

# **Weed Identification Hints**

Women Managing the Farm Conference

February 11, 2022

Dr. Kevin Donnelly

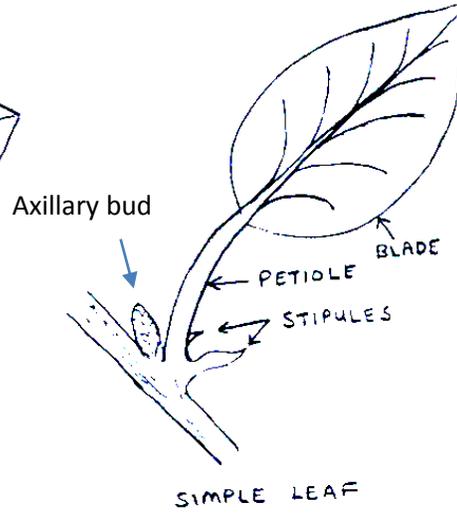
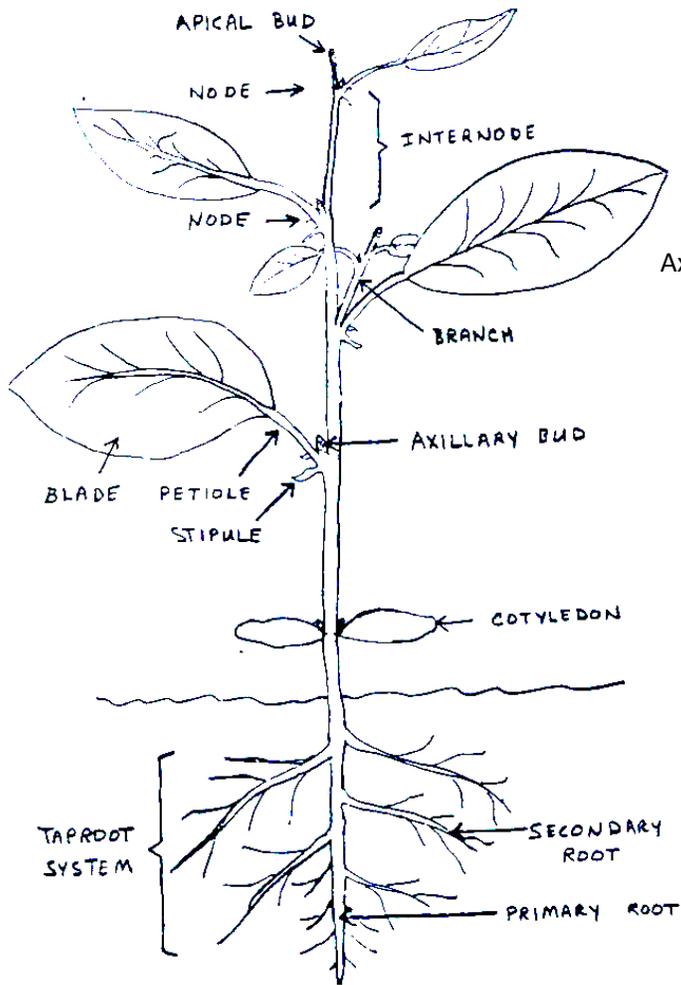
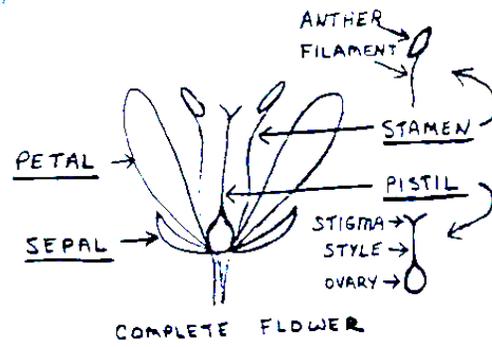
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Department of Agronomy

