













Introduction to Grass Morphology

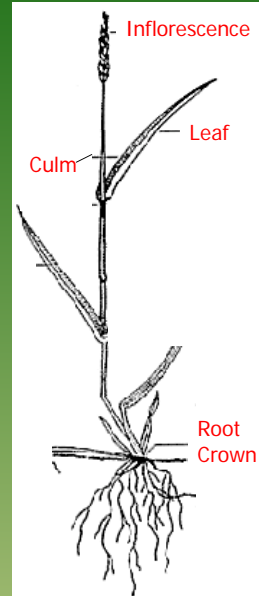
Wildland Plant Identification
351

Grasses are monocots

MONOCOTS				
EMBRYOS	LEAF VENATION	STEMS	ROOTS	FLOWERS
 One cotyledon	 Veins usually parallel	 Vascular bundles usually complexly arranged	 Fibrous root system	 Floral parts usually in multiples of three
DICOTS				
 Two cotyledons	 Veins usually netlike	 Vascular bundles usually arranged in ring	 Taproot usually present	 Floral parts usually in multiples of four or five

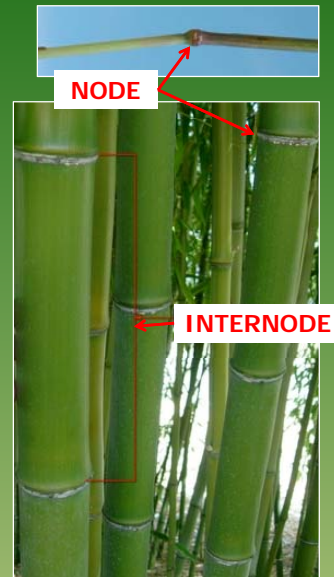
Basic grass morphology

- **Inflorescence**
or seedhead
- **Leaf** *or lamina*
- **Culm** *or stem*
- **Root crown and roots**



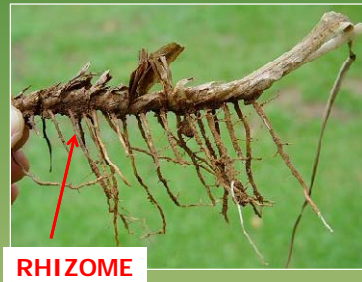
Culm

- **Culm**
 - hollow or pithy jointed stem on grasses, sedges and rushes
- **Nodes**
 - joints along stem where leaves are borne
- **Internode**
 - portion of stem between two successive nodes



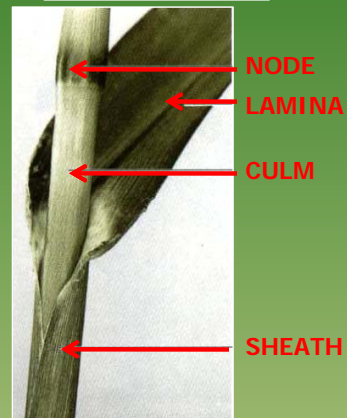
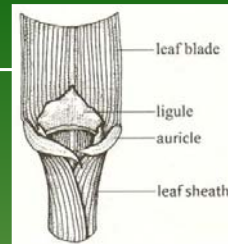
Modified Stems

- **Adventitious stems**
 - either rhizomes or stolons
- **Stolons (runners)**
 - above ground, horizontal stems with nodes, internodes and leaves
- **Rhizomes**
 - underground, horizontal stems; will grow a plant and roots at a node



Leaf

- **Leaf Blade**
 - part of leaf that bends away from stem, usually flat to facilitate photosynthesis
- **Sheath**
 - tubular, lower part of leaf that encloses stem



