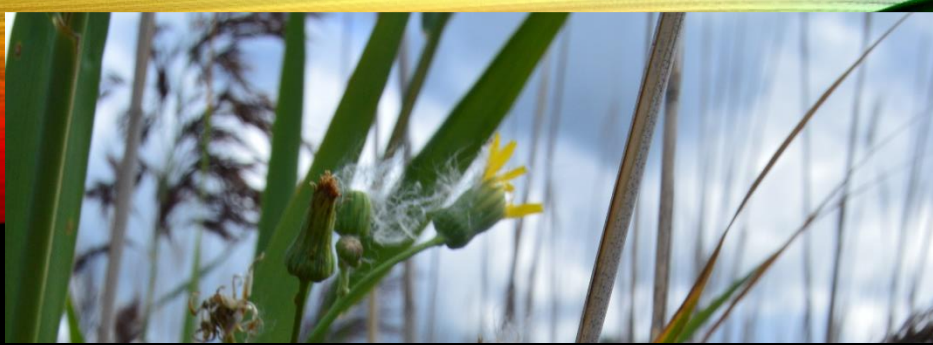




WEED WORKSHOP

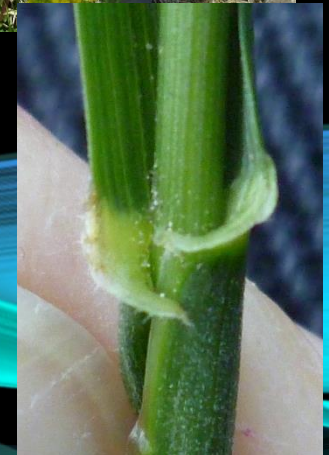
Weed Identification



Dr. Hannah M. Mathers*

**Mathers Environmental Science
Services, LLC**

www.mathersenvrionmental.com





Agenda:

1:00 – 1:35 – Terms, Life Cycles and Plant Structures – help with Weed Identification

1:40 – 2:40 – Practical – Divide in three groups and rotate stations until finished all three

2:40 – 2:55 - Break

2:55 – 3:30 – Questionnaire

3:30 – 4:00 – Weed controls – by weeds

NON-VASCULAR



Moss & Liverworts



Lichen



VASCULAR PLANT – NO SEED

HORSETAIL (*EQUISETUM ARVENSE*)

