



LESSON FIVE:

Rangeland Plant Identification



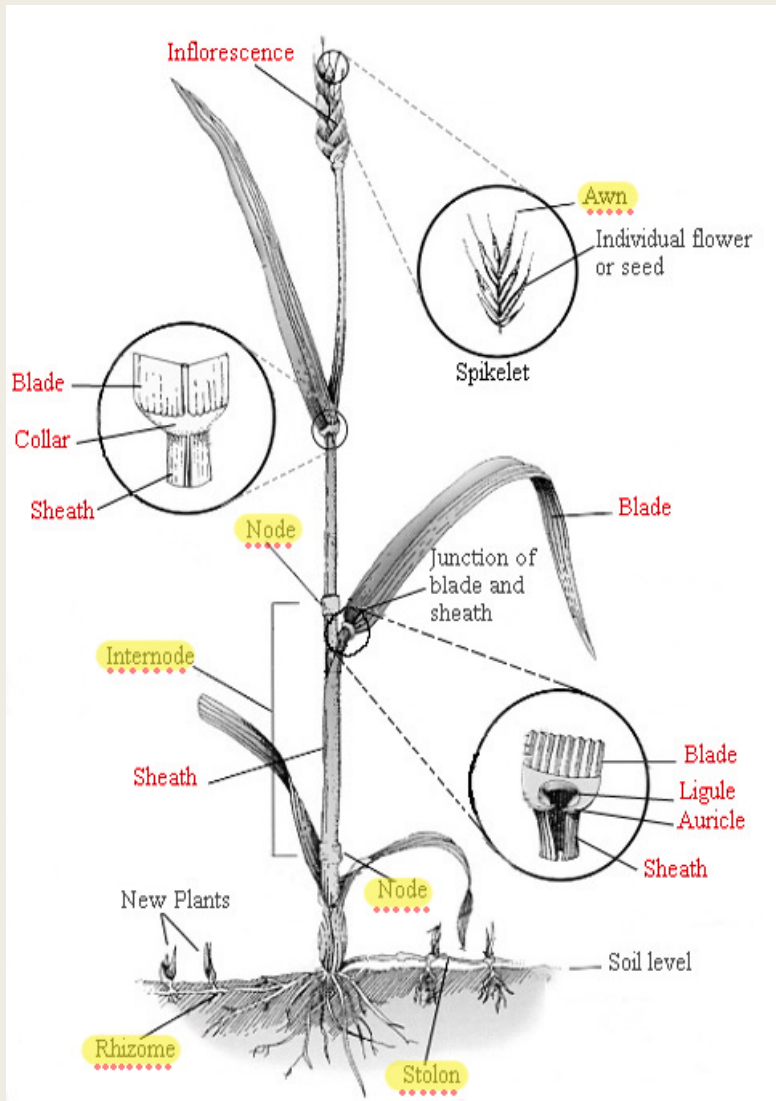
PLANT
CHARACTERISTICS
THAT AID IN
IDENTIFICATION



LEAF, STEM AND OTHER VEGETATIVE CHARACTERISTICS



Leaf Structures



Grass leaves alternate along the stem. This is referred to as two-ranked.

The culm is the central axis of a grass plant, also called the stem.

The sheath is the part of the leaf that wraps around the stem.

The blade is the part that of the leaf above the sheath.

The collar is the area on the outer surface of the leaf where the sheath and blade join.

The ligule is an appendage located on the inside of the leaf where the sheath and blade meet.

Auricles are ear-like lobes at the base of a blade or top of the sheath.

Nodes are the part of the stem where the leaves are produced.

Internodes are the part of the stem between nodes.

For additional information about leaf structures that aid in identification go to:

<http://spuds.agron.ksu.edu/Grassint.htm>

Vegetative Characteristics to Use in Identifying Plants

- ❖ Leaf Color
- ❖ Presence of striations (parallel lines or groves) on blade*
- ❖ Presence and location of hairs
- ❖ Presence of glands
- ❖ Type of ligule*
- ❖ Appearance of collar*
- ❖ Presence of auricles*
- ❖ Leaf shape, arrangement and attachment to stem
- ❖ Leaf Margins

*Apply to grasses

Photo: Grazed Big Bluestem



Leaf Color

Common colors include:

- ❖ Dark Green
- ❖ Bright Green
- ❖ Yellow-green
- ❖ Blue-green
- ❖ Gray-green

Upper Photo: Western wheatgrass showing blue-green color.

