>stem</i>	<i>leaf blade</i>									
<i>sheath</i>										
Dig up a corn plant with roots. (Corn, after all, is just a big grass... and it's easy to see all its features.) Have the group describe the plant morphologically, and ask:	◆ Can you tell from the roots if this an annual or perennial grass? How? ◆ What do you see where the blade meets the stem? (<i>Collar region.</i>) ◆ What features (if present) are found in the collar region? (<i>Define “ligule” and “auricle.” Note that each comes in three different styles—including none at all.</i>)									

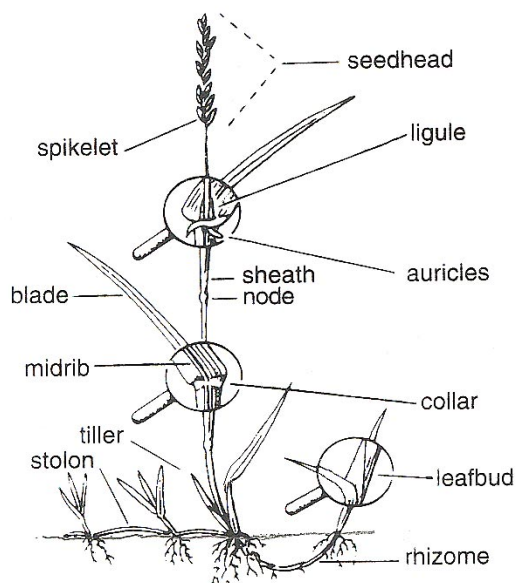
Q:	More questions:	A:
<i>continue...</i>	◆ Notice how the blade continues down along the stem—do you know what that’s called? (Define “sheath.”) ◆ What about the leaves themselves—are they rough or smooth—or hairy? If leaf hairs are present, are they on the upper, lower, or both sides? Find examples of different “hair styles” (or types). ◆ Look for emerging leaf blades, or “leafbuds.” How would you describe them? (<i>Show the “rolled” leafbuds.</i>) ◆ Note any other leaf and stem characteristics—color of sheath, stem, or leaves; stem bent at nodes; leaf midrib white or prominent (or both); hairs on collar; triangular stems and shiny blade	
<i>Divide your group into two teams one having fewer members than the other. Hand out the trowels and weeders. Ask the smaller team to dig as many different kinds of grass or grasslike weeds as they can find in 10 minutes. Ask the other team to do likewise with broadleaf weeds (and be sure everyone knows the difference). When everyone returns, spread the weeds out on the tailgate of someone s truck.</i>		
<i>Refer to Grass and Grasslike Plants: Key Terms as needed.</i> <i>Look at the grasses first. Have the “grass” team observe and describe— one plant at a time—as many different plant characteristics as they can.</i> <i>You ll use the same questions you used in describing the corn plant but notice some variations.</i> <i>Encourage each team member to describe one weed attribute. Cycle through the team till they are done.</i>	◆ Can you tell if this an annual or perennial grass? How? (<i>Compare different root structures and speculate about what they indicate.</i>) ◆ What do you see where the blade meets the stem? (<i>Collar region.</i>) ◆ What features (if present) are found in the collar region? ◆ Where is the sheath? ◆ What about the leaves themselves—are they rough or smooth—or hairy? If leaf hairs are present, are they on the upper, lower, or both sides? Find examples of different “hair styles” (or types). ◆ Look for emerging leaf blades, or “leafbuds.” How would you describe them? (<i>Show the difference between “rolled” and “folded” leafbuds.</i>) ◆ Note any other leaf and stem characteristics—color of sheath, stem, or leaves; stem bent at nodes; leaf midrib white or prominent (or both); hairs on collar; triangular stems and shiny blade.	
<i>Look again at the corn plant you dug up and find the attached seed. Now look through your pile of small grass plants to find one with a seed attached to the roots. (If you don t find one in your pile, carefully dig another.)</i>	What does the seed look like? ◆ Describe its relative size, overall shape, and any distinctive traits (ridging, burs). <i>Seed characteristics are distinctive features of grasses. An important tool for identifying small grasses is the seed attached to its root system.</i>	
<i>Hand out the Vegetative Key: Seedling Grass and Grasslike Weeds, Grass and Grasslike Weed Chart , and Shortcut Identification Tables.</i> <i>Cycle through the entire group, having two members at a time follow the key to identify each grass or grasslike plant. Have them confirm their diagnoses with the Grass and Grasslike Weed Chart , Shortcut Identification Table, or your copy of Weeds of the Northeast. (See resource section, p.1.)</i>		
<i>Hand out Broadleaf Plants: Key Terms. As you go through the next step, have the group compare leaf and stem characteristics with the diagrams on the handout. Note especially:</i> ◆ <i>Leaf arrangements:</i> opposite alternate whorled ◆ <i>Leaf shapes, simple:</i> linear oblong elliptic lanceolate ovate obovate spatulate dissected		

Q:	<i>Pose a series of questions:</i>	A:
<i>continued...</i> ◆ <i>Leaf shapes, compound:</i> <i>pinnate bipinnate palmate</i> ◆ <i>Leaf margins:</i> <i>entire lobed serrated crenate dentate</i>		
Now it's the broadleaf team's turn. Have them observe and describe as many different plant characteristics as they can among the weeds they just dug up. <i>Encourage each team member to describe one attribute. Cycle through the team till they are done.</i>	◆ Can you tell if this an annual or perennial weed? How? (<i>Look at root structures and speculate about what they mean.</i>) ◆ Do you see any seeds attached to the roots of small broadleaf plants? Why not? Who can define "cotyledon"? What is it? (<i>Cotyledons are preformed in the seeds and take up virtually all the space in the seed.</i>) ◆ Where are the cotyledons, and how do they differ from plant to plant? <i>Note that shape varies: they may be oval, heart-shaped, kidney shaped, lance shaped, or round; they may be butterfly shaped, with broad or narrow wings; some are thick and waxy.</i> ◆ Look at the true leaves. Are they arranged on the stem in an "alternate" or "opposite" fashion? (<i>Sometimes the first set of true leaves is different from leaves that develop later.</i>) ◆ How would you describe the shapes of the leaves? What about their margins? Their texture? (<i>Check both surfaces.</i>) Their veins? Color? Any distinctive odor when you crush a leaf? ◆ Who knows what a petiole is? Does your plant have petioles? Is there anything unusual about the way the stem, petiole, and leaf come together? ◆ Now describe the stems. Do they branch often? Are they upright, prostrate (<i>fish for the definition</i>) or somewhere in between? Tall or short? Hairy or smooth? Ridged, square, round, woody? What color? Is the color flecked or splotchy? ◆ Do you see a milky sap when a stem or leaf is cut? ◆ Do any of these plants have tendrils?	
<i>Hand out the Vegetative Key: Seeding Broadleaf Weeds and the Broadleaf Weed Chart.</i> <i>Cycle through the entire group, having two members at a time follow the key to identify each broadleaf weed. They should confirm their diagnosis with the Broadleaf Weed Chart, Shortcut Identification Table, or your copy of Weeds of the Northeast.</i>		
<i>Even though these keys don't rely on flower characteristics after all, we're focused here on small, postemergence weeds it won't hurt to flip through Peterson's Guide to Wildflowers.</i> <i>Show how flowers may be classified by number and arrangement of sepals and petals, as well as by type of inflorescence. If you've got some mustard or chickweed handy, they provide excellent examples.</i>		
<i>Make a pitch for attending the next workshop .</i> <i>Ask these questions, and say that the next workshop answers them:</i>		
◆ Do all weeds reduce yields equally? ◆ What characteristics make some weed species more competitive than others? ◆ What is the weed density in this field? ◆ Are the weeds plentiful enough to justify managing them?		