- Reproductive – 1st stakes – early April die after release

Spores germinate in soil and form new plants



VASCULAR PLANTS – NAKED SEED

- Gymnosperms - conifers



VASCULAR PLANTS – COVERED SEED - ANGIOSPERMS

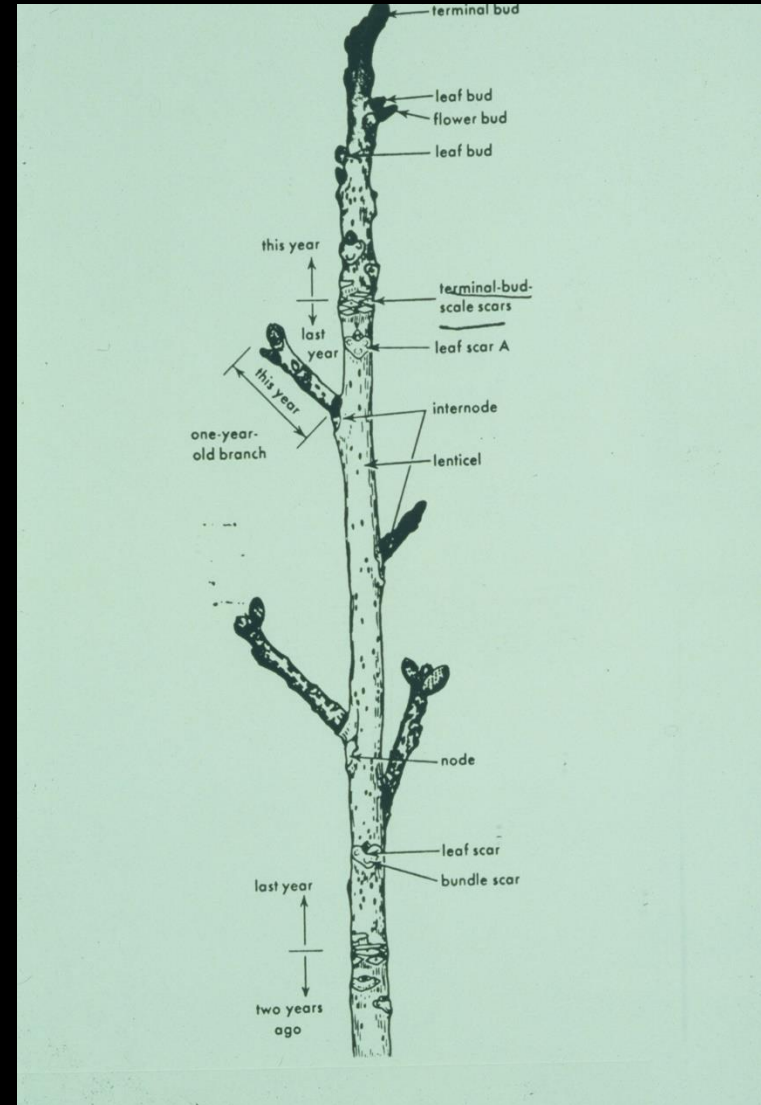


MONOCOTS

Growing point?



DICOTS





Conyza canadensis
Marestail/horseweed

VASCULAR PLANT

- **Dicot (Broadleaves)** = palmate or pinnate venation = main veins radiate from a central point at the petiole
- two cotyledons at emergence