Lower Photo: Threadleaf sedge showing yellow-green color.



Leaf Ridges

Examples of grasses with distinct ridges:

- ❖ Western Wheatgrass
- ❖ Needleandthread
- ❖ Porcupine grass

These types of leaves are referred to as striate which means: marked with slender, longitudinal grooves or lines and appearing striped.

Photo: Western Wheatgrass leaf showing ridges and striping





Presence and Location of Hairs

Examples of grasses with hairs:

- ❖ Big Bluestem: Long hairs on lower portion of leaf blade
- ❖ Buffalograss: Hairs on upper and lower leaf surfaces
- ❖ Hairy Grama: Hairs on leaf margins
- ❖ Indiangrass: Hairs on sheath
- ❖ Sideoats Grama: Hairs on leaf margins
- ❖ Switchgrass: V of hairs at leaf base

Photo: Vegetative tillers of Indiangrass showing hairs on the sheath

Plant Hair Terminology

Appressed: Pressed closely to leaf surface

Glabrous – Smooth without hairs

Glaucous – covered with a waxy, powdery “bloom”

Hirsute – With straight, stiff hairs

Hispid – With long, stiff hairs

Pilose – covered with soft hairs

Pubescent – With soft, downy hairs

Strigose – With stiff, straight, appressed hairs

Tomentose – Covered with matted and tangled hairs

Villous – Densely hairy with long, soft hairs

Photo: False gromwell showing leaves covered with stiff hairs.



Presence of Glands on Leaves

Example of grasses with glandular vegetation:

- ❖ Sideoats Grama: Glands on margins of leaves at base of hairs

Photo: Glandular hairs on sideoats grama leaf, Photo source Wildflower.org.



Type of Ligule

A ligule is an appendage or ring of hairs on the inside of the leaf at the junction of the leaf and sheath.

Examples of grasses with distinct ligules:

- ❖ Blue Grama: Short fringe of hairs
- ❖ Indiangrass: Ligule is long, membranous and splits in half at maturity. This has been described as rabbit ears or claws.
- ❖ Little Barley: Ligule is short and toothed
- ❖ Needleandthread: Ligule is large and membranous

*Photo: Indiangrass Ligule, Photo source
kswildflower.org*



Appearance of Collar

The collar is the area on the outside of the leaf at the junction of the blade and sheath.

In some grasses the collar has a distinct appearance:

- ❖ Prairie Sandreed has an inflated yellow collar
- ❖ Sand lovegrass has prominent hairs at the collar
- ❖ Sand dropseed has a dense ring of hairs at the collar

Photo: Vegetative Sand Dropseed showing the ring of hairs



Auricles

Auricles are ear-like projections at the base of the leaf blade.

Examples of grasses with auricles:

- ❖ Western Wheatgrass
- ❖ Canada Wildrye
- ❖ Intermediate Wheatgrass
- ❖ Quackgrass

Photo: Canada wildrye





Common Leaf Shapes

- ❖ Linear – Long and Narrow with parallel sides
- ❖ Oblong – Wide and long
- ❖ Lanceolate – Lance shaped, wide at bottom, tapering to a point.
- ❖ Oblanceolate – reverse of lanceolate, wide at the top and narrow at the bottom
- ❖ Ovate – egg shaped and widest at the bottom
- ❖ Obovate – Upside down egg shaped with the widest at the top
- ❖ Orbicular (Orbiculate) – nearly circular or rounded
- ❖ Chordate – Heart Shaped
- ❖ Elliptical – similar to ovate, but narrower at ends

Photo: Showy Milkweed leaves are ovate to elliptic in shape.

Leaf Types

Simple – The leaf blade is undivided

Tri-Foliolate – The leaf blade is divided into three leaflets

Compound – The leaf blade is divided into several leaflets.

- ❖ Palmate – Leaflets are arranged around a central point
- ❖ Pinnate – Leaflets arranged along the central axis or rachis
 - ❖ Even-pinnately compound
 - ❖ Odd pinnately compound
 - ❖ Bipinnately compound – the leaflets are further subdivided

Top Photo: Catclaw Sensitive–briar with bipinnately compound leaves.

Bottom Photo: Breadroot Scurfpea with palmately compound leaves.