A. Grass and Grasslike Plants: Key Terms

Handout for Activity 1

Key parts of a grass plant:

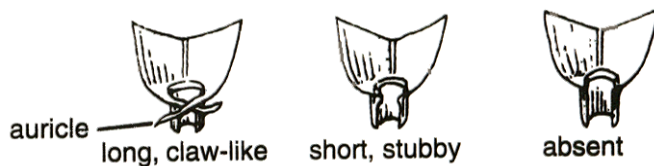


Other features:

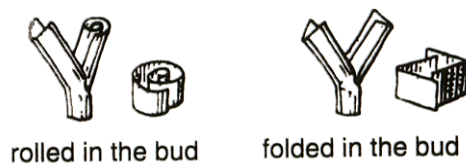
Types of ligules (found in the collar region)



Types of auricles (found in the collar region)

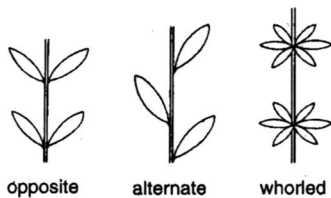
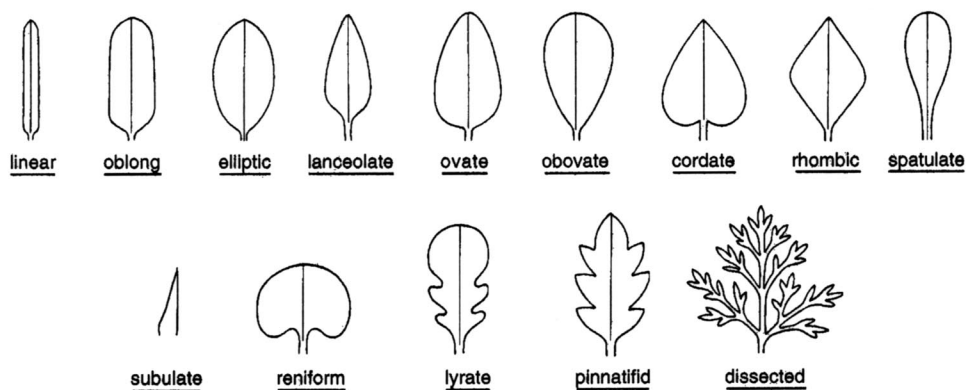
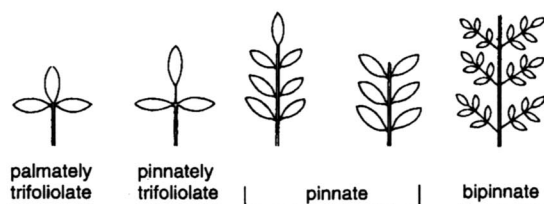
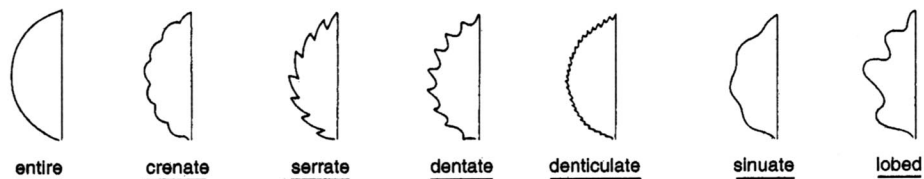
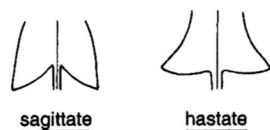


Types of leafbuds



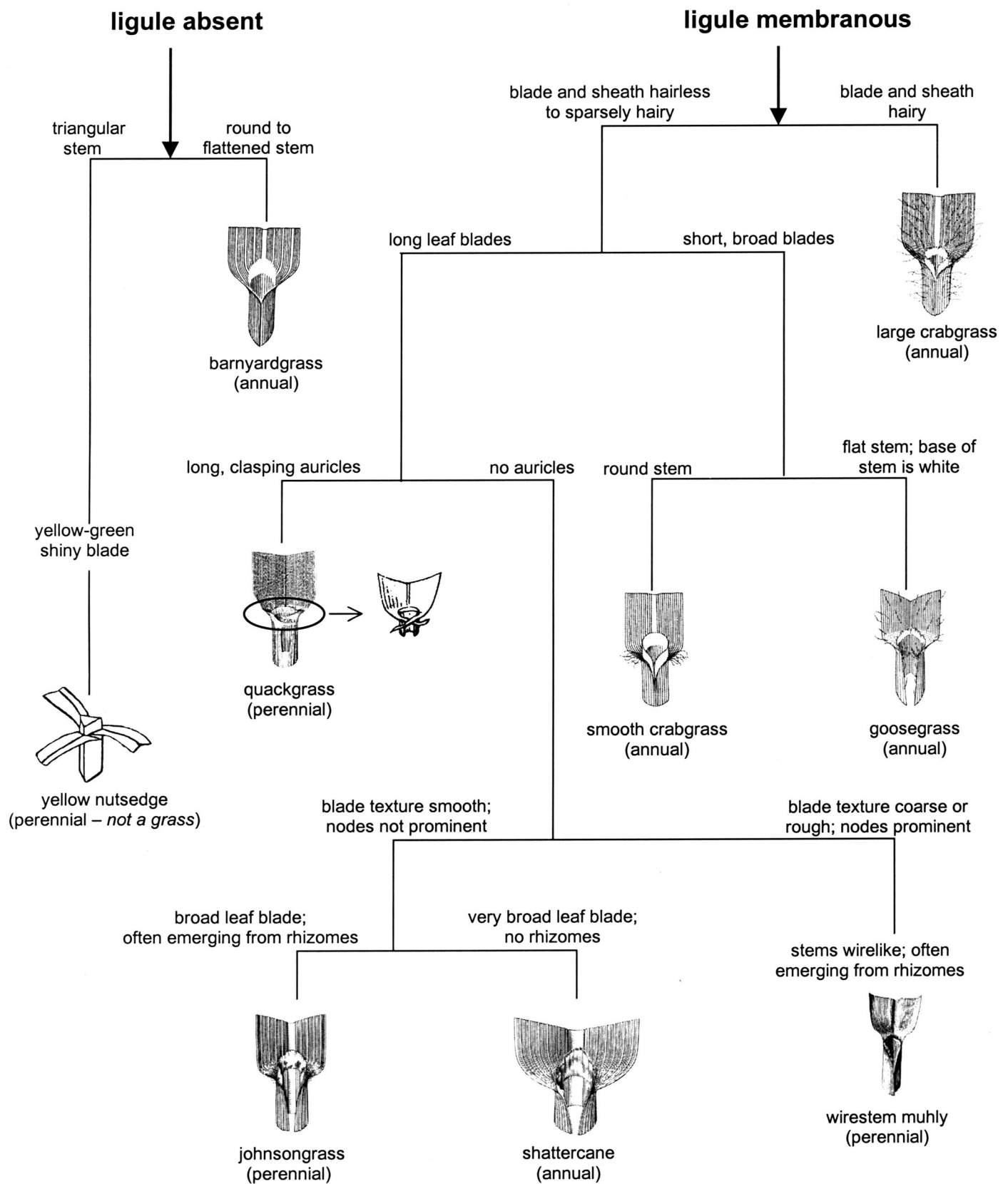
B. Broadleaf Plants: Key Terms

Handout for Activity 1

Leaf arrangement**Leaf shapes****Compound leaves****Leaf margins****Specialized leaf bases**