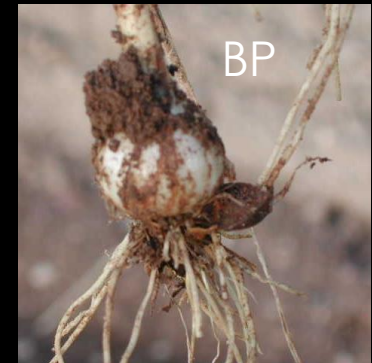


Attenuate leaf base

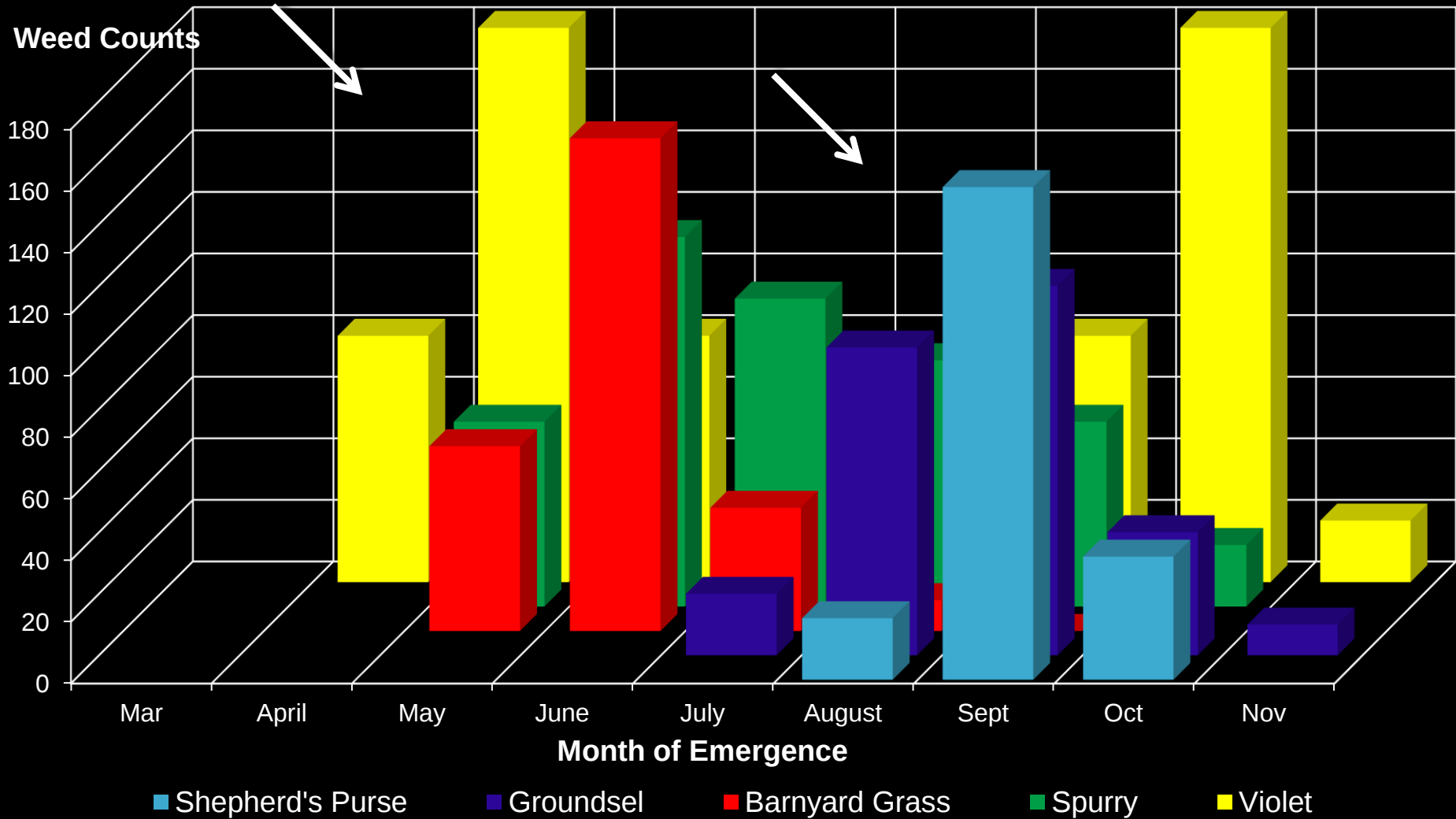
6 LIFE CYCLES OF WEEDS:



- ① Summer annuals
- ② Winter annuals
- ③ Biennials
- ④ Simple perennials
- ⑤ Bulbous perennials
- ⑥ Creeping perennials



Weed Emergence Continuum



ROOT TYPES

- Tap root -- main root enlarging and growing downward
- Fibrous roots -- thin, thread-like roots
- Adventitious root -- root growing from something other than root tissue, e.g. stem, etc.