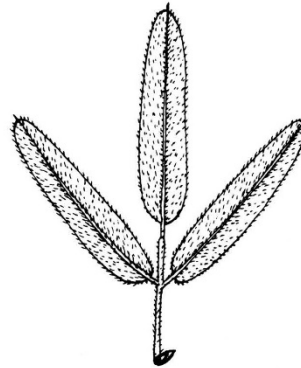
Leaf Types



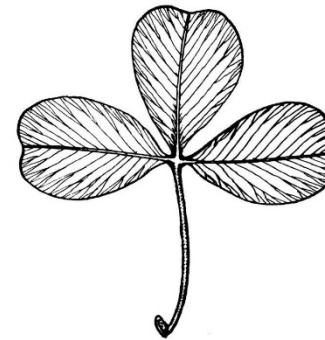
simple (pinnate venation)



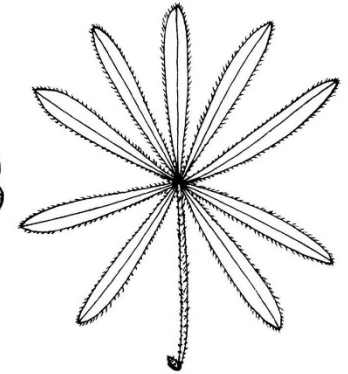
simple (parallel venation)



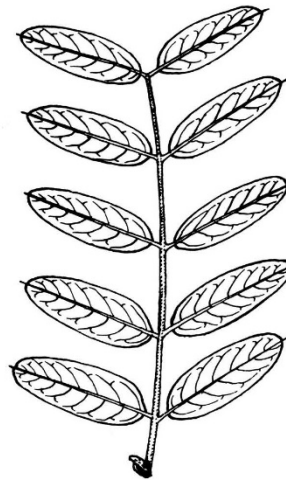
pinnately 3-foliate



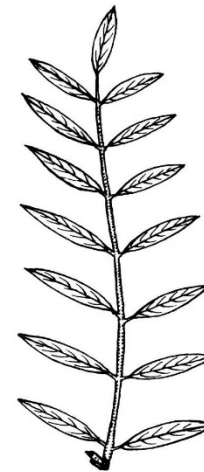
palmately 3-foliate



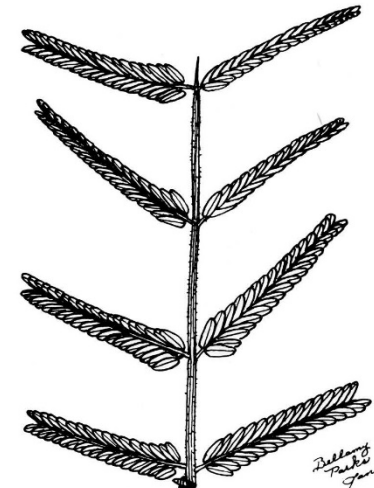
palmately compound



even-pinnately compound



odd-pinnately compound



bipinnately compound

Diagram from *Common Forbs and Shrubs of Nebraska*

*Delbert
Parker
Graham*



Leaf Arrangement

- ❖ Alternate – Located singly at each node
- ❖ Opposite – Two leaves are located across the stem or opposite from each other
- ❖ Whorled – Three or more leaves are located at the same level on the stem.

Photo: Silky Prairie Clover has compound leaflets with an alternate arrangement.

Leaf Attachment to Stem

- ❖ Sessile – Leaf is attached directly to the stem; no pedicel (stalk)
- ❖ Petioled – Leaf is attached to the stem with a pedicel
- ❖ Clasping – Base of leaf is wrapped around the stem
- ❖ Decurrent – Base of leaf extends downward from the point of attachment to the stem

Photo: Blowout Penstemon has sessile and clasping leaves.



Leaf Margins

- ❖ Entire – Margin is smooth and continuous
- ❖ Undulate – Margin is wavy
- ❖ Serrate – Margin is saw-toothed and the teeth point up. When the teeth are very small, this is described as *serrulate*.
- ❖ Doubly Serrate – The margin is saw-toothed and there are paired serrations
- ❖ Dentate – Margin has pointed, coarse teeth that spread at right angles to the margin. When the teeth are very small, this is described as *denticulate*.
- ❖ Dissected – Leaf margins are deeply divided into numerous slender parts

Photo: Serrateleaf evening primrose leaves have a serrate leaf margin.



INFLORESCENCE TYPES AND CHARACTERISTICS



What is an Inflorescence?

An inflorescence is the complete flower head of a plant. This includes:

- ❖ The arrangement of flowers on the plant, and
- ❖ The complete flower head including stems, stalks, bracts and the flower

Photo: Bush Morning Glory



Inflorescence Types

Solitary - A single flower is located at a specific position on the plant.