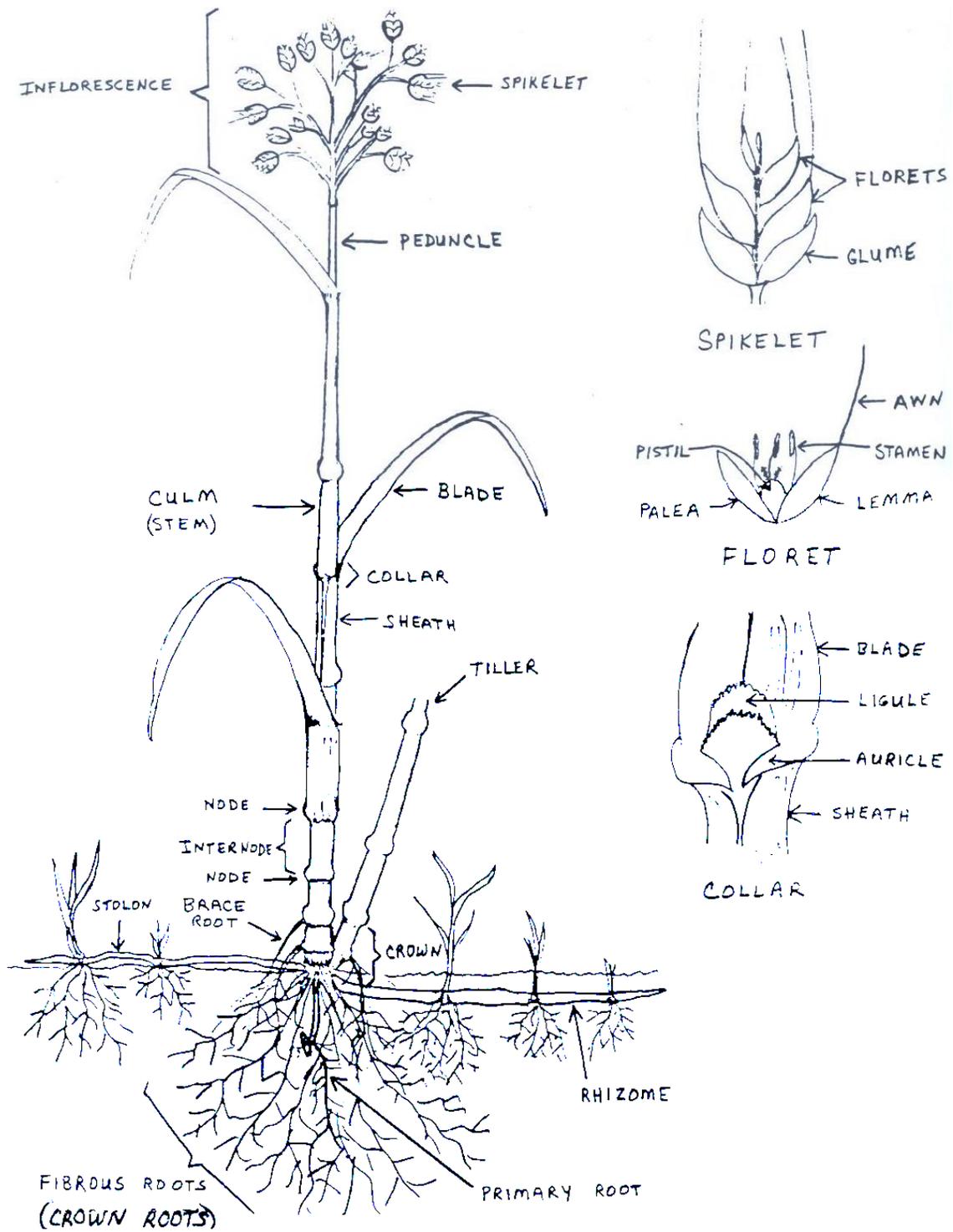
Kansas State University

Manhattan, KS

PRINCIPAL PARTS OF A GENERALIZED DICOT PLANT



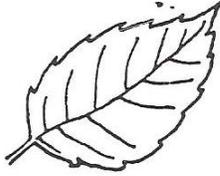
PRINCIPAL PARTS OF A GENERALIZED GRASS PLANT



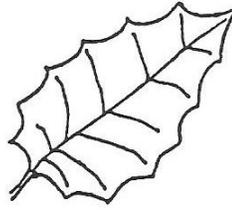
Leaf Margins



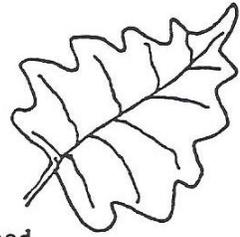
entire



serrate



dentate



lobed

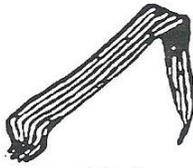


parted



divided

Leaf Venation



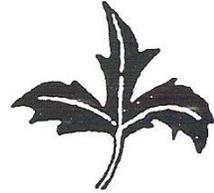
parallel



netted  
(reticulate)