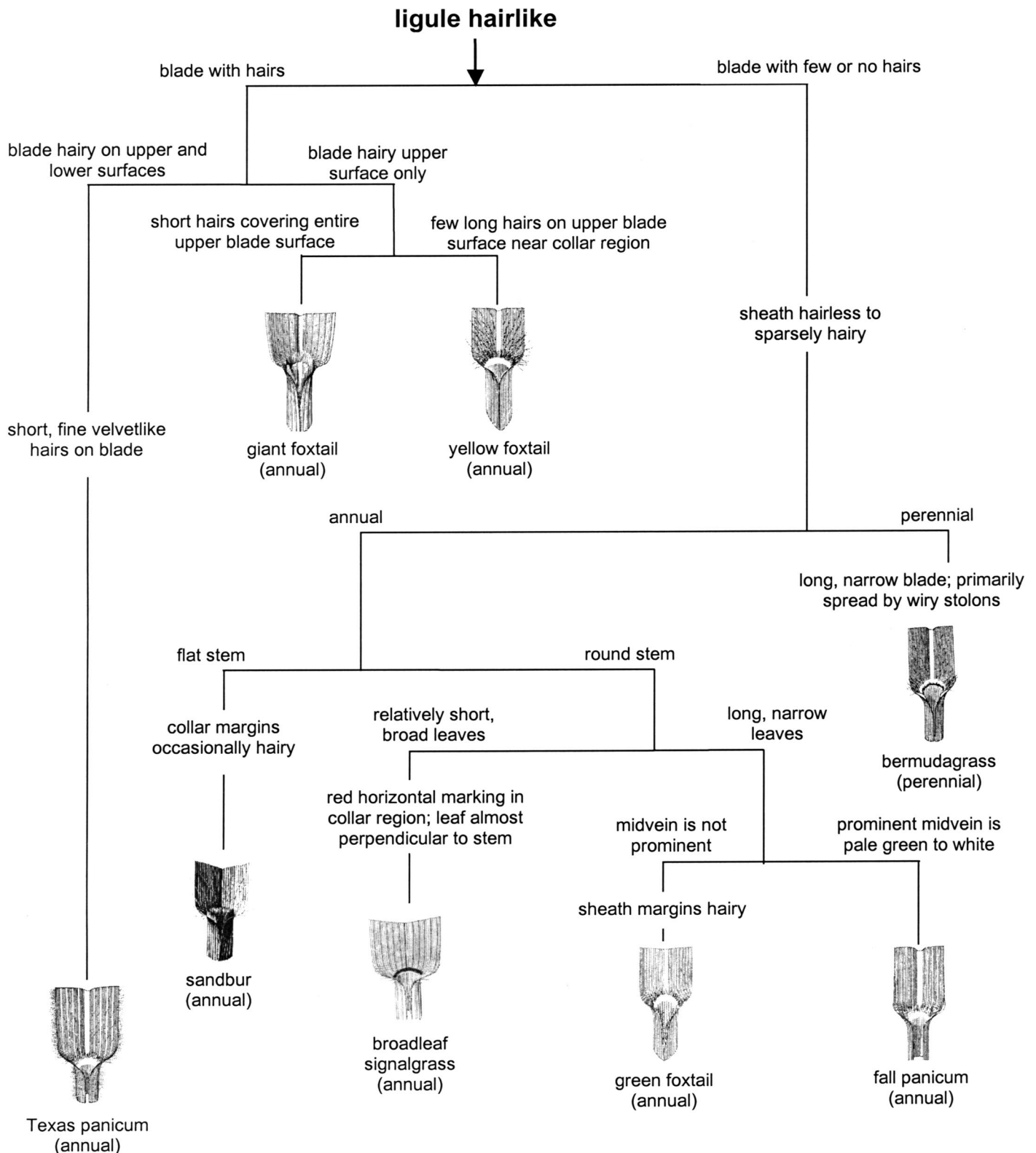
C. Vegetative Key: Seedling Grass and Grasslike Weeds