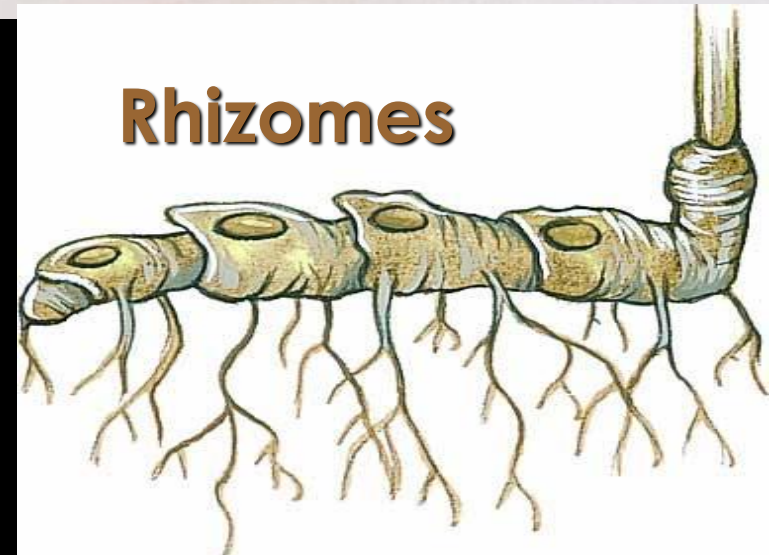
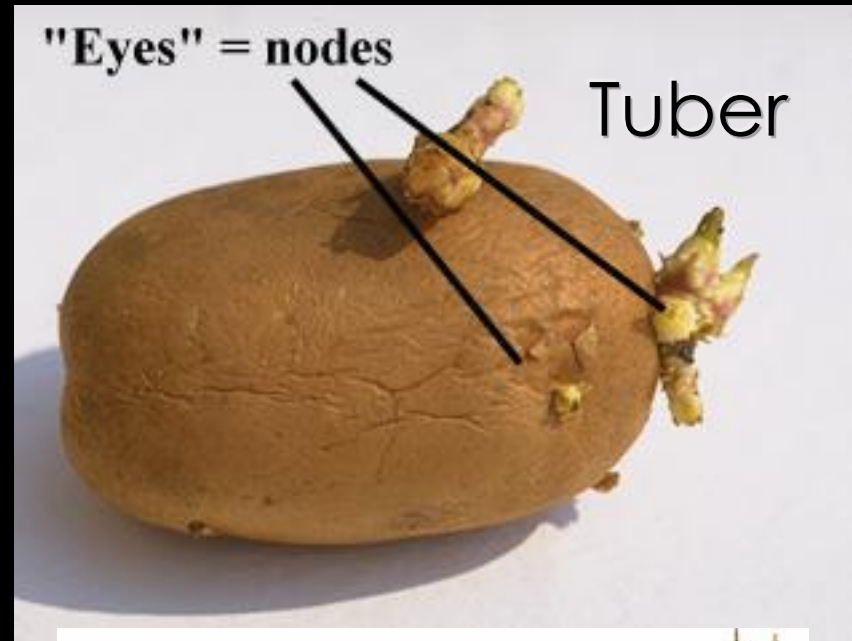
STEM MODIFICATIONS

- Stolon—above ground stem, has buds which sprout to form new shoots
- Bulb--underground stem with fleshy leaves which store food, e.g. wild garlic
- Corm--solid, fleshy underground stem with papery leaves, e.g. *Gladiolus*



STEM MODIFICATIONS

- Tuber--underground stem enlarged for storage of food--has nodes (unlike tuberous root)
- Rhizome--underground stem, often has buds which sprout to form new shoots



PERENNIAL STRUCTURES

- Simple perennial
 - Single taproot
 - Ex. Dandelion
 - Bulbous
 - Ex. Wild garlic
- Creeping perennial
 - Rhizomes: below ground *modified stems*
 - Stolons: Above ground *modified stems*
 - Creeping roots: Below ground roots
 - Tubers: Underground storage organs capable of producing stems and roots

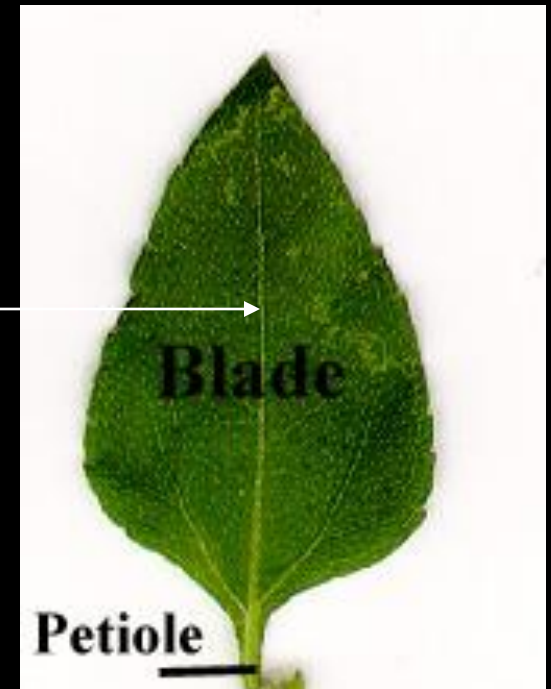
PARTS OF A LEAF

- Petiole--the stalk of a leaf; a leaf without a petiole is **sessile**
- Blade--the flat, expanded portion of the leaf
- Veins vascular system in the blade.