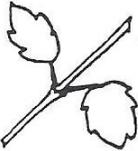


pinnate

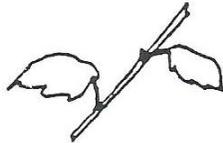


palmate

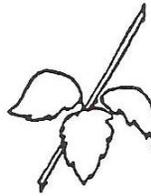
Leaf Arrangement



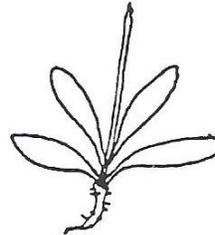
opposite



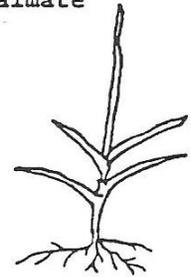
alternate



whorled  
(verticillate)



rosette

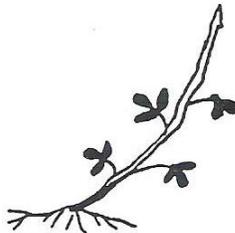


basal

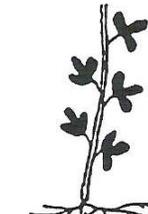
Stem Types



acaulescent



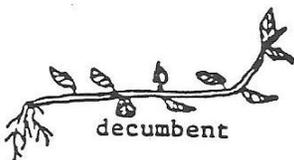
ascending



caulescent



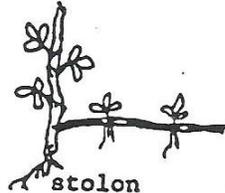
prostrate



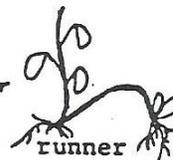
decumbent



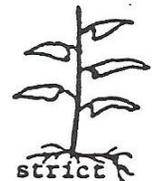
caespitose



stolon

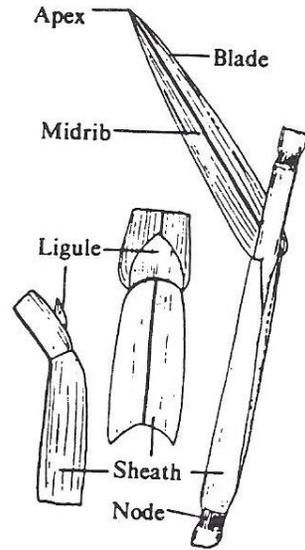
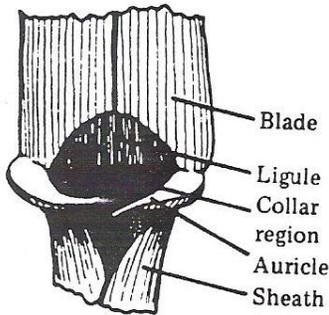
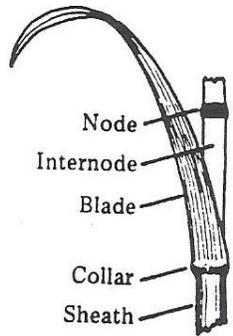


