

Seedling Images

Report to the Florida Wildflower Seed and Plant Growers Association

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All images were recorded with a Canon SX10 IS digital camera fitted with a Raynox DCR-250 Super Macro Lens (magn. 2.5X).

Characteristics of seedlings in this report are not necessarily unique to that species.

Wildflowers have two cotyledons (and hence are called dicots), even for species that have grass-like foliage. Cotyledons are the "seed leaves", and they function as primary leaves (that is, the first photosynthetic leaves) and/or as storage organs to provide food to the germinating seedling until the first true leaves emerge. Grasses are monocots so they have a single cotyledon. However, the grass cotyledon is not visible in the germinating seedling as the cotyledon serves a digestive function that results in food being provided to the germinating seedling until the first true leaf emerges.

Dicot cotyledons are not always visible. In some species, the cotyledons remain below ground level, which is called hypogeal germination. In many cases, including all the species in this report, the cotyledons are visible as they emerge above the soil to become the first photosynthetic organ of the seedling. This type of germination is termed epigeal.

When trying to identify emerging seedlings, consider the following:

1. Cotyledon shape and size do not necessarily correspond to the seed shape and size; cotyledon shape and size are a reflection of the embryo.
2. Dicots with grass-like foliage have two cotyledons. The first true leaves of such wildflowers may resemble grass seedlings (for example, *Liatris*).
3. Seedlings at the "first true leaf" stage are most easily identified using a 10X to 20X hand magnifier.
4. The first true leaves of many species have sparse to dense hairs; hairs are most easily seen if backlit and/or magnified (Figure 1, page 2).
5. Seedlings tend to be elongated in low light.
6. Sometimes the seed coat may cling to a cotyledon (Figure 1, page 2).
7. Under field conditions, to help determine if wildflowers or grasses have germinated and emerged, sow a small portion of seeds in an identifiable pattern, like an X; however minimize disturbance of the soil so as to reduce the number of weeds that could germinate in that same pattern.

8. The shape and size of dicot cotyledons and first true leaves are useful identification characteristics (Figures 2 and 3, pages 3 and 4, respectively). In this report, a penny is included in most images to provide size perspective.



Figure 1. *Helianthus debilis* seedling – note the hairs (trichomes) on the first true leaves, and the seed coat attached to the cotyledon. Also note that the shape of the seed does not resemble the shape of the cotyledon.

Figures on pages 3 and 4 are from a Texas A&M University extension publication:

Baumann, Paul A. 1999. Weed identification: using plant structures as a key. Texas Agricultural Extension System Publication B-6079. Texas A&M University, College Station, TX.