Handout for Activity 1, p.1



C. Vegetative Key: Seedling Grass and Grasslike Weeds

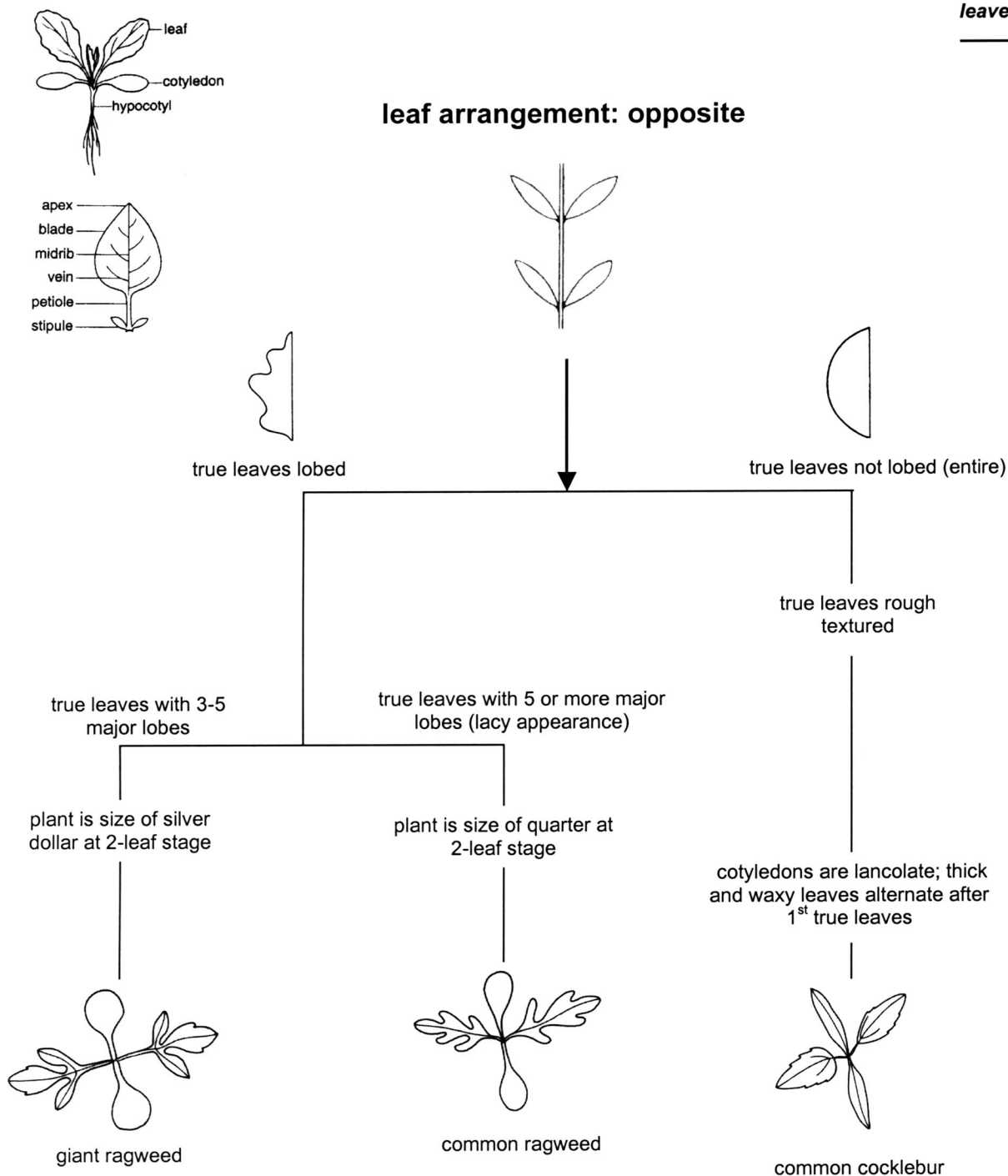
Handout for Activity 1, p.2



Grass drawings provided by Ciba-Geigy Limited, Basel, Switzerland

D. Vegetative Key: Seedling Broadleaf Weeds

Handout for Activity 1, p.1

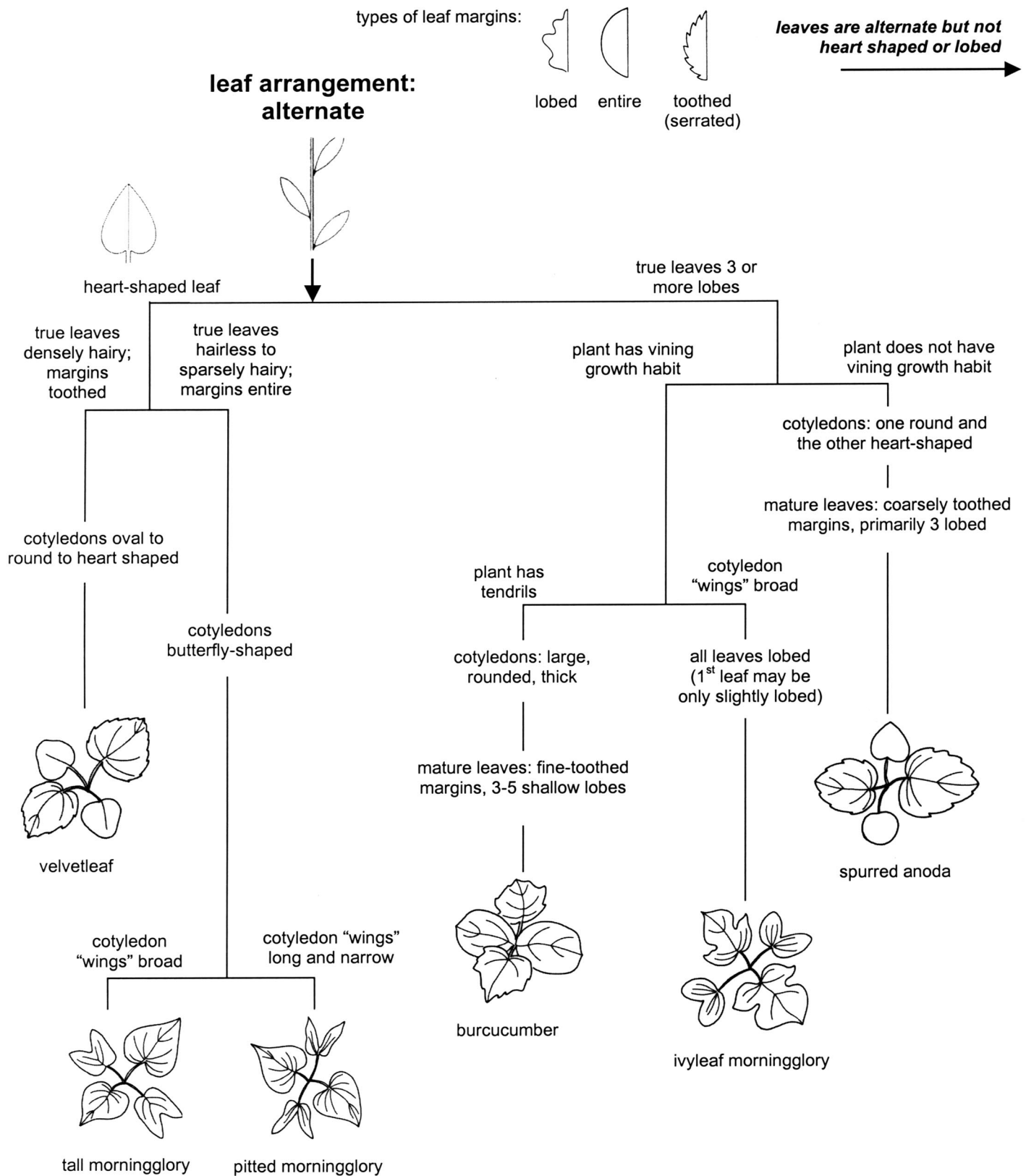


Individual plants drawn by Karen English-Loeb

Drawings of leaf arrangement, margins and shape provided by Ciba-Geigy, Limited, Basil, Switzerland