runner

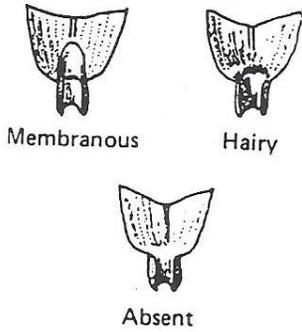


strict

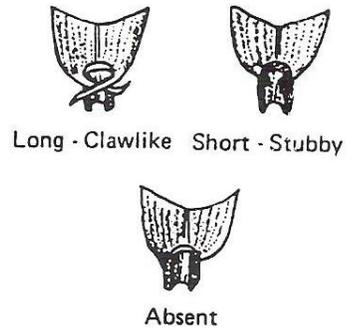
# Grass Characteristics



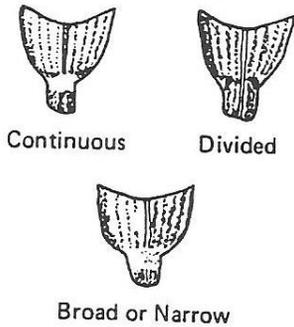
## CHARACTERISTICS OF LIGULES



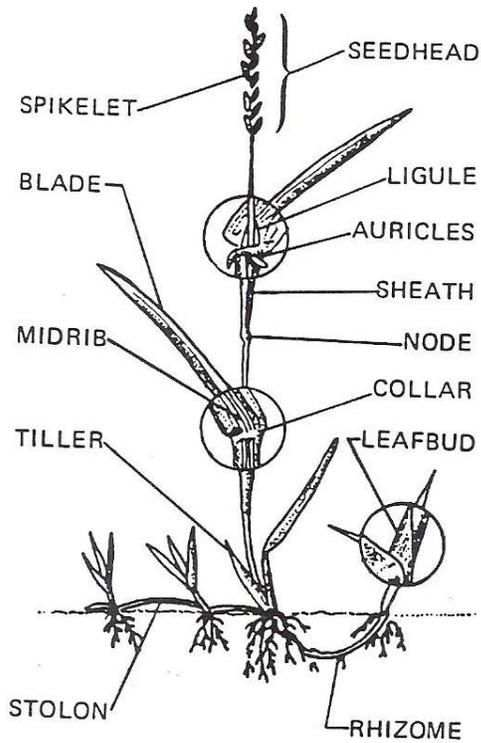
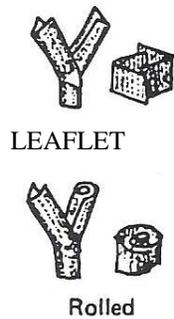
## CHARACTERISTICS OF AURICLES



## CHARACTERISTICS OF COLLARS



## CHARACTERISTICS OF LEAFBUDS



## Plant Anatomy Terms

- Auricles** - Pointed structures that project from each side of the leaf collar region of a grass leaf.
- Bristle** - Stiff, erect, coarse hair.
- Cotyledons** - Fleshy “seed leaves” that contain the energy for a dicot seed.
- Crown** - Compressed stem tissue at the base of a grass plant from which roots and tillers arise.
- Inflorescence** - The flowering structure of a plant.
- Internode** - The region of a stem between two successive nodes.
- Leaf axil** - The junction between the leaf and stem.
- Leaf blade** - The flat, expanded portion of the leaf.
- Leaf collar** - The elastic region at the junction of the blade and sheath of a grass leaf.
- Leaf sheath** - Portion of a grass leaf that surrounds the stem and attaches to a node at the base.
- Leaflet** - One of the small, blade subunits of a compound leaf.
- Ligule** – A hairy or membranous appendage of a grass leaf that clasps the stem where the sheath and blade join. Projects upward from the inside collar region at junction of the blade and sheath.
- Node** - Slightly enlarged portion of the stem where leaves, buds, and stems arise.
- Ocrea** - Thin, sheath like structure wrapping around both the base of the petiole and the stem.
- Panicle** - An inflorescence in which the lateral branches arising from the peduncle produce flower-bearing branches instead of a single flower
- Pedicel** – The stalk immediately below a spikelet in grasses or a single flower in dicots
- Peduncle** - The top section of the stalk that supports an entire inflorescence.
- Petal** - The generally colorful parts of a flower.
- Petiole** - The stalk portion of the leaf; extends from stem to blade.
- Pistil** - The female part of a flower that produces the fruit and seeds; composed of stigma, style and ovary
- Pubescence** - A covering of short, soft hairs.
- Raceme** - An inflorescence in which the single flowers or spikelets are attached by pedicels of equal length arranged on a common elongated axis.
- Rhizome** - Horizontal, underground stem.
- Sepals** - The outermost flower structures which usually enclose the outer flower parts in the bud. Collectively they make up the calyx.
- Sessile** – Leaf attached without a petiole; also a spikelet or flower attached without a pedicel.
- Spike** -An inflorescence in which the flowers along the rachis are stalkless.
- Spikelet** – Basic flowering unit of the grass plant. Includes two basal glumes plus one to several florets that lie between.
- Stamen** – The male part of a flower that produces the pollen; composed of anther and filament.
- Stipule** - An appendage, usually paired, at the junction of the leaves and stem nodes of some species; may be leaf-like or modified into a spine or sticker.
- Stolon** - A stem that grows horizontally along the ground surface.
- Tendrils** - A thread-shaped extension of the leaf used for climbing.
- Umbel** - An inflorescence in which the flower units are arranged flat or umbrella-shaped.
- Unifoliate leaf** - Simple leaf with a single blade; often found only at the first node above the cotyledons on plants with compound leaves (as in most legumes).
- Veins** -Thread-like structures containing the vascular bundles within leaves and petals.
- Venation** - The pattern or orientation of veins on a leaf.