<http://www.cnr.uidaho.edu/range351/TAMU-Plant-Parts-Guide.pdf>

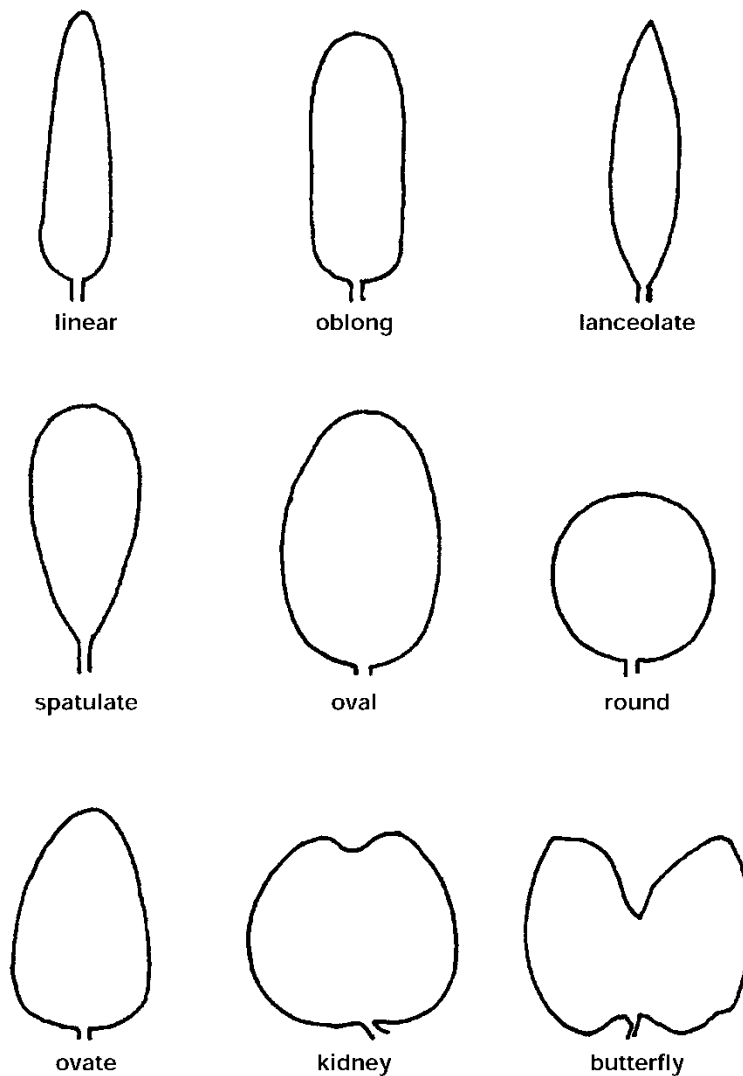


Figure 2. Basic cotyledon shapes, which can aid in identifying seedlings of broadleaf species (Baumann, 1999).

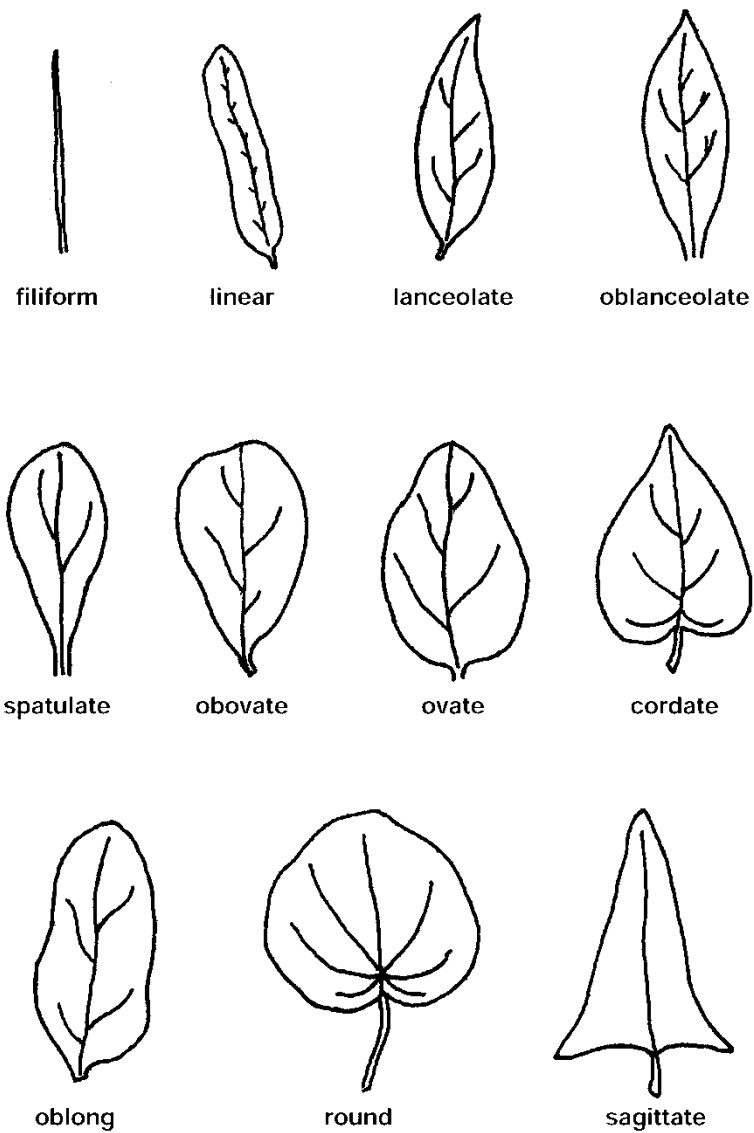


Figure 3. Basic leaf shapes, which can aid in identifying seedlings of broadleaf species (Baumann, 1999).