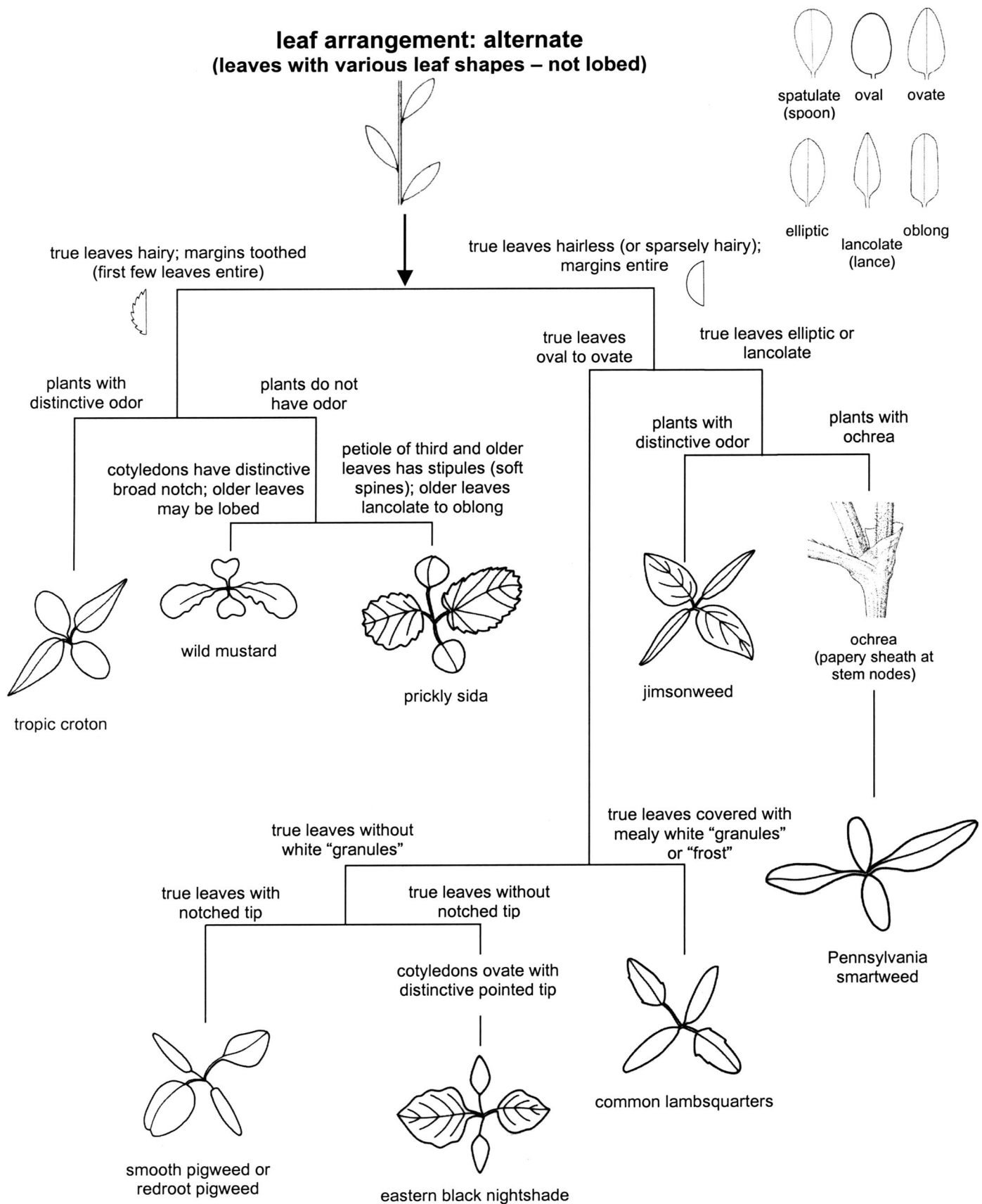
D. Vegetative Key: Seedling Broadleaf Weeds

Handout for Activity 1, p.2



D. Vegetative Key: Seedling Broadleaf Weeds

Handout for Activity 1, p.3



E. Grass and Grasslike Weed Chart

Handout for Activity 1, p.1

Folded leafbud (flat stem)

Ligule	Auricles	Hairs on Blade	Hairs on Sheath	Other Characteristics	Species
Fringe of hairs	None	Sometimes sparsely hairy with long hairs near collar	Fine hairs on margin only	Seedhead is a spiny bur	Sandbur (<i>Cenchrus spp.</i>)
Membranous		None or sparse	None or sparse, margins hairy	Stems whitish at the base; ligule with a small cleft in center	Goosegrass (<i>Eleusine indica</i>)

Rolled leafbud (round stem)

<i>Ligule</i>	<i>Auricles</i>	<i>Hairs on Blade</i>	<i>Hairs on Sheath</i>	<i>Other Characteristics</i>	<i>Species</i>
None	None	None	None or occasional at base	Seedling blades relatively long and narrow; sheath smooth, flattened in older plants	Barnyardgrass (<i>Echinochloa crus-galli</i>)
Fringe of hairs		None	Margins hairy	Sheath may be slightly flattened; blade rough	Green foxtail (<i>Setaria viridis</i>)
		Hairs only on upper side	Margins hairy	Sheath smooth; blade rough above and below; blade hairs about 1 mm	Giant foxtail (<i>Setaria faberi</i>)
		Sparsely hairy on upper surface near base	None	Sheath flattened on older plants; blade hairs about 4 mm	Yellow foxtail (<i>Setaria glauca</i>)
		Only young seedlings are hairy on lower surface	Hairy only on young seedlings	Sheath purplish, smooth, may be slightly flattened; blade with rough margins; seedlings lose hair with age; midrib light green to white and very pronounced	Fall panicum (<i>Panicum dichotomiflorum</i>)
		Seedlings hairless; hairs may develop toward the base in older plants	Seedlings hairless; hairless or hairy in collar regions of older plants	Spreads by wiry stolons / <i>Perennial</i>	Bermudagrass (<i>Cynodon dactylon</i>)



one inch



one centimeter

There are 10 millimeters (mm) in a centimeter.

E. Grass and Grasslike Weed Chart

Handout for Activity 1, p.2

Rolled Leafbud, continued

Ligule	Auricles	Hairs on blade	Hairs on sheath	Other Characteristics	Species
Fringe of hairs and membranous at base	None	None	Margins hairy	Stems bent at nodes; ligule narrow, hairs about 0.8 mm; leaf blade relatively short and wide; often horizontal red markings in collar region	Broadleaf signalgrass (<i>Brachiaria platyphylla</i>)
		Short, soft, fine hairs on both surfaces	Hairy to sparsely hairy	Soft, velvet-like blades, 0.7-2 cm broad; creeping or rooting at lower nodes; ligule hairs 1 to 1.8 mm	Texas panicum (<i>Panicum texanum</i>)
Membranous		None	None	Stems branched, stiff, and wiry; coarse textured; spreads by rhizomes / <i>Perennial</i>	Wirestem muhly (<i>Muhlenbergia schreberi</i>)
		Occasional sparse hairs at base	Occasional sparse hairs at collar region	Often a few long hairs at blade base (collar) only, mostly hairless	Smooth crabgrass (<i>Digitaria ischaemum</i>)
(Can appear fringed at apex)		Hairy on both surfaces	Stiff perpendicular hairs	Tall ligule; long perpendicular hairs; sometimes with rough surface and margins; hairs 0.5-1 cm	Large crabgrass (<i>Digitaria sanguinalis</i>)
(Can appear fringed at apex in older foliage)		None or hairy toward base	None or hairy; often hairy in collar region	Stems robust and purple-spotted; cornlike habit; leaf blades greater than 3 cm wide	Shattercane (<i>Sorghum bicolor</i>)
		None in seedlings; near ligule only in older plants	None	Leaves with prominent white midrib; seedlings with maroon tinge on sheath; leaf blade 1-2 cm wide; large rhizomes / <i>Perennial</i>	Johnsongrass (<i>Sorghum halepense</i>)
Membranous	Long, clasping; undeveloped on seedling	None or sometimes on upper surfaces	None or hairy	Auricles long and prominent; blades somewhat rough; ligule very short, less than 1 mm; spread by sharp-tipped rhizomes / <i>Perennial</i>	Quackgrass (<i>Elytrigia repens</i>)

3 — Angled Leafbud

Ligule	Auricles	Hairs on Blade	Hairs on Sheath	Other Characteristics	Species
None	None	None	None	Not a grass blades are yellow-green, shiny, taper to a point, in groups of 3; primarily spread by tubers / <i>Perennial</i>	Yellow nutsedge (<i>Cyperus esculentus</i>)

 one inch

 one centimeter

There are 10 millimeters (mm) in a centimeter.

