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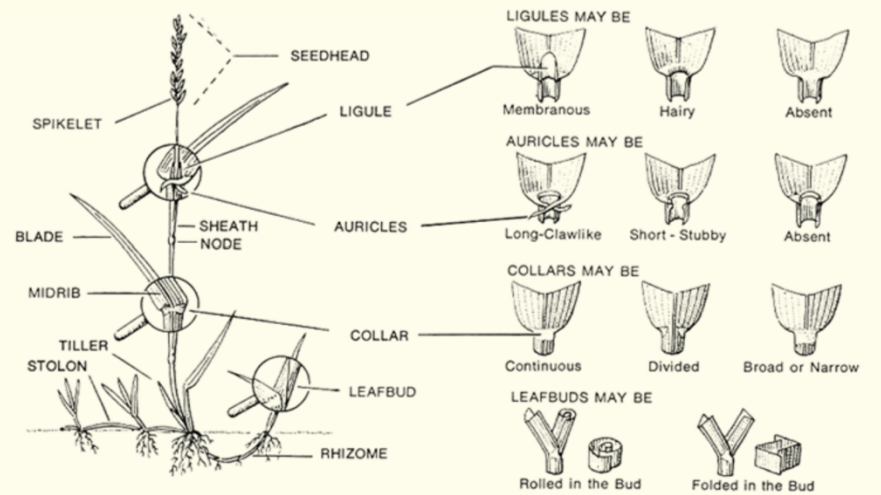
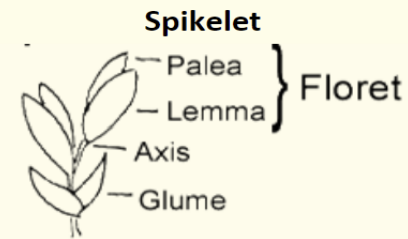
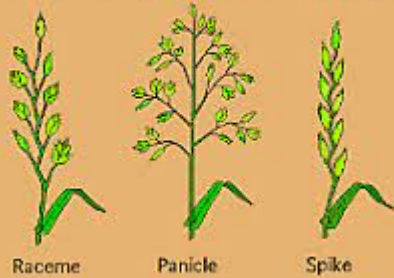
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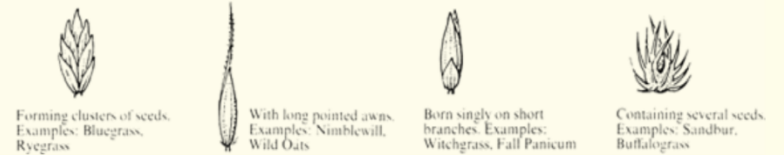
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# Grass anatomy

## Grass Inflorescences



## Examples of spikelets



**Roemer's fescue (*Festuca roemerii*) (native)**

About this plant: cool season perennial bunchgrass, stiff, erect stems can grow 14-45 inches tall, often blue-green, can be yellow/ green to red/purple as it matures, establishes on moderately dry to moist prairies, savannas, meadows, and grassy openings within woods, not to be confused with red fescue (*Festuca rubra*)

**Identification Tips**

Sheath: closed for less than half their length

Collar: glabrous (not hairy)

Blade: 5-35 cm

Ligule: less than 0.5 mm

Seed head: open panicle and long lemmas

Flowering period: May-June

Other: densely clumped with visible nodes, found in dry open places, most likely palatable forage material



**Tall fescue (*Schedonorus arundinaceus*) (non-native)**

About this plant: strongly tufted annual w/ short rhizomes, mostly glabrous (not hairy) with exception of the auricle, rows tall up to 40 inches tall, found in meadowlands, fallow fields and ditch banks.

**Identification Tips**

Sheath: open

Auricle: prominent and hairy

Collar: glabrous (not hairy)

Blade: flat and stiff 4-10 mm

Ligule: .02 mm

Seed head: narrow panicle, 15-35 cm long

Flowering period: May-July

Other: well-suited for use as a stockpile forage because it retains its quality, very palatable when young



**Tall oat grass (*Arrhenatherum elatius*) (non-native)**

About this plant: tall perennial, loosely tufted cool season grass, sometimes rhizomatous but usually erect with bulbous base, grows 30-60 inches tall, found in meadow and pastures