Raceme – The spikelets or flowers are pedicelled (stalked) on the rachis (flower bearing stem)

Spike – The flower is similar to a raceme, but the flowers are attached directly to the rachis

Panicle – The flower has a main axis and compound branches

Umbel – The flower is flat-topped or rounded with branches coming from a common point

Corymb – The flower is simple, short, broad and flat-topped and has pedicels of different lengths

Cyme – The flower cluster is convex or flat-topped with the central flower opening first

Head – The inflorescence is a cluster of sessile or nearly sessile flowers on a short axis

Drawings of these inflorescence types may be found at:

[Kansas Wildflowers and Grasses](#)

[The Science Info](#)

[Biology Discussions](#)

[Common Forbs and Shrubs of Nebraska](#)



Inflorescence Type: Solitary

A single flower is located at a specific position on the plant.

Examples include clammy ground cherry, buffalo gourd, serrateleaf evening primrose and sego lily



Top photo: Sego lily

Bottom photo: Clammy groundcherry

Inflorescence Type: Raceme

The flowers are made up of spikelets that are pedicelled (stalked) on the rachis (flower bearing stem)

Examples include sand paspalum, Lambert crazy weed, Nebraska lupine, woolly locoweed, and western ragweed (male flowers)

Top photo: Lambert's crazyweed

Bottom photo: Woolly locoweed





Inflorescence

Type: Spike

The flower is similar to a raceme, but the flowers are attached directly to the rachis

Examples include purple prairie clover, white prairie clover, hoary vervain, plains snakecotton, woolly plantain and western wheatgrass

Top photo: Hoary vervain

Bottom photo: White prairie clover

Inflorescence Type: Panicle

The flower has a main axis and compound branches

Examples include switchgrass, sand lovegrass, prairie junegrass, and white penstemon

Top photo: White penstemon

Bottom photo: Prairie junegrass





Inflorescence Type: Umbel

The flower is flat-topped or rounded with branches coming from a common point

Examples include common milkweed, green milkweed, sand milkweed, dwarf milkweed and poison hemlock



Top photo: Common milkweed

Bottom photo: Poison hemlock

Inflorescence Type: Corymb

The flower is simple, short, broad and flat-topped and has pedicels of different length

Plants with corymb and corymb-like inflorescences include common (western) yarrow, stiff goldenrod, Riddell's groundsel, and prairie groundsel

Top photo: Common yarrow

Bottom photo: False boneset





Inflorescence

Type: Cyme

The flower cluster is convex or flat-topped with the central or first flower blooming first

Plants with cyme and cyme-like inflorescences include Carolina gromwell (plains puccoon), Indian plantain and hemp dogbane.



Top photo: Pussytoes

Bottom photo: Hemp dogbane

Inflorescence

Type: Head

The inflorescence is a cluster of sessile or nearly sessile flowers on a short axis. (A *sessile flower attaches directly to the stem*).

Plants with head type inflorescences include plains sunflower, annual sunflower, tall boneset, prairie coneflower, rosinweed, greenthread and many other plants in the composite family.

Top photo: Upright coneflower

Bottom photo: Greenthread



Activities

Study the grass plant diagram which is provided in this lesson and know the structures that are important in grass identification.

Study the flower diagrams found in the lesson references and be able to label legume flower parts as well as general flower parts.

Learn to identify the most common grasses, forbs and shrubs found on Nebraska's rangelands many of which are listed here:

Common grasses of Nebraska Rangelands:

Cool season grasses and grasslikes:

Needleandthread, prairie junegrass, western wheatgrass, threadleaf sedge, Canada wildrye and Scribner rosette grass

Warm season grasses: Prairie sandreed, Indiangrass, sand lovegrass, big bluestem, sand bluestem, little bluestem, blue grama, hairy grama, switchgrass, sideoats grama, sand dropseed, and buffalograss.

Forbs: Annual buckwheat, annual sunflowers, cudweed sagewort, common yarrow, evening primroses, gayfeather, heath aster, milkvetches, milkweeds, penstemons, prairie coneflower, prairie clovers, rocky mountain beeplant, scarlet globemallow, scurfpeas, verbena, western ironweed, western ragweed

Shrubs: Broom snakeweed, fringed sagewort, leadplant, snowberries, and yucca

Cacti: Plains Pricklypear, Bigroot Pricklypear and Brittle cactus



Prairie Sandreed



*Lavendar leaf
Evening Primrose*



Western Snowberry

END OF LESSON FIVE