## Glossary of Descriptive Terms

- Alternate** - One leaf at a node.
- Annual** - A plant which completes its life cycle in one year and then dies.
- Awned** - Having awns or “beards”.
- Axillary** - Produced at the junction of the leaf and stem.
- Basal** - Situated at the base of the plant near the ground.
- Biennial** - A plant which completes its life cycle within two years and then dies
- Compound leaf** - A leaf that is divided into two or more leaflets.
- Cylindrical** - Roller-like with straight sides and ends that are equal, parallel circles.
- Decumbent** - Prostrate at the base but ascending at the ends.
- Dehiscent** – Dry fruit, splitting open at maturity.
- Digitate** - Fingered; compound with parts radiating from the apex of support.
- Diocious** - Unisexual, the male and female kinds of flowers on separate plants.
- Entire** - Without any kind of teeth or lobes.
- Glabrous** - Without hairs, usually smooth.
- Lanceolate** - Lance-like; several times longer than wide and narrow at the tip.
- Lateral** - Relating to the side.
- Linear** - Several or many times longer than wide, with parallel margins
- Lobed** - Divided into rounded segments with the recesses extending about half way to the midrib.
- Longitudinal** - Running lengthwise.
- Marginal** - Entered in the margin or border.
- Oblong** - Longer than broad.
- Opposite** - Two leaves at a node.
- Ovate** - Egg-shaped, with the broad end nearest the attachment.
- Palmate** – In a pattern that radiates from a central point (like fingers on the palm of your hand)
- Palmate trifoliolate** – All three leaflets originate from the same point at the tip of the petiole.
- Parallel** - Occurring at equal distance apart. Parallel venation has leaf veins parallel to each other.
- Perennial** - Plant which lives more than two years.
- Pinnate** – In a pattern that projects from both sides of a central axis (like a feather)
- Pinnate trifoliolate** - Three leaflets originate at different points from the end of the petiole.
- Prostrate** - Lying flat on the ground.
- Pubescent** - Covered with hairs.
- Rosette** - A cluster of spreading or radiating basal leaves.
- Serrate** - Having sharp teeth pointing forward.
- Sessile** - Without a stalk of any kind.
- Simple leaf** - A leaf that is not subdivided into leaflets. Not compound.
- Spatulate** - Shaped like the tip of a spatula.
- Spherical** - Round, globe shape.
- Succulent** - Soft and juicy.
- Terminal** - Situated at or forming the extremity or upper bud, flower, or leaf
- Translucent** – Semitransparent; can be partially seen through.
- Trifoliolate** - Having three leaflets (often used interchangeably with **trifoliate**).
- Whorled** - Three or more leaves at a node
- Winter annual** - A plant that germinates in the fall and flowers the following spring or summer.

# ID Hints for Some Important Weeds in Kansas

## **barnyardgrass** *Echinochloa crus-galli*

### Plant

- Annual grass
- Dense, panicle inflorescence with short, stiff branches
- May be awned

### Vegetative

- Folded vernation, flat stem
- Smooth, broad leaves
- No ligule

## **cheat** *Bromus secalinus*

### Plant

- Annual grass
- Heavy drooping panicle with 5-15 florets per spikelet
- Panicle branches stiffer and awns shorter than downy brome
- Very hairy sheath and leaf surface

### Vegetative

- Pubescent stems and leaves
- Membranous ligule
- Sheath and blade dense with hairs
- Leaves have distinct clockwise twist

## **cocklebur** *Xanthium spp.*

### Plant

- Small flowers in composite head in the upper leaf axils
- Male flower bud first appears without spines (common burdock has spines from the start)