Species

Latin name	Common name	Page
<i>Ageratina jucunda</i>	Hammock Snakeroot	6
<i>Berlandiera subacaulis</i>	Florida Greeneyes	8
<i>Bidens mitis</i>	Smallfruit Beggarticks	10
<i>Conoclinium coelestinum</i>	Blue Mistflower, Wild Ageratum	12
<i>Coreopsis basalis</i>	Goldenmane Tickseed	13
<i>Coreopsis lanceolata</i>	Lanceleaf Tickseed	15
<i>Coreopsis leavenworthii</i>	Leavenworth's Tickseed	17
<i>Echinacea purpurea</i>	Purple Coneflower	19
<i>Eragrostis elliottii</i>	Elliott's Lovegrass	23
<i>Eragrostis spectabilis</i>	Purple Lovegrass	26
<i>Flaveria linearis</i>	Narrowleaf Yellowtops	29
<i>Gaillardia pulchella</i>	Blanketflower, Indian Blanket	31
<i>Helianthus debilis</i>	Beach Sunflower, East Coast Dune Sunflower	33
<i>Ipomopsis rubra</i>	Spanish Larkspur, Standing Cypress	35
<i>Liatris gracilis</i>	Slender Gayfeather	37
<i>Liatris spicata</i>	Dense Gayfeather	38
<i>Mimosa strigillosa</i>	Powderpuff	40
<i>Phlox drummondii</i>	Annual Phlox, Drummond Phlox	43
<i>Rudbeckia hirta</i>	Black-eyed Susan	45
<i>Rudbeckia mollis</i>	Softhair Coneflower	47
<i>Scutellaria integrifolia</i>	Helmet Skullcap	49
<i>Trifolium reflexum</i>	Buffalo Clover	51
<i>Vernonia angustifolia</i>	Tall Ironweed	54
<i>Vernonia gigantea</i>	Giant Ironweed	55

Ageratina jucunda

Hammock Snakeroot

USDA Symbol: AGJU2

ID Notes:

1. Cotyledons – ovate, with truncate (flattened) apex
2. First true leaves – ovate; leaf margins coarsely serrated; sparsely pubescent (short, fine hairs); petiole sparsely pubescent like leaf



See next page for size perspective



Berlandiera subacaulis

Florida Greeneyes

USDA Symbol: BESU

ID Notes:

1. Cotyledons – oval
2. First true leaf – densely pubescent, as is petiole; pronounced mid-rib vein
3. Second true leaf (see next page) – much larger than first true leaf; pubescent; irregular crenate margin (coarse, rounded teeth)



See next page for size perspective



Bidens mitis

Smallfruit Beggarticks

USDA Symbol: BIM1

ID Notes:

1. Cotyledons – oval
2. First true leaves – one main lobe, plus one to two small lobes; resembles sassafras
3. Hairs on main stem but sparse on petiole (see next page)





***Conoclinium coelestinum* (formerly *Eupatorium coelestinum*)**

Blue Mistflower, Wild Ageratum

USDA Symbol: COCO13

ID Notes:

1. Cotyledons – round
2. First true leaves – ovate; sparsely pubescent (short hairs)
3. Very small seedling



Coreopsis basalis

Goldenmane Tickseed
USDA Symbol: COBA2

ID Notes:

1. Cotyledons – oval
2. First true leaves – ovate; pubescent (coarse hairs), as is petiole
3. Seedlings tend to be light green



See next page for size perspective



Coreopsis lanceolata

Lanceleaf Tickseed

USDA Symbol: COLA5

ID Notes:

1. Cotyledon – spatulate
2. First true leaves – spatulate to broadly lanceolate; sparsely pubescent (coarse hairs)
3. Second set of leaves – spatulate to lanceolate, with long petiole; glabrous, or nearly so





Coreopsis leavenworthii

Leavenworth's Tickseed

USDA Symbol: COLE3

ID Notes:

1. Cotyledons – oval to spatulate
2. First true leaves – obovate; glabrous





Echinacea purpurea

Purple Coneflower

USDA Symbol: ECPU

ID Notes:

1. Cotyledon – round to oval, with truncated apex
2. First true leaves – oblanceolate to ovate; sparsely pubescent but margins more densely pubescent; petiole sparsely pubescent









Eragrostis elliottii

Elliott's Lovegrass

USDA Symbol: EREL

ID Notes:

1. First true leaf – margins rolled slightly inward, especially when first emerging; very fine teeth along margin; during first 1-2 weeks after emergence, usually up to twice as tall as *Eragrostis spectabilis* seedlings







Eragrostis spectabilis

Purple Lovegrass

USDA Symbol: ERSP

ID Notes:

1. First true leaf – margin rolled slightly inward when first emerging; very fine teeth along margin; during first 1-2 weeks after emergence, usually about half as tall as *Eragrostis elliottii* seedlings







Flaveria linearis

Narrowleaf Yellowtops

USDA Symbol: FLLI

ID Notes:

1. Cotyledons – oval to round
2. First true leaves – linear and bluntly tipped when small; gradually becoming more lanceolate; glabrous





Gaillardia pulchella

Blanketflower, Indian Blanket

USDA Symbol: GAPU

ID Notes:

1. Cotyledons – oval to spatulate
2. First true leaves – lanceolate; moderately to densely pubescent (long, soft hairs), including petiole





Helianthus debilis

Beach Sunflower, East Coast Dune Sunflower
USDA Symbol: HEDE4

ID Notes:

1. Cotyledons – round, and often kidney shaped (round with shallow notch)
2. First true leaves – lanceolate to oblong to ovate; moderately pubescent (coarse hairs)





Ipomopsis rubra

Spanish Larkspur, Standing Cypress

USDA Symbol: IPRU2

ID Notes:

1. Cotyledons – linear, very small; might be able to distinguish these seedlings at this stage
2. First true leaves – 2-3 pointed, finger-like lobes; one lobe much larger; if 3 lobes, center lobe the largest; petioles sparsely pubescent (coarse hairs)





Liatris gracilis

Slender Gayfeather

USDA Symbol: LIGR9

ID Notes:

1. Cotyledons – spatulate, with truncated apex; glossy
2. First true leaf – narrowly linear (grass-like) and noticeably revolute (margins curled downward) when first emerging; prominent midvein; blunt tip; glabrous



Liatris spicata

Dense Gayfeather

USDA Symbol: LISP

ID Notes:

1. Cotyledons – spatulate, with truncated apex; glossy; slightly larger than those of *L. gracilis*
2. First true leaf – narrowly linear (grass-like) and noticeably revolute (margins curled downward) when first emerging; prominent midvein; blunt tip; glabrous





Mimosa strigillosa

Powderpuff

USDA Symbol: MIST2

ID Notes:

1. Cotyledons – oval
2. First true leaves – newly emerging leaf is perpendicular to petiole; pinnately compound; 8 to 10 leaflets; leaflets broadly obovate and nonsymmetrical; main vein ends in pointed tip
3. Scarified seeds might germinate in less than 2 days







Phlox drummondii

Annual Phlox, Drummond Phlox

USDA Symbol: PHDR

ID Notes:

1. Cotyledons – broadly lanceolate
2. First true leaves – linear, with short, spine-like tip, becoming lanceolate to oblanceolate; sparsely pubescent, as are petioles





Rudbeckia hirta

Black-eyed Susan

USDA Symbol: RUHI2

ID Notes:

1. Cotyledons – oval to round, with truncated apex
2. First true leaves – ovate to oblanceolate to spatulate; moderately pubescent (coarse hairs) as are petioles





Rudbeckia mollis

Softhair Coneflower

USDA Symbol: RUMO

ID Notes:

1. Cotyledons – round; frequently kidney shaped
2. First true leaves – round to broadly ovate; densely pubescent (soft hairs) as are petioles



***NOTE: Image was edited to highlight pubescence. The image on p. 48 accurately depicts seedling color.**



Scutellaria integrifolia

Helmet Skullcap

USDA Symbol: SCIN2

ID Notes:

1. Cotyledons – round to kidney shaped; moderately pubescent (short hairs)
2. First true leaves – oblong; moderately pubescent (short hairs), as are petioles; margins slightly serrated
3. Subsequent leaves – moderately pubescent (short hairs), as are petioles; margins crenate (shallow, rounded teeth) – see next page





Trifolium reflexum

Buffalo Clover

USDA Symbol: TRRE2

ID Notes:

1. Cotyledons – broadly oblong to oval
2. First true leaf – round, with notched tip (like a kidney shaped cotyledon – Figure 2, page 3); margin ciliate (fine hairs)
3. Second true leaf – trifoliate, with reverse cordate leaflets (leaflets attached at point of heart); margins ciliate







Vernonia angustifolia

Tall Ironweed

USDA Symbol: VEAN

ID Notes:

1. Cotyledons – broadly oblong, with shallowly-notched truncate apex
2. First true leaves – ovate; moderately pubescent dense (short, fine hairs)



Vernonia gigantea

Giant Ironweed

USDA Symbol: VEGI

ID Notes:

1. Cotyledons – round, with truncate apex
2. First true leaves – "ovate" but lower half can be more angular than gently curved as in typical ovate shaped leaf; moderately pubescent (short, fine hairs)