**Identification Tips**

Sheath: open and smooth

Blade: up to 12 inches long and 2-12 mm wide, rough to the touch

Auricle: not present

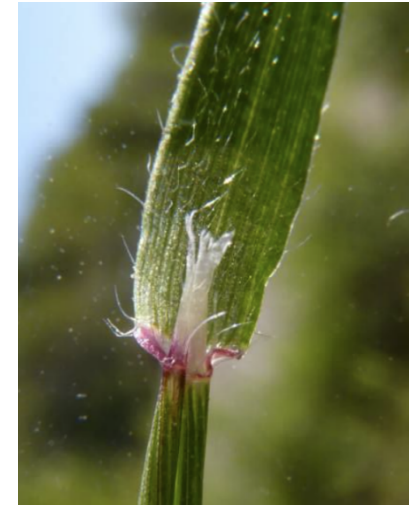
Collar: glabrous (not hairy)

Ligule: 1-2mm, truncate (squared off at top)

Seed head: narrow panicles 3-10 inches long with strongly bent awns

Flowering period: June-September

Other: adapted to excessively drained low fertility soils



**Sweet vernal grass (*Anthoxanthum odoratum*) (non-native)**

About this plant: tufted perennial, culms hollow and erect, 3-11 inches tall, found on roadsides, fields, meadows, balds, lawns and other disturbed locations at low elevations.

**Identification Tips**

Sheath: open

Auricle: well-developed

Collar: distinct red collar

Blade: flat

Ligule: 2-3 mm

Seed head: spike with brown/golden brown color

Flowering period: April-July

Other: drought tolerant, roots and crushed foliage often producing a fresh hay fragrance with hint of vanilla



**Timothy Grass (*Phleum pratense*) (non-native)**

About this plant: rhizomatous or growing in tufts, grows up to 36 inches tall, found in disturbed areas including roadsides and fields

**Identification Tips**

Sheath: open

Collar: glabrous (not hairy)

Blade: flat

Ligule: apex of ligule squared off, 2-3 mm long

Seed head: one spike with awns 1-1.5 mm. A cylindrical panicle 5-10 cm long

Flowering period: May-July

Other: bulbous at base, generally swollen



**Field meadow-foxtail (*Alopecurus pratensis*) (non-native)**

About this plant: stout tufted herbaceous perennial, grows up to 11-35 inches tall, found in swampy areas in meadows, irrigated fields and roadsides

**Identification Tips**

Sheath: open and smooth

Collar: fringe of fine hairs

Blade: 3-10 mm wide, rough on lower surface

Ligule: 1.5-3 mm

Seed head: spike-like panicle, 2-13 cm long and 0.5-1 cm wide with silvery-green to purplish spikelets.

Flowering period: June-July

Other: widely used for forage and pasture, looks similar to Timothy grass, note bent awn above lemma and panicle that tapers on both ends



**Soft chess (*Bromus hordaeaceus*) (non-native)**

About this plant: cool season annual grass, 4-25 inches tall, found on roadsides and dry hillsides

**Identification Tips**

Sheath: closed

Auricle: absent

Collar: hairy

Blade: flat 1.5-4 mm, broad

Ligule: 0.5-1 mm, hairy

Seed head: panicle w/ compact spikelets form dense flowering heads with needlelike awns

Flowering period: May-July

Other: nutritious and palatable forage



**Ripgut brome (*Bromus diandrus*) (non-native)**

About this plant: cool season annual grass, 6-23 inches tall, found in open disturbed sites, roadsides, fields, rangelands, orchards, agronomic crops fields

**Identification Tips**

Sheath: glabrous or hairy

Collar: hairy

Blade: 2-7mm wide, hairy

Ligule: 1-3 mm

Seed head: panicle with large spikelets and needlelike awns, 2.5–5 cm long, distinguishes ripgut brome from the much shorter awns of soft brome

Flowering period: April-June

Other: poor forage quality, livestock may be injured if they consume the sharp, long-awned florets



**Kentucky bluegrass (*Poa pratensis*) (non-native)**

About this plant: strongly rhizomatous perennial, 15-40 in tall, found in moist disturbed areas

**Identification Tips**

Sheath: closed halfway

Collar: may have fine hair on edge

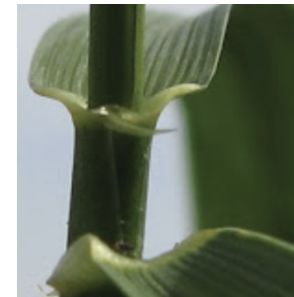
Blade: flat, forms boat shape tip.