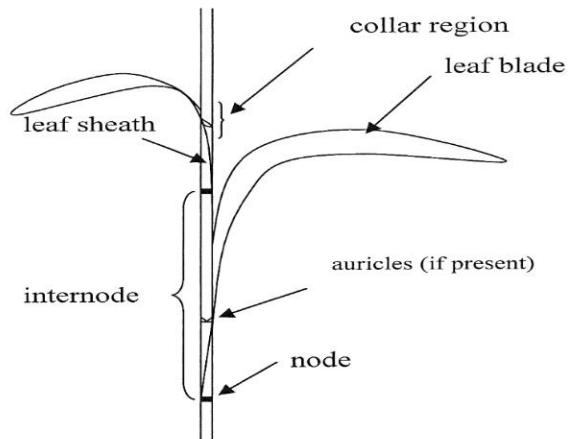
Lack petiole
=sessile



veins →



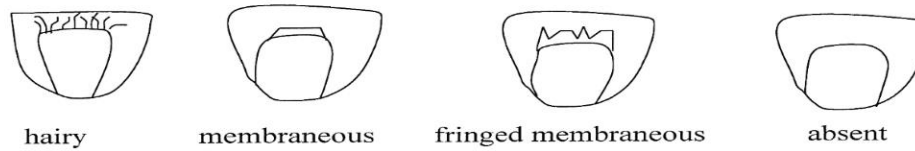
Poaceae family: (Grasses)



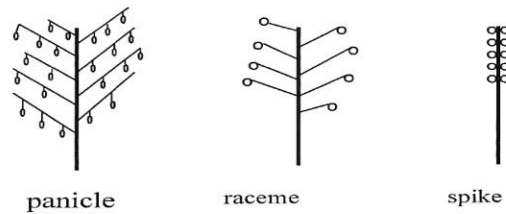
Types of auricles



Types of Ligules



Types of common inflorescences



• Grasses

- **Leaf bud** — folded or rolled
- **Ligules** — membranous, absent, hairy, membranous fringed
- **Auricles** — absent, clasping, blunt or lobed
- **Pubescence** — blade, sheath
- **Leaf tips** — prow — shaped
- **Inflorescence** — loose, awns, drooping, dense



Goosegrass ligule

- winter annual
- membranous ligule
- no auricle
- folded in the bud

“boatshaped” tip





Rolled in the leaf bud
Fringed membranous
Absent auricles

Dense soft hairs

Brome



SETARIA SPP. GREEN (FRONT) AND GIANT FOXTAIL (BACK)

- All have hairy ligules
- No auricles
 - Hair (fuzzy) covers entire upper leaf sheath
 - **Giant foxtail (*Setaria faberi*)**
 - Long hairs at base of leaf, flat stem
 - **Yellow Foxtai (*Setaria glauca*)**
 - No hair on leaves but hairs on leaf sheath margins
 - **Green foxtail (*Setaria viridis*)**



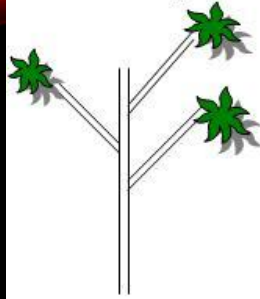
GRASS IDENTIFIABLE FEATURES

- Quack grass: clasping auricles, creeping perennial
- Barnyard grass: no ligule or auricles
- Large crabgrass: very hairy, membranous ligule, can root at the nodes.