F. Broadleaf Weed Chart

Handout for Activity 1, p.1

Deeply-Lobed Leaves					
Cotyledons / Seedling	Leaf Shape	Leaf Surface and Margin	Stem	Other Characteristics	Species
Round to oblong, thick, 2-4 cm long, 1-1.5 cm wide	Leaves are opposite; spreading like fingers from the palm (=palmate) or mostly 3-lobed, 10-20 cm wide, 15 cm long	Leaves are rough, hairy; toothed or serrated margins	Unbranched to frequently branched, rough, hairy, angled, up to 6 ft tall; petioles are long and grooved	Leaves can be 5-lobed, entire or smooth near the top	Giant ragweed (<i>Ambrosia trifida</i>)
Spatulate (spoon-shaped) thick, dark green / <i>occasional purple spots on undersurface and densely hairy young leaves</i>	Leaves are opposite as seedlings, becoming alternate as plant matures; two rows of leaflets along veins, deeply cut (=pinnate); 4-10 cm long	Sparsely hairy to smooth, occasional purple centers and undersurface, margins are deeply cleft and have rounded lobes	Branching; short rough hairs; up to 4 ft tall	Emits strong odor when crushed. Pollen a cause of hay fever	Common ragweed (<i>Ambrosia artemisiifolia</i>)

Alternate-Leaved Plants					
Cotyledons / Seedling	Leaf Shape	Leaf Surface and Margin	Stem	Other Characteristics	Species
	Shallow Lobed or Entire	Densely Hairy to Hairy	Much-Branched, Hairy		
1 rounded and 1 heart-shaped, short hairs / <i>hairy stems</i>	Egg-shaped, 3-lobed, 5-10 cm long	Hairy on both surfaces purplish veins; coarsely toothed, small hairs along margin	Much-branched, stout, densely hairy, up to 3 ft tall, ridged on upper portion	Star-shaped calyx (=outer flower leaflets); lower branches often grow along the ground before growing upward	Spurred anoda (<i>Anoda cristata</i>)
Lance-shaped; thick, fleshy, and waxy, 5 cm long, dark green on top, light green on bottom/ <i>seedlings are purple towards base</i>	Triangular heart-shaped, 3-5 shallow lobes, 5-15 cm long and wide	Rough, hairy, sand-paper texture, 3 prominent main veins; sharp teeth along margins	Much-branched, rough-hairy, green with maroon to black flecks and bumps, ridged, up to 4 ft tall	Distinctive elliptic prickly bur fruit. Seedlings and seeds can cause liver damage in pigs and dogs, intestinal obstruction in all livestock	Common cocklebur (<i>Xanthium strumarium</i>)


 one inch


 one centimeter *There are 10 millimeters (mm) in a centimeter.*

F. Broadleaf Weed Chart

Handout for Activity 1, p.2

Alternate-Leaved Plant, continued

Cotyledons / Seedling	Leaf Shape	Leaf Surface and Margin	Stem	Other Characteristics	Species
	Shallow Lobed or Entire	Densely Hairy to Hairy	Much-Branched, Hairy		
Heart-shaped with small notch at tip; thin / <i>seedlings are densely covered with short hairs, prominent veins beneath young leaves</i>	Oval to lance-shaped, 2-5 cm long, 1-2 cm wide	Softly hairy; serrated margins	Much-branched, softly hairy, small spines (=stipules) at petiole base, up to 1 ft tall	Leaf undersurface may be purplish along the margin; stem may be reddish or purplish at leaf base	Prickly sida (<i>Sida spinosa</i>)
Heart-shaped / <i>first true leaves rounded to oval, distinctly toothed</i>	Oblong to egg-shaped, leaves pattern a pinwheel or whorled appearance at branch endings	Hairy on both surfaces; serrated margins	Much-branched, rough, woody in appearance, densely hairy upper stem	Whitish, saucer-shaped gland on each side of petiole base	Tropic croton (<i>Croton glandulosus</i>)
		Sparsely Hairy to Hairless			
Lance-shaped / <i>dull green upper, bright red lower surface, hairy stems</i>	Egg-shaped to diamond-shaped oval, up to 15 cm long; slight notch at tip of leaf	Hairy beneath to hairless along netted, prominent white veins, dull green above, light green to magenta below	Upper stem is branching, very hairy, lower stem is stout, up to 6 ft tall	Both pigweeds are very competitive with crops	Redroot pigweed (<i>Amaranthus retroflexus</i>) or Smooth pigweed (<i>Amaranthus hybridus</i>)
			Branching, Sparsely Hairy to Hairless		
Lance-shaped, with distinctly pointed tip / <i>smooth, green upper, tinged maroon underneath; stem green with inconspicuous hairs</i>	Triangular-ovate or oval, 2-8 cm long, 1- 5.5 cm wide, leaf tip is blunt (=unnotched)	Nearly hairless, distinctly netted veins, dark green upper; entire or serrated closer to leaf base	Branching, becomes somewhat woody with age, round, angular, hairs absent or few, up to 2 ft tall	Dense foliage, vegetation and fruit can poison all livestock	Eastern black nightshade (<i>Solanum ptycanthum</i>)
Narrowly elliptic, dull green upper, maroon underneath / <i>young stem and leaves coated with mealy white granules</i>	Egg-shaped to lance-shaped, 3-10 cm long	Hairless, mealy grayish- white coating esp. on young leaves and undersurface; margins are irregularly toothed in young to entire in upper leaves	Branched, hairless, ridged, often with maroon stripes, up to 6 ft tall; nearly lacking petioles in upper leaves	Can be very competitive with crops	Common lambsquarter (<i>Chenopodium album</i>)


 one inch


 one centimeter

There are 10 millimeters (mm) in a centimeter.