Ligule: 1-1.5 mm, truncate (squared top), to rounded

Seed head: conical panicle, oval spikelets are 3-6 mm long

Flowering period: April-October

Other: important forage for sheep and cattle



**Creeping wildrye/quack grass (*Elymus repens*) (non-native)**

About this plant: strong perennial with wiry rhizomes, up to 4 feet tall, found in open, disturbed areas.

**Identification Tips**

Sheath: open

Auricle: well-developed and clasping

Collar: sheaths are often strongly hairy on lower leaves, upper leaves smooth or slightly soft-hairy

Blade: flat and usually hairy

Ligule: under 0.5mm long

Seed head: awn present or not. If so usually 10 mm long.

Flowering period: June-Aug

Other: erect culms (stalk)

**Velvet grass (*Holcus lanatus*) (non-native)**

About this plant: tufted perennial, 12-39 inches tall, found in balds, meadows, lawns, and prairies

**Identification Tips**

Sheath: open

Collar: hairy

Blade: flat, 8-10 mm broad w/ marginal hairs

Ligule: 1-2 mm long with fringe hairs on top,

Seed head: dense, compact panicle, spikelets generally 2-flowered

Flowering period: May-July

Other: very soft (like velvet)



**Colonial bentgrass (*Agrostis capillaris*) (non-native)**

About this plant: cool season grass, has stolons or rhizomes, grows 4-24 inches tall, found on roadsides and open, disturbed places

**Identification Tips**

Sheath: open

Collar: glabrous (not hairy)

Blade: lower blades generally flat

Ligule: apex of ligule squared off, generally wider than long at 0.5-2 mm

Seed head: open panicle, glumes 2-3 mm, (callus) not hairy or minutely hairy, short awns near tip.

Flowering period: July-September

Other: auricle absent, good for forage and turf





**Orchard grass (*Dactylis glomerata*) (non-native)**

About this plant: cool season bunchgrass, up to 47 inches tall, common forage plant found in meadows, fields, roadsides, and forest edges

**Identification Tips**

Sheath: closed

Collar: glabrous

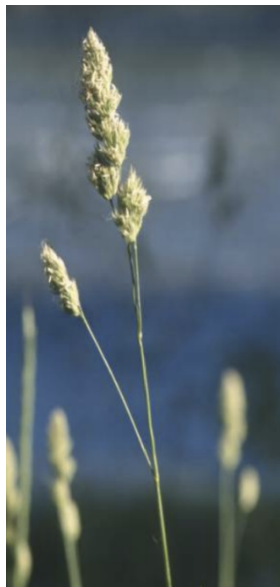
Blade: flat, 3-11 mm broad

Ligule: 3-9 mm, usually upper part turned back and torn up

Seed head: panicle, awn 1mm long.

Flowering period: June-Aug

Other: base is compressed, (feels flat)



**English rye grass (*Lolium perenne*) (non-native)**

About this plant: tufted perennial up to 12-32 inches tall, found in old fields, roadsides.

**Identification Tips**

Sheath: open

Auricle: developed on most

Collar: glabrous (not hairy)

Blade: 3-4 mm broad, flat to folded

Ligule: entire, 0.5-1.5 mm long

Seed head: single terminal spike

Other: commonly cultivated as forage plant



**Rat-tail fescue (*Vulpia myuros*) (non-native)**

About this plant: cool season annual grass, grows 12-15 inches tall, found in balds, open areas, grasslands, and roadsides

**Identification Tips**

Sheath: open

Collar: glabrous (not hairy)

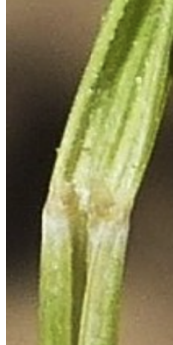
Blade: 1mm broad, usually folded

Ligule: small, 0.2-0.6mm long

Seed head: slender panicle up to 8 inches

Flowering period: April-June

Other: no auricle, light green color stands out in fields in early spring, senesced grass forms dense mats. Poor forage due to sharp awns



**California oatgrass (*Danthonia californica*) (native)**

About this plant: tufted perennial, grows 12-24 inches tall, found in grassy meadows, prairies, and mid-elevation mountains