Leaf

- **Flag Leaf**

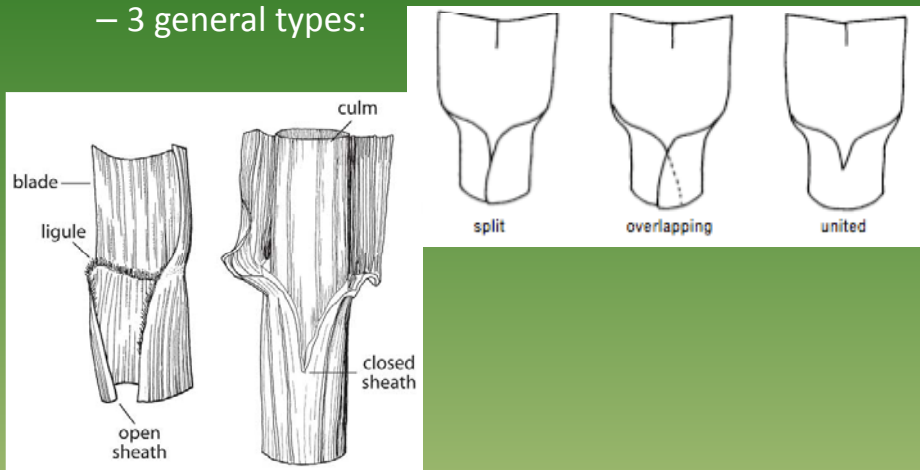
- The upper most leaf of a grass often sticks out perpendicular to the stem and is called the “flag leaf”



Leaf

- **Sheath**

- tubular, lower part of leaf that encloses stem
- 3 general types:



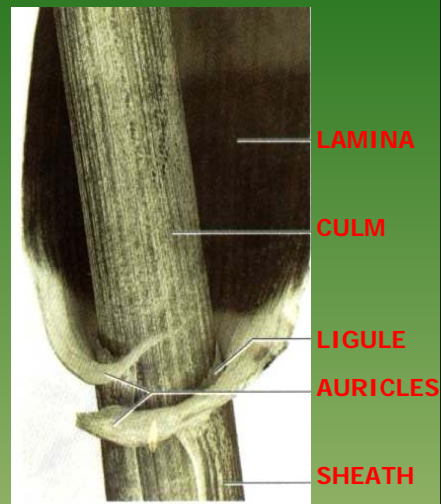
Leaf

- **Collar**
 - outer side (abaxial) of leaf at junction of sheath and blade
 - two structures found inside collar
 - ligules
 - auricles



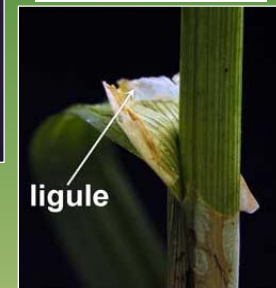
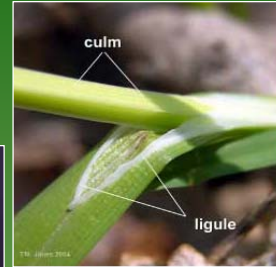
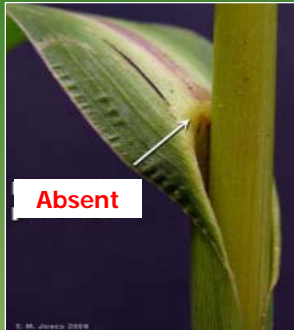
Leaf

- **Ligule**
 - membrane-like tissue (or line of hairs)
 - on adaxial (inner) side of collar
 - extends from junction of sheath and blade
- **Auricles**
 - small appendages at junction of blade and sheath



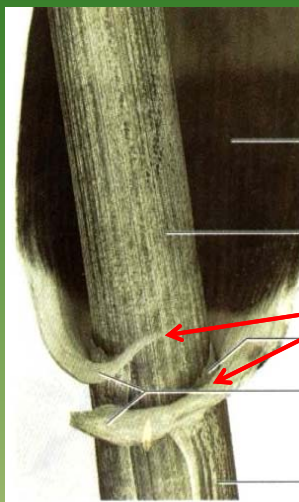
Leaf

Ligules can be:



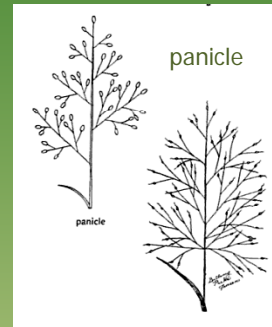
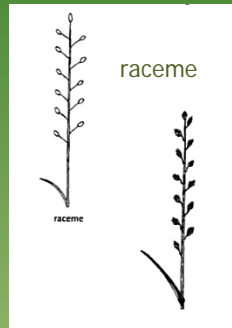
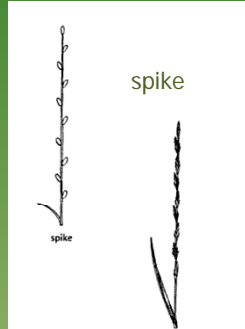
Leaf

Auricles can be:



Inflorescence

- The group of flowers or seeds in a grass.
- Arranged on the stem: spike, raceme or panicle



Types of Inflorescence

- **Spike**
 - flowers sessile (without a stalk) along the rachis



Bottlebrush squirreltail
(*Elymus elymoides*)



Crested wheatgrass
(*Agropyron crestatum*)



Bluebunch wheatgrass
(*Elymus spicatus*)

Types of Inflorescence

- **Panicle**

- primary axis bears branched secondary axes with pedicellate spikelets
- “branching branches”



Switchgrass (*Panicum virgatum*)



Cheatgrass (*Bromus tectorum*)

Types of Inflorescence

- **Raceme**

- unbranched axis bearing spikelets
- not very common in grasses

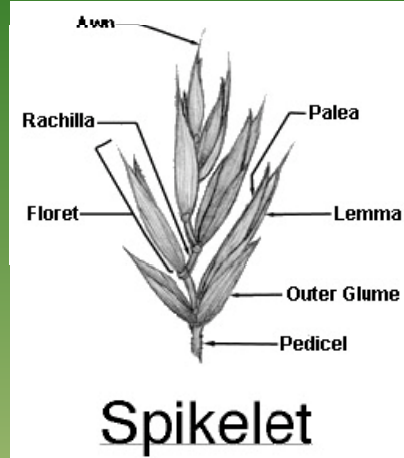


Little bluestem (*Schizachyrium scoparium*)

Inflorescence

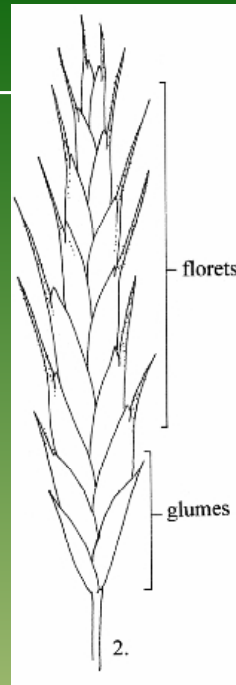
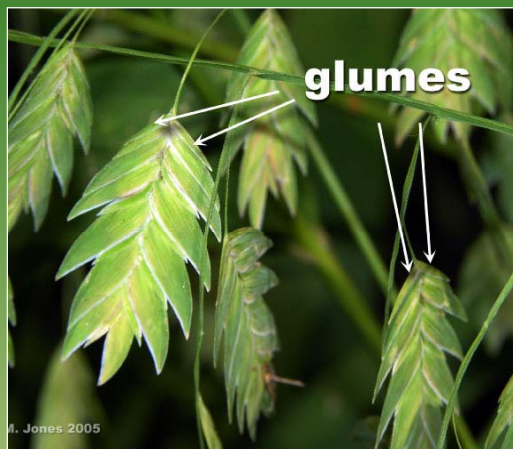
Made up of spikelets which are groups of flowers, called florets

- **Spikelet**
basic unit of inflorescence usually consisting of:
 - 2 glumes
 - 1 or more florets
 - Made of palea & lemma
- The branch at the base of the spikelet is a pedicel and any branches inside the spikelet are called rachilla