F. Broadleaf Weed Chart

Handout for Activity 1, p.3

Alternate-Leaved Plants, continued

Cotyledons / Seedling	Leaf Shape	Leaf Surface and Margin	Stem	Other Characteristics	Species
Lance-shaped, thick, smooth 5 cm long, 6 mm wide / <i>purple stem</i>	Oval to egg-shaped, 7-20 cm long, up to 15 cm wide	Inconspicuous hairs, waxy, smooth, dark green upper surface; margins are coarsely and unevenly toothed resembling oak leaves	Branching, inconspicuous hairs, smooth, green and purple, up to 4 ft tall; stout petioles	Foliage has a strong unpleasant odor; 1-2 in long egg-shaped, stiff-spined fruit; entire plant is toxic to livestock	Jimsonweed (<i>Datura stramonium</i>)
Oblong to lance-shaped, smooth / <i>young leaves tinged purple, hairy upper surface</i>	Egg-shaped to lance-shaped, 5-15 cm long, 3 cm wide	Sparsely hairy, smooth, center of both surfaces occasionally marked with purple blotch, smooth or entire margins	Branched, sparsely hairy to hairless, up to 2 ft tall; green or reddish, swollen joint covered at petiole base by a sheath or ochrea	Ochrea: papery sheath at stem nodes	Pennsylvania smartweed (<i>Polygonum pennsylvanicum</i>)

Alternate-Leaved Vining Plants

Cotyledons / Seedling	Leaf Shape	Leaf Surface and Margin	Stem	Other Characteristics	Species
		Densely Hairy to Hairy			
Rounded, thick, roughened by dense short hairs / <i>seedlings have hairy stems</i>	Rounded to heart-shaped, 6-20 cm long, 6-20 cm wide	Sticky-hairy, 3-5 shallow angled lobes; fine-toothed margins	Climbs by branched tendrils, sticky-hairy esp. at leaf base, can exceed 10 ft long	Fruit is covered with long stiff bristles	Burcucumber (<i>Sicyos angulatus</i>)
Butterfly-shaped, deeply notched at tip (= apex) and base	Ivy-shaped, deeply lobed, 5-12 cm long	Very hairy, hairs stand erect	Branched, long climbing or trailing vine, densely hairy, can exceed 10 ft in length	Morningglories are difficult to control and are very competitive, winding around crop stems and foliage	Ivyleaf morningglory (<i>Ipomoea hederacea</i>)
Butterfly-shaped, same as above	Heart-shaped, up to 12 cm long, 10 cm wide	Densely hairy, hairs lie flat, entire margins	Hairy, can exceed 8 ft in length		Tall morningglory (<i>Ipomoea purpurea</i>)
Deeply notched V-shaped, angle of notch wider, lobes more slender and pointed	Heart-shaped, smaller than tall morningglory and tips are tapered, can be as wide as long	Hairless or nearly so; entire margins	Sparsely hairy or hairless; can exceed 10 ft in length		Pitted morningglory (<i>Ipomoea lacunosa</i>)


 one inch


 one centimeter

There are 10 millimeters (mm) in a centimeter.

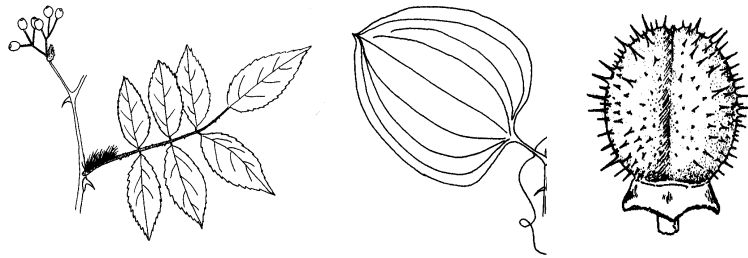
G. Shortcut Identification Tables

Handout for Activity 1, p.1

If a plant you collected doesn't match any of the plants listed in the keys or charts, these short-cut tables could help. Note that they group species by distinctive characteristics (such as having thorns, milky sap, etc.).

The page numbers in these tables refer to *Weeds of the Northeast* by Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso. You may order *Weeds of the Northeast* from Cornell University Press, Sage House, 512 East State Street, Ithaca NY, 14850. Phone: 607 / 277-2338.

Table 1. Weeds with thorns, spines, or sharp prickles



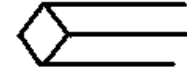
Location of thorns, spines or sharp prickles	Common name	Scientific name	Described on page
On fruit only	longspine sandbur	<i>Cenchrus longispinus</i>	40
	beggarticks	<i>Bidens</i> spp.	122
	common cocklebur	<i>Xanthium strumarium</i>	166
	burcucumber	<i>Sicyo angulatus</i>	218
	wild cucumber	<i>Echinocystis lobata</i>	218
	jimsonweed	<i>Datura stramonium</i>	312
On stem at leaf base only	spiny amaranth	<i>Amaranthus spinosus</i>	96
	spiny cocklebur	<i>Xanthium spinosum</i>	166
	prickly sida	<i>Sida spinosa</i>	262
On leaves, stems, flower heads, and/or fruit	common burdock	<i>Arctium minus</i>	114
	musk thistle	<i>Carduus nutans</i>	124
	Canada thistle	<i>Cirsium arvense</i>	132
	bull thistle	<i>Cirsium vulgare</i>	134
	prickly lettuce	<i>Lactuca serriola</i>	150
	perennial sowthistle	<i>Sonchus arvensis</i>	158
	annual sowthistle	<i>Sonchus oleraceus</i>	160
	spiny sowthistle	<i>Sonchus asper</i>	160, 366
	wild mustard ¹	<i>Brassica kaber</i>	170
	common teasel	<i>Dipsacus fullonum</i>	220
	mile-a-minute	<i>Polygonum perfoliatum</i>	282
	catchweed bedstraw	<i>Galium aparine</i>	302
	horsenettle	<i>Solanum carolinense</i>	316
	greenbriar, catbriar	<i>Smilax</i> spp.	338
	multiflora rose	<i>Rosa multiflora</i>	342
	brambles	<i>Rubus</i> spp.	344
	honey locust	<i>Gleditsia triacanthos</i>	356
	black locust	<i>Robinia pseudoacacia</i>	356

¹ Stiff hairs may be prickly.

G. Shortcut Identification Tables

Handout for Activity 1, p.2

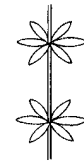
Table 2. Weeds with square stems (or angled or winged so as to appear square)



Common name	Scientific name	Described on page
field horsetail	<i>Equisetum arvense</i>	22
beggarticks	<i>Bidens</i> spp.	122
little starwort	<i>Stellaria graminea</i>	200
common teasel	<i>Dipsacus fullonum</i>	220
ground ivy ¹	<i>Glechoma hederacea</i>	246
henbit ¹	<i>Lamium amplexicaule</i>	248
purple (or red) deadnettle ¹	<i>Lamium purpureum</i>	248
spotted deadnettle ¹	<i>Lamium maculatum</i>	248
healall ¹	<i>Prunella vulgaris</i>	250
creeping thyme ¹	<i>Thymus serpyllum</i>	252
scarlet pimpernel	<i>Anagallis arvensis</i>	290
bedstraws	<i>Galium</i> spp.	302
stinging nettle	<i>Urtica dioica</i>	320

¹In the mint family (Lamiaceae = Labiatae).

Table 3. Weeds with whorled or seemingly whorled leaves



whorled

Leaf arrangement	Common name	Scientific name	Described on page
Whorled leaves	carpetweed	<i>Mollugo verticillata</i>	88
	corn spurry	<i>Spergula arvensis</i>	194
	purple loosestrife ¹	<i>Lythrum salicaria</i>	254
	scarlet pimpernel ²	<i>Anagallis arvensis</i>	290
	bedstraws	<i>Galium</i> spp.	302
Other leaf arrangements that appear to be whorled	field horsetail ³	<i>Equisetum arvense</i>	22
	birdseye pearlwort	<i>Sagina procumbens</i> (opposite)	194
	knawel	<i>Scleranthus annuus</i> (opposite)	196
	leafy spurge	<i>Euphorbia esula</i> (alternate)	224
	cypress spurge	<i>Euphorbia cyparissias</i> (alternate)	224
	toadflaxes	<i>Linaria</i> spp. (alternate)	304

¹ Leaves may be opposite or whorled.