**Identification Tips**

Sheath: open

Collar: long hairs at throat

Blade: flat or slightly involute

Ligule: 1-2 mm, fringe of hairs (not membranous)

Seed head: small open panicle at least 1 cm long with marginal hairs

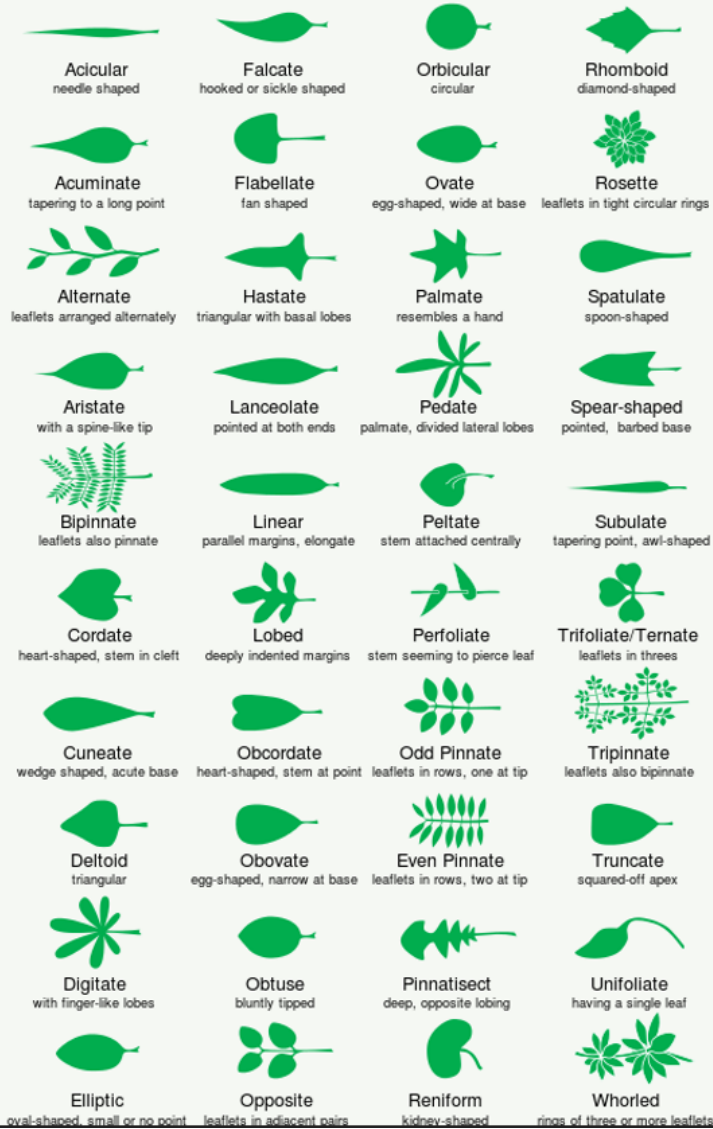
Flowering period: June to July

Other: often found with ponderosa pines. very nutritious forage material

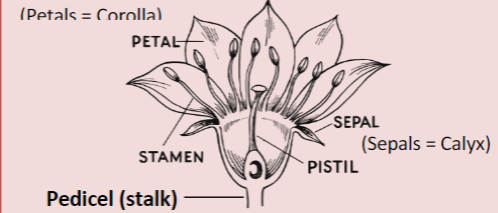


# Floral anatomy

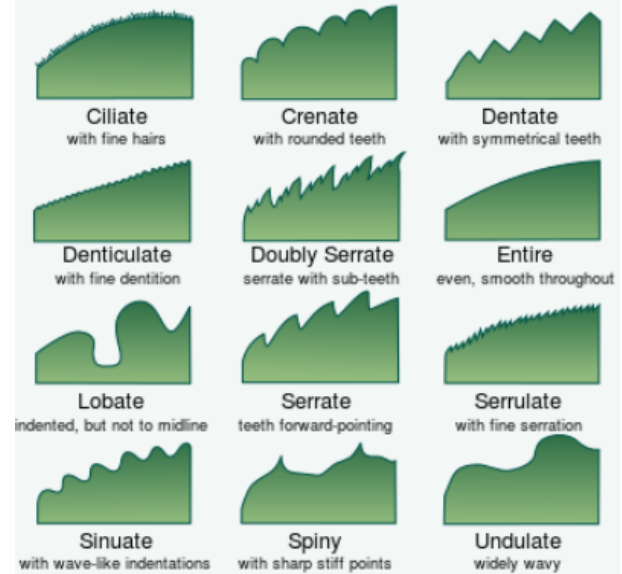
## SHAPE & ARRANGEMENT



## Flower Parts



## MARGIN



## Leaf Arrangement



**Common camas (*Camassia quamash*) (native)**

About this plant: perennial, 7-27 inches tall, grows from a bulb, likes moist meadows, prairies, and hillsides, formerly in the lily family