Inflorescence

- **Glumes**
– pair of bracts at base of spikelet



Inflorescence

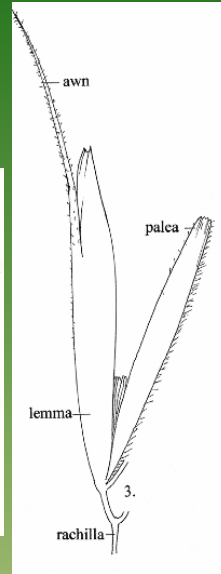
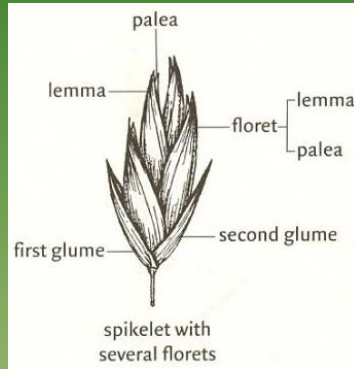
Floret = Palea + Lemma

- **Palea**

- Inside bract of floret (above lemma)

- **Lemma**

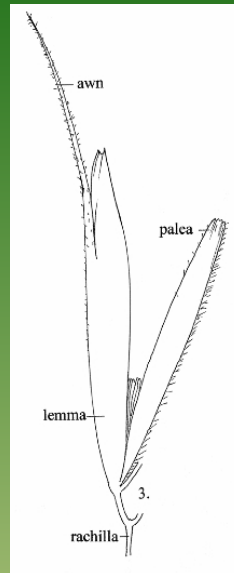
- Outer bract of floret (subtends flower & palea)



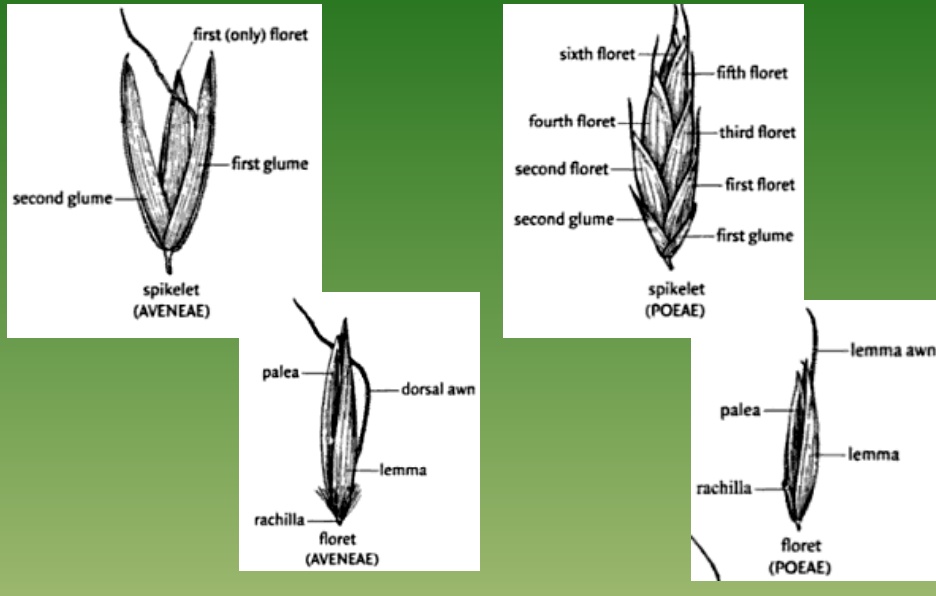
Inflorescence

- **Awn**

- slender bristle
 - extension of lemma



Inflorescence



Growth Habits

Caespitose

- growing in a dense clump
- bunchgrass

Rhizomatous

- Spreads by rhizomes
- Sod forming

Stoloniferous

- Spreads by stolons
- sod-forming

• Crown

- persistent base of perennials