² Leaves opposite or occasionally in whorls of 3

³ Stems are actually whorled; leaves are scale-like structures.

The page numbers in these tables refer to *Weeds of the Northeast* by Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso. You may order *Weeds of the Northeast* from Cornell University Press, Sage House, 512 East State Street, Ithaca NY, 14850. Phone: 607/277-2338.

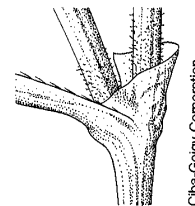
G. Shortcut Identification Tables

Handout for Activity 1, p.3

Table 4. Weeds that exude milky sap from fresh roots, stems, and/or foliage

Common name	Scientific name	Described on page
common milkweed	<i>Asclepias syriaca</i>	102
hemp dogbane	<i>Apocynum cannabinum</i>	102
chicory	<i>Cichorium intybus</i>	130
hawkweeds	<i>Hieracium</i> spp.	148
common catsear	<i>Hypochoeris radicata</i>	148
prickly lettuce	<i>Lactuca serriola</i>	150
sowthistles	<i>Sonchus</i> spp.	158, 160
dandelion	<i>Taraxacum officinale</i>	162
salsifies	<i>Tragopogon</i> spp.	164
common Venus' looking-glass	<i>Triodanis perfoliata</i>	188
small Venus' looking-glass	<i>Triodanis biflora</i>	188
cypress spurge	<i>Euphorbia cyparissias</i>	224
leafy spurge	<i>Euphorbia esula</i>	224
prostrate spurge	<i>Euphorbia humistrata</i>	226
spotted spurge	<i>Euphorbia maculata</i>	226
nodding spurge	<i>Euphorbia nutans</i>	226
Norway maple	<i>Acer platanoides</i>	354
white mulberry	<i>Morus alba</i> (young shoots only)	358

Table 5. Weeds with an ocrea (a papery sheath that encloses the stem at the nodes)



Common name	Scientific name	Described on page
prostrate knotweed	<i>Polygonum aviculare</i>	274
wild buckwheat	<i>Polygonum convolvulus</i>	276
Japanese knotweed	<i>Polygonum cuspidatum</i>	278
Pennsylvania smartweed	<i>Polygonum pensylvanicum</i>	280
ladysthumb	<i>Polygonum persicaria</i>	280
mile-a-minute	<i>Polygonum perfoliatum</i>	282
red sorrel	<i>Rumex acetosella</i>	284
curly dock	<i>Rumex crispus</i>	286
broadleaf dock	<i>Rumex obtusifolius</i>	286

The page numbers in these tables refer to *Weeds of the Northeast* by Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso. You may order *Weeds of the Northeast* from Cornell University Press, Sage House, 512 East State Street, Ithaca NY, 14850. Phone: 607/277-2338.

G. Shortcut Identification Tables

Handout for Activity 1, p.4

Table 6. Weeds with palmately compound or seemingly palmately compound leaves

Leaf arrangement	Common name	Scientific name	Described on page
With 3 leaflets	birdsfoot trefoil	<i>Lotus corniculatus</i>	228
	hop clover	<i>Trifolium aureum</i>	228
	large hop clover	<i>Trifolium campestre</i>	228
	black medic	<i>Medicago lupulina</i>	230
	kudzu	<i>Pueraria lobata</i>	232
	rabbitfoot clover	<i>Trifolium arvense</i>	234
	white clover	<i>Trifolium repens</i>	236
	strawberry clover	<i>Trifolium fragiferum</i>	236
	alsike	<i>Trifolium hybridum</i>	236
	red clover	<i>Trifolium pratense</i>	236
	woodsorrels	<i>Oxalis</i> spp.	266
	buttercups	<i>Ranunculus</i> spp.	294
	wild strawberry	<i>Fragaria virginiana</i>	296
	Indian mock-strawberry	<i>Duchesnea indica</i>	296
	rough cinquefoil	<i>Potentilla norvegica</i>	298
	poison-ivy	<i>Toxicodendron radicans</i>	328
	poison-oak	<i>Toxicodendron toxicarium</i>	328
	virgin's bower	<i>Clematis virginiana</i>	340
	brambles	<i>Rubus</i> spp.	344
	bittersweet nightshade	<i>Solanum dulcamara</i>	348
With 4 or more leaflets	oldfield cinquefoil	<i>Potentilla simplex</i>	298
	common cinquefoil	<i>Potentilla canadensis</i>	298
	silvery cinquefoil	<i>Potentilla argentea</i>	298
	sulfur cinquefoil	<i>Potentilla recta</i>	298
	brambles	<i>Rubus</i> spp.	344
	Virginia-creeper	<i>Parthenocissus quinquefolia</i>	350



palmately trifoliate

Table 7. Weeds with dissected or seemingly dissected leaves

Common name	Scientific name	Described on page
poison-hemlock	<i>Conium maculatum</i>	98
spotted waterhemlock	<i>Cicuta maculata</i>	98
wild carrot	<i>Daucus carota</i>	100
common yarrow	<i>Achillea millefolium</i>	106
common ragweed	<i>Ambrosia artemisiifolia</i>	108
Chamomiles	<i>Anthemis</i> spp.	112
Mugwort	<i>Artemisia vulgaris</i>	116
spotted knapweed	<i>Centaurea maculosa</i>	126
Dogfennel	<i>Eupatorium capillifolium</i>	140
pineapple-weed	<i>Matricaria matricarioides</i>	152
tumble mustard	<i>Sisymbrium altissimum</i>	184



dissected

Reprinted from Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso: *Weeds of the Northeast*. Copyright '1997 by Cornell University. Used by permission of the

publisher, Cornell University Press.

The page numbers in these tables refer to *Weeds of the Northeast* by Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso. You may order *Weeds of the Northeast* from Cornell University Press, Sage House, 512 East State Street, Ithaca NY, 14850. Phone: 607/277-2338.

<http://www.nysaes.cornell.edu/ipmnet/sare.mod/>



Module Feedback

Weed Identification in Row Crops

Tell us a little about yourself:

<i>I m a</i> ♦ Farmer _____ ♦ Crop advisor _____ ♦ Industry rep _____ ♦ Extension educator _____ ♦ Other _____	<i>My commodity area is:</i> ♦ Dairy and field crops _____ ♦ Vegetables _____ ♦ Fruits and berries _____ ♦ Greenhouse and nursery stock _____ ♦ Other _____
---	--

Adapt as needed for your situation.

Let us know what you think:

What part of the workshop was most interesting for you?
What part of the workshop was most valuable to you?
What two new ideas would you like to try on your farm or in your business?
Do you feel you understand IPM—and how to use it—better now?
What other information should be included in this module?
What other topics would you like us to cover in future modules?

Teachers, please fill out an evaluation as well. Photocopy and send all informative evaluations to:

NE-IPM Modules, NYS IPM Program, Box 28 Kennedy Hall, Cornell University, Ithaca NY 14853