**Identification Tips**

Leaf: all originate from the base of the plant (basal), grass-like but broader, up to 19 inches long, considerably shorter than flower stalk when present

Flower: pale to dark blue, 6 petals, 6 stamen, 3 stigma.

Other: flowering period from April-June, flower stalk grows from the base of the plant, is leafless, and has 5 or more flowers growing from the top



**Western buttercup (*Ranunculus occidentalis*) (native)**

About this plant: hairy, perennial, branched stems 6-16 inches tall, likes well-drained and moist soil

**Identification Tips**

Leaf: 2 types - basal and stem leaves; basal leaves on long stalks with 3 coarsely-toothed lobes, stem leaves arranged alternately with shorter stalks and become smaller and more deeply divided (narrower lobes) up the stem

Flower: yellow, 5 petals, 30-60 stamens, 10-20 pistils, 5 greenish hairy sepals that bend back towards flower stalk

Other: flowering period from April-June

**Spring gold (*Lomatium utriculatum*) (native)**

About this plant: perennial, 4-23 inches tall, likes drier open meadows, part of the carrot family

**Identification Tips**

Leaf: lacy and heavily segmented, leaf stalks sheath around each other at the base of the plant

Flower: several compact, egg-shaped flower heads in the shape of an umbrella

Other: flowering period April-June



**Bull thistle (*Cirsium vulgare*) (non-native)**

About this plant: biennial - first year forms a rosette, second year grows a branching 2-6 foot tall flower stalk, typically prefers sunny and open areas, only reproduces via seed so effective control involves prevention of seed set and spread

**Identification Tips**

Leaf: rosette can grow to be 3 feet across - basal leaves are deeply lobed with sharp spines on the midrib and tips of the lobes; stem leaves are deeply lobed, hairy on top and bottom, have sharp spines on the end of the lobes, leaves extend down stem to form spiny "wings"

Flower: single flowerheads on top of each stem; green, spiny, "gumdrop" shaped base topped with fluffy purple-pink petals

Other: Flowering period from June- September, goats and sheep will eat this plant, but cattle tend to avoid it

**Creeping/Canada thistle (*Cirsium arvense*) (non-native)**

About this plant: perennial, can grow up to 5 feet tall, spreads via seed and a creeping root system that sends up new shoots, new plants can spread by broken off root fragments, often grows in dense clumps, prefers open and sunny areas

**Identification Tips**

Leaf: stalkless, oppositely arranged, up to 6 inches long, deeply lobed with wavy edges, spines at the tip of each lobe, smooth top of leaf but may have some hairs on the bottom, leaves get more narrow as they move up the stem

Flower: clusters of up to 5 flowers at the top of each stem, green and purple non-spiked “gumdrop” shaped base with purple-pink fluffy petals on top

Other: seeds have long white hairs attached to them to help with wind dispersal



**Sulfur cinquefoil (*Potentilla recta*) (non-native)**

About this plant: up to 3 feet tall, **hairs on stems and leaves lie flat** (native look-alike *Potentilla gracilis* has hairs that stick straight out) upright stems with some branching near the top, several stems per plant, spread via seed and new shoots from root crown.

**Identification Tips**

Leaf: 5-7 serrated leaflets, palmate, green underside

Flower: pale yellow, 5 heart-shaped petals

Other: livestock will often avoid eating this plant due to a high tannin content, flowering period May-July, control by mowing is not effective (stimulates new sprouts from root crown and can spread seeds) - for small populations dig out the woody root.