### Vegetative

- Cotyledons lanceolate, thick and waxy
- Opposite first true leaves
- Rough stem with black spots
- Rough, sandpapery leaves with a long petiole
- Irregular toothed leaf margin

**common lambsquarters**     *Chenopodium album*

Plant

- Annual
- Green or purple flowers on narrow panicles
- Seed borne in “cauliflower” like clusters

Vegetative

- Cotyledons are long and narrow (spatula shaped)
- Upright, grooved stems, often with striped red color on mature plants
- Leaves are grayish-white on the underside; “Christmas tree” shape
- Often has purplish cast

**common ragweed**     *Ambrosia artemisiifolia*

Plant

- Annual
- Upright, branched stem
- Deeply-lobed, finely divided leaves
- Yellow male flowers in terminal raceme of small drooping heads at top of the plant
- Female flowers in the leaf axis

Vegetative

- Small, spatulate cotyledons
- First true leaves opposite with 5 lobes
- Upright, branched stem with opposite leaves on lower nodes switching to alternate on upper
- Deeply-lobed, finely divided leaves

**curly dock**     *Rumex crispus*

Plant

- Perennial broadleaf
- Spear-like leaves scattered within the inflorescence
- Papery seedhead with winged pods in dense clusters that turn reddish-brown at maturity

Vegetative

- Regrows from crown on top of large, woody taproot
- Leaves in a rosette, broad, lance-shaped, crinkled edges
- Leaf blade comes to distinct sharp stop at petiole; do not taper off like sugarbeet

**downy brome**     *Bromus tectorum*

Plant

- Annual grass
- Soft, drooping panicle
- Spikelets slender with very long, thin awns; awns much longer than cheat

Vegetative

- Pubescent stems and leaves
- Membranous ligule
- Sheath and blade dense with hairs
- First true leaf long and narrow
- Leaves have distinct clockwise twist

**eastern black nightshade**     *Solanum ptychanum*

Plant

- Annual
- Erect, widely branched stems
- Tiny, “tinker-bell”, white flowers
- Flower branches attached at leafless node
- Round, black berries when mature

Vegetative

- Shiny, smooth green leaves
- Stems and bottom of leaves often with purple coloration

**field bindweed**     *Convolvulus arvensis*

Plant

- Perennial with rhizomes
- Trumpet-shaped white to pink flowers; flowers smaller than hedge bindweed
- Bracts on the flower stalk (pedicel) about half way down to the stem

Vegetative

- Kidney-shaped cotyledons
- Alternate first true leaves
- Vine-like growth habit
- Spade-shaped leaves that are parallel to stem
- Pointed bases of leaf blade curve inward, vs field bindweed that curve and point outward

**giant foxtail**     *Setaria faberi*

Plant

- Annual
- Bushy compact panicle with seeds unorganized like green foxtail, but more separated

Vegetative

- Wide blade with peach fuzz hairs across entire surface of leaf blade (green is clean)
- Short hairy ligule
- Row of hairs along edges of leaf sheath visible as it is pulled back (green foxtail also has this)

**giant ragweed**     *Ambrosia trifida*

Plant

- Annual
- Yellow male flowers in terminal raceme of drooping heads at the top of the plant
- Female flowers in the leaf axis below
- Flowering structures coarser and more robust than common ragweed

Vegetative

- Seedling with spatulate cotyledons and opposite first true leaves with three lobes
- Serrated leaves usually three-lobed, except near the top of the plant may not be lobed
- Leaves are opposite on most nodes, except occasionally alternate at very top

**green foxtail**     *Setaria viridis*

Plant

- Annual grass
- Dense, cylindrical panicle with 1-3 bristles per spikelet
- Seeds smaller and arranged randomly within head compared to yellow foxtail in rows

Vegetative

- Round stem
- Hairy ligule
- Leaves without hairs on upper blade surface compared to giant foxtail with fine hairs
- Fine row of hairs on margin of sheath

**horseweed (marestail)**     *Erigeron canadensis*

Plant

- Winter annual or summer annual (overwinters in rosette form if emerges in fall)
- Panicle inflorescence that resembles a Christmas tree

Vegetative

- Stems 2-4 feet tall; stiff and unbranched at the base, slightly branched at top
- Stem with densely packed leaves looks like a tail (thus also called marestail)
- Leaves lance shaped, with a few slight lobes (vs. smooth margins on kochia)
- Leaves covered with scattered hairs (vs. shorter, fuzzy hairs on kochia)