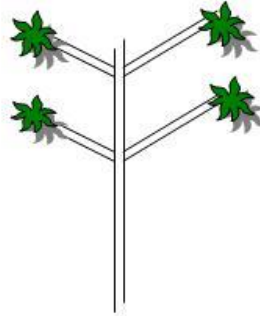


Broadleaf identification (dicots)

Leaf arrangements



alternate



opposite



whorled

Leaf margins



Entire



serrate



dentate



crenate



sinuate



lobed

Leaf shape



Linear



oblong



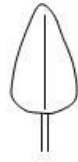
elliptic



lanceolate



cordate



ovate



obovate



spatulate

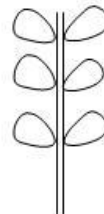
Compound leaves



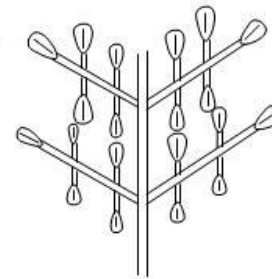
reniform



pinnatifid



pinnate



bipinnate

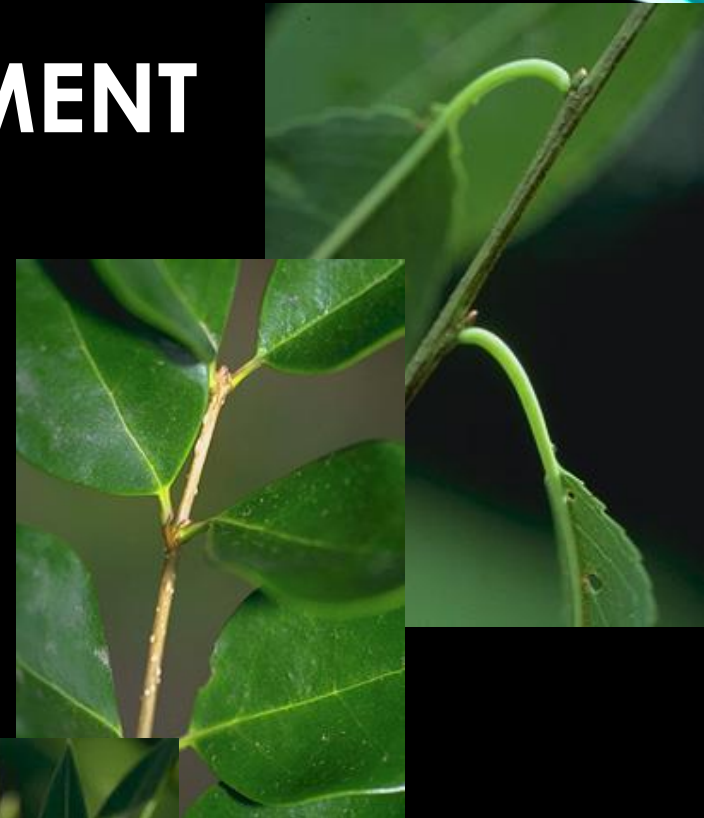
LEAF ARRANGEMENT

Alternate--leaves arranged
1/node

Opposite--leaves arranged
2/node

Whorled--arranged $2 \geq$ /node

Fascicled--leaves grouped in
small, tight bundles



LEAF SHAPES



Cordate



Elliptical



Lanceolate



Oblong



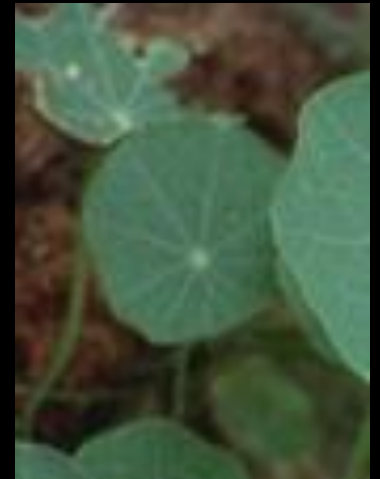
Linear



Ovate



Trifoliate



Peltate

PARTS OF A NODE

Stipule -- flat, often leaf-like flap **below** a leaf. Not all leaves have stipules. Stipules can be highly modified into tendrils, scales, etc.