**Slender cinquefoil (*Potentilla gracilis*) (native)**

About this plant: perennial, 1-2 feet tall, **hairs on stems and leaves stick straight out** (non-native look-alike *Potentilla recta* has hairs that lie flat), multiple stems grow out of a clump of basal leaves

**Identification Tips**

Leaf: 5-7 serrated leaflets, palmate, lighter (silver-white) underside

Flower: bright yellow, 5 heart-shaped petals

Other: flowering period June-July



**Little hop clover (*Trifolium dubium*) (non-native)**

About this plant: small annual, grows in a branching manner found upright or creeping, stems usually hairy and reddish in color, likes open areas with full sun, grows in disturbed areas like roadsides and pastures

**Identification Tips**

Leaf: 3 small leaflets (trifoliate) that are obovate in shape, prominent veins, alternately arranged along the stem

Flower: bright yellow, pea sized, spherical flowerhead of tiny petals, forms clumps of 3-15 flowers

Other: flowering period April-July, can be livestock forage

**Red clover (*Trifolium pratense*) (non-native)**

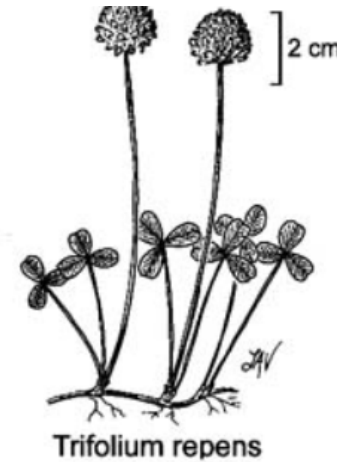
About this plant: biennial to short-lived perennial, 0.5-2 feet tall, hairy stems, new shoots grow upright from root crown, can grow in open fields to forest edges as it tolerates shade better than most clovers.

**Identification Tips**

Leaf: 3 leaflets (trifoliate) up to 2 inches long, ovate to obovate in shape, light-green to white v-shaped chevron stripe on each leaflet, leaves usually hairy on both upper and lower surfaces

Flower: pink, spherical flowerhead about an inch across

Other: flowers have a mild honey smell, flowering period-June-October, introduced as an agricultural forage species



**White clover (*Trifolium repens*) (non-native)**

About this plant: perennial, up to 1 foot tall, primarily spread by runners that form shallow roots at the nodes, smooth stems grow horizontally near the soil to create a mat.

**Identification Tips**

Leaf: 3 leaflets (trifoliate) that are ovate in shape, edge of leaf is serrulate (finely toothed/ serrated), white crescent or v-shaped chevron stripe on each leaflet

Flower: white, spherical flowerhead about an inch across



**Subterranean clover (*Trifolium subterraneum*) (non-native)**

About this plant: annual, up to 6 inches tall, stems grow along the ground as runners that don't root at the nodes.

**Identification Tips**

Leaf: 3 leaflets (trifoliate), alternately arranged, hairy on both upper and lower surfaces, often have purple-black stripes/ speckles along the midvein of leaflets

Flower: flower head is composed of 3-4 white florets, **significantly smaller** than the spherical flower heads of other clovers

Other: flowering period March-April, called "subterranean clover" because it buries its seed pods before the onset of summer heat/ drought; used for erosion control, grazing material, and weed suppression



**Sheep sorrel (*Rumex acetosella*) (non-native)**

About this plant: perennial, basal rosette of leaves with flowering stalk that can reach 18 inches tall, likes partial or full sun and well-draining soil, commonly spreads via rhizomes and will often form clumps

**Identification Tips**

Leaf: arrow-shaped (lanceolate) with two lobes at the base (sometimes looks like a goldfish), 1-3 inches long, alternately arranged

Flower: no petals, 6 sepals, red (female) flowers have a single white pistil, yellow-green (male) flowers have 6 stamens; branching flower stalks are angular or ridged

Other: flowering period March-November, edible in small amounts - leaves have a lemony or tart flavor