**henbit**      *Lamium amplexicaule*

Plant

- Winter annual
- Purple flowers in axils of very lobed leaves
- Often found in fallow fields making a pretty purple blanket in early spring; flowers very early

Vegetative

- Opposite leaves on square stems; rippled lobes on edges with deep veins
- Leaves sessile on upper stems, petioled at base in early growth stages

**jimsonweed**      *Datura stramonium*

Plant

- Annual
- Large, trumpet-shaped flower
- Huge, pointed calyx tube covers flower bud until petals emerge
- Spiny seed pods with distinct flat, flanged base

Vegetative

- Linear cotyledons; large with prominent, recessed midvein
- Alternate first true leaves
- Unpleasant odor
- Sturdy, erect stem
- Large, flat, lobed or toothed, glabrous leaves

**johnsongrass**      *Sorghum halepense*

Plant

- Perennial with rhizomes
- Typical sorghum head with paired fertile and sterile spikelets
- Large, purplish, hairy, open panicle
- Thinner stem and panicle branches than sudangrass

Vegetative

- Seedling looks very much like grain sorghum or shattercane; pull up and find seed to help identify
- Glabrous throughout entire plant
- Broad leaf blade with prominent white midrib
- Sheath may be covered with white mealy “bloom” that rubs off when touched

**kochia**      *Bassia scoparia* (changed from *Kochia scoparia*)

Plant

- Annual
- Flowers greenish, changing to red when ripe
- Single flowers and seed pods borne in the leaf axil

Vegetative

- Small linear cotyledons
- First true leaves opposite
- Red to violet underside of leaves with frosty appearance above
- True leaves and stems hairy, stems can be red at maturity
- Erect and freely branching stems (tumbleweed appearance when mature)
- Alternate, simple, narrow leaves with fine peach fuzz hairs
- Leaves longer at the base of stems (2-3 inches), but decrease to 1/2 inch or less at top of plant

**large crabgrass**      *Digitaria sanguinalis*

Plant

- Annual grass
- 3 or more digitate spikes per stem
- Single seeded spikelets lay flat, alternating along one side of rachis
- Mid vein of rachis weaves back and forth (versus straight in bermudagrass or goosegrass)

Vegetative

- Rounded first true leaf held very flat
- Large membranous ligule
- Bristle-brush hairy sheath and stem, stems decumbent

**morningglory**      *Ipomoea spp.*

Plant

- Annual
- Large trumpet-like flower borne solitary at leaf axils
- Multiple species with slightly different cotyledons, leaf shapes and flower color
- Most common in Kansas are ivyleaf morningglory, tall morningglory and pitted morningglory

Vegetative

- Butterfly shaped cotyledons
- Alternate first true leaves
- Vine-like growth habit
- Heart-shaped leaves
- Very hairy stem and leaves on tall and ivyleaf types

**musk thistle**      *Carduus nutans*

Plant

- Biennial
- Spiny bracts on broad, flat inflorescence
- Head larger and flatter than Canada thistle, with bright pink petals

Vegetative

- Glabrous leaves (no hairs)
- Leaves not as spiny as bull thistle but more than Canada thistle
- Leaf blade with distinct white outline around the edge of leaf

**Palmer amaranth**      *Amaranthus palmeri*

Plant

- Annual
- Dioecious – male inflorescences are smooth, females are spiny
- Much variation among ecotypes (for leaf shapes, color, watermarks, density of inflorescence)
- Inflorescence very elongated compared to clumpy appearance of redroot pigweed

Vegetative

- Lanceolate cotyledons with alternate first true leaves
- Leaves with broad, oval shaped blades and long petioles (equal or longer than blade)
- Glabrous throughout compared to redroot pigweed with fine hairs on upper stem and petioles
- Leaf blades broad and more oval shape compared to tall waterhemp with narrower leaf blades

**prickly sida**      *Sida spinosa*

Plant

- Annual
- Stems erect, branching widely, covered with soft hairs
- Flowers with 5 pale yellow petals found in leaf axils

Vegetative

- Round cotyledons with slight “nick” in tip
- Alternate first true leaf
- Sessile appearance of serrated first true leaf
- 2 to 3 spiny projections below each node
- Alternate, oblong leaves with toothed edges