Axillary bud -- the bud in the axil -- the angle between the leaf and the stem.



SIMPLE LEAVES



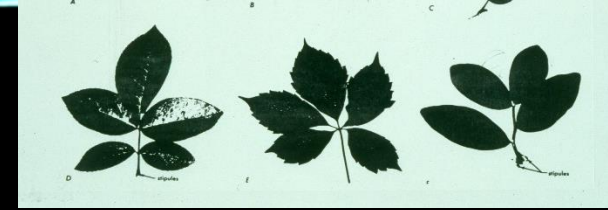
The blade is all in one piece.

*Everything **above** the auxiliary bud is **all one leaf.***

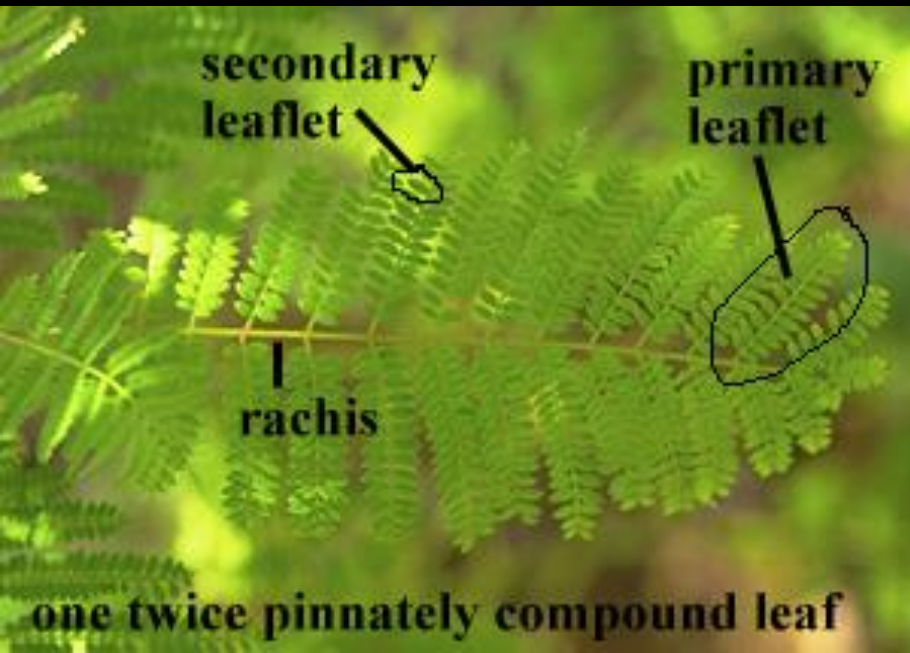


COMPUND LEAVES

The blade is divided **all the way to the rachis** into two or more pieces. Note that every leaf has its own auxiliary bud.



One pinnately
Twice pinnately
Palmately



This is one leaf

POLLINATION

- Insect – 80%
- Wind – 20%
- Water - <1%



Acer saccharum
Sugar Maple



SPINY SOWTHISTLE

SONCUS ASPER

- Asteraceae family
- Wind blown pappus
- Summer annual (can germinate anytime), very hardy



WINTER ANNUALS - BRASSICACEAE FAMILY

- Many are winter annuals
- Bittercress
- Shepard's purse
- Field pennycress
- Yellow rocket (sometimes biennial)
- Treacle mustard
- Wild mustard
- Mouse ear cress
- *Rorippa palustris*



Thlaspi arvense
Field pennycress

CHENOPODIUM ALBUM COMMON LAMBSQUARTERS



ARABIDOPSIS THALIANA –
MOUSEAR CRESS,
“PEPPERGRASS”