**Hairy cat's ear (*Hypochaeris radicata*) (non-native)**

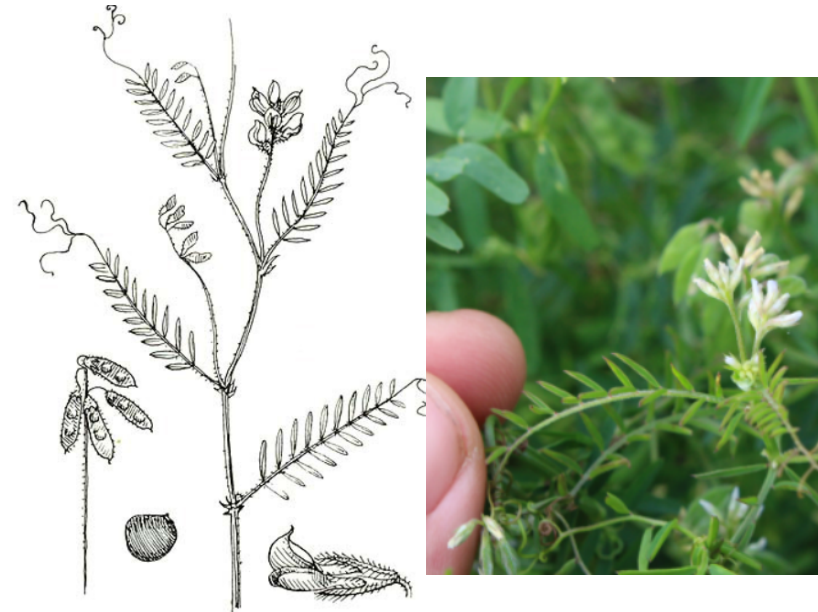
About this plant: perennial, clump of basal leaves form from a woody base, hollow flower stems exude milky white sap when broken

**Identification Tips**

Leaf: very hairy and rough, deeply lobed with wavy edges (margin), generally 1-6 inches long

Flower: yellow, 20-30 narrow petals, branching flower stalks often mistaken for dandelions

Other: flowering period April-July, seeds are similar to dandelions - tufts of white hairs help with wind dispersal



*Vicia hirsuta*

**Tiny vetch/ hairy vetch (*Vicia hirsuta*) (non-native)**

About this plant: annual, stems grow to about 2.5 feet, hairy stems, tendrils at the tips of leaves aid in climbing, prefers to grow in open fields

**Identification Tips**

Leaf: even pinnately compound, 4-16 leaflets that end in a forked tendril, leaves arranged alternately around the stem

Flower: whitish-blue, small (1/8 inch), pea-shaped, form in groups of 2-6

Other: seeds form inside flat, hairy pea pods that are about a half inch long; each pod contains 2 seeds.

**Common vetch (*Vicia sativa*) (non-native)**

About this plant: annual, 1-3 feet tall, stems are angled and branched, tendrils at the tips of leaves aid in climbing, prefers to grow in open fields, favorable forage for livestock.

**Identification Tips**

Leaf: even pinnately compound, 8-16 leaflets that end in a forked tendril, leaves arranged alternately around stem

Flower: pink to purple, up to 1 inch long, pea-shaped, single or pair of flowers

Other: seeds form in a flattened peapod up to 2 inches long, 4-12 seeds per pod



**Ox-eye daisy (*Leucanthemum vulgare*) (non-native)**

About this plant: perennial, 1-3 feet tall flower stalks arise from a clump of basal leaves, flower stalks grooved and sometimes branched, creeping rhizomes often form large colonies.

**Identification Tips**

Leaf: deep green and hairless, basal and low stem leaves up to 5 inches long, spoon-shaped (spatulate) with deep and narrow lobes; smaller leaves higher on the flower stalk

Flower: white, 20-30 slightly notched petals around a yellow center, 1-2 inches across

Other: flowering period June-August, not palatable - livestock will avoid it

**Tansy ragwort (*Senecio jacobaea*) (non-native)**

About this plant: biennial, first year forms basal rosette of ruffled leaves, second year sends up several flower stalks 1-3 feet tall, favors pastures and other disturbed areas

**Identification Tips**

Leaf: dark green upper leaf surface, light green lower surface, deep toothed lobes, wrinkly or ruffled appearance (look like kale)

Flower: yellow, 13 petals surround a yellow-orange center, form in clusters, daisy-like

Other: **toxic to livestock** if consumed, flowering period June-September



**English plantain (*Plantago lanceolata*) (non-native)**

About this plant: perennial, forms basal clumps of long, ribbed leaves, grows in grasslands and open or disturbed areas, spreads via seed.

**Identification Tips**

Leaf: basal, 4-16in long, linear shape with prominent parallel veins (ribs) along the length of the leaf

Flower: cylindrical flower spike 0.5-3 inches long at the end of a long, fuzzy stalk; flowers open in a ring around the spike (starting at the bottom) sending out white stamens

Other: important host plant for Taylor's Checkerspot butterfly larvae