**redroot pigweed**      *Amaranthus retroflexus*

Plant

- Annual
- Flowers in dense cluster head with bristly bracts
- Fine peach fuzz hairs most visible on upper stems

Vegetative

- Lanceolate cotyledons with distinct “nick” in the tip and in distinct midvein
- Alternate first true leaves
- Rough texture on leaf surface compared to glossy finish on other pigweeds
- Upright, very hairy pubescent stem and petioles outside of apical bud area
- Some other pigweeds can have pubescent apical bud; so hairs only at the apical bud does not automatically mean redroot pigweed - look to see if hairs continue on rest of stem and petioles

**shepherdspurse**      *Capsella bursa-pastoris*

Plant

- Winter annual from mustard family
- White flowers on long racemes from several branches at the top of the stem
- Fruit is distinct triangular in shape, looks sort of like a purse

Vegetative

- Rosette in fall with elongated leaves that may range from gently to deeply lobed
- Clasping leaves with no petiole
- Upper surface of leaf has very short, scattered, white shiny hairs

**tall waterhemp**      *Amaranthus tuberculatus*

Plant

- Annual
- Dioecious growth habit (separate male and female plants)
- Elongated, slender inflorescence compared to dense clumpy inflorescence of redroot pigweed (males smooth, females spiny)

Vegetative

- Lanceolate cotyledons with in distinct mid-vein
- Alternate first true leaves
- Can have reddish appearance
- Glabrous stem and leaves (apical bud may have a small amount of pubescence)
- Leaf blades narrower than Palmer amaranth and very smooth and shiny
- Leaf petioles generally shorter than the blade versus Palmer amaranth with longer petioles

**velvetleaf**     *Abutilon theophrasti*

Plant

- Annual
- Orange-yellow flowers
- Seed in hairy, beaked capsules arranged in a disk

Vegetative

- Round cotyledons with velvety appearance
- Alternate first true leaves, heart-shaped with short hairs and some serration
- Tall, erect, velvety stems
- Simple, rounded, pointed, velvety leaves

**Venice mallow**     *Hibiscus trionum*

Plant

- Annual
- Pale yellow to white flowers often with a purple center
- Hairy seed capsule with thin outer pericarp wall

Vegetative

- Heart-shaped cotyledons
- Alternate unlobed box-shaped first true leaf on long petiole; later leaves start showing lobes
- Erect, spreading hairy stem
- Alternate, irregularly shaped and distinct three-lobed leaves

**wild buckwheat**     *Polygonum convolulus*

Plant

- Annual
- Multiple flowers and seeds borne directly or on short stalks at leaf axils
- Green flowers; scaly green sepals cover and clasp tightly around each triangular seed
- Delicate ocrea at nodes

Vegetative

- Lanceolate cotyledons
- Alternate, heart-shaped first true leaves
- Vine-like stems with ocrea at axillary buds
- Arrow-shaped leaves with pointed tip and pointed basal lobes; more triangular versus arrowhead shape of bindweeds; basal leaf lobes point inward versus outward on bindweeds

**wild sunflower**      *Helianthus annuus*

Plant

- Annual
- Simple, rough, serrated leaves
- Rough stem with scattered short hairs
- Flowers are daisy-like with yellow rays and brown disk flowers in center

Vegetative

- First 3-4 lower nodes with opposite leaves, then switches to alternate
- Rough, sandpaper like leaves often with irregular serrated margins
- Stems covered with short, scattered white hairs (versus black specks on cocklebur)

**yellow foxtail**      *Setaria pumila*

Plant

- Annual grass
- Dense panicle with 5 or more bristles per spikelet
- Seeds larger and arranged in neat rows compared to green foxtail

Vegetative

- Hairy ligule
- Flat stem
- Long hairs at the base of the leaf blade near the collar
- Upper portion of leaf blade and sheath glabrous

**yellow nutsedge**      *Cyperus esculentus*

Plant

- Perennial growth habit with tubers
- Yellowish-brown, “bushy” flowers sit in nest of three-ranked leaves.
- Maturing plants look like fireworks exploding.

Vegetative

- Triangular stem with leaves emerging in three directions (three-ranked)
- No ligule (not a grass)
- Shiny, thickened leaves

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