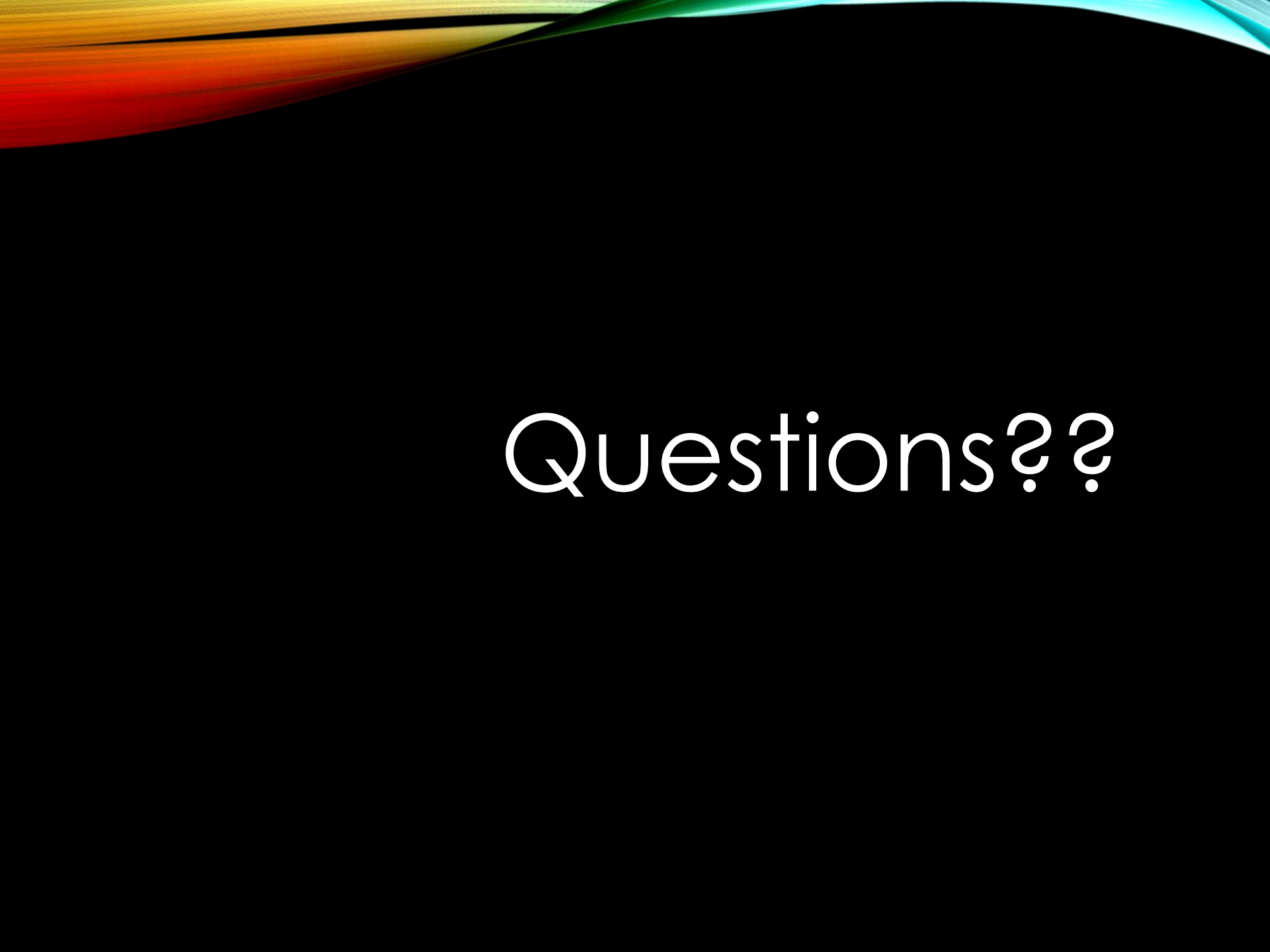
GALINSOGA CILIATA – HAIRY GALINSOGA



ERODIUM CICUTARIUM – REDSTEM FILAREE







Questions??