Or, “How to Get Weeds Out of Your Hair”
What is a weed? An unwanted plant; a plant out of place. Competes for water, nutrients, light and space.
Weeds

- Compete for water, nutrients, light and space
- Reduce yields
- Increase mowing costs
- Spoil beauty

Why weeds are a problem, 1
Why weeds are a problem, 2

Toxic weeds include poison ivy, poison hemlock. Can also throw in allergens, like ragweed.
To identify weeds, need to know:

- Type
- Life Cycle
- Season of bloom

Classifying weeds by type, life cycle, and season of bloom
Grasses: Have only one leaf as they emerge (monocotyledon)
Have parallel leaf veination; Most have fibrous root system; growing point is sheathed and located below ground
Stems can be rolled (left) or folded (right)
General parts of grass plant: blade, stem encased in sheath.
Auricles: Projections from sides of the collar. Can be clasping, long/claw-like, short, or absent
Leaf collar: where the blade and sheath join. Usually lighter in color. Can be broad, narrow, divided.
Ligules: membrane-like tissue or row of delicate hairs typically found in grasses at the junction of the leaf sheath and blade. Can be absent, tall, short, membranous, hairy, etc.
Broadleaf: two cotyledons (seed leaves) as germinate netlike veination; usually taproot; exposed growing point
Sedge: similar to, and often mistaken for, grasses.

**Triangular stems:** three rows of leaves.
Mostly found in wet areas.
eg. yellow nutsedge
Life cycle chart: Summer and winter annuals, biennials, perennials.
Annual weeds live for less than one year.
Summer annuals germinate in spring; grow, mature, produce seed and die before winter.
Examples of summer annuals
Winter annuals germinate in fall; grow, mature, produce seed, die before spring (summer)
Examples of winter annuals
Biennial
• Lives for 2 years
• Reproduces by seeds
• Year 1 – develops rosette of leaves
• Year 2 – flowers, seeds and dies

Biennial life cycle. Example: Queen Anne’s lace, mullein
Perennials:  Top: Curled Dock: yellow taproot
Bottom: Bermudagrass: extensive stolon system from a single plant
Simple Perennials

• Normally reproduce by seeds
• However, root pieces left by cultivation can produce new plants
• eg... dandelions, buckhorn plantain, some trees and shrubs

Simple perennials (not spreading)
Creeping perennials are the hardest to control because they reproduce not only from seed, but from rhizomes or stolons also.
Weeds can be classified by the Growing Season: when do they grow the best?
Cool season plants (annual bluegrass, chickweed, dandelion) grow best in spring and fall.
Warm season weeds (crabgrass, spurge, Bermudagrass) grow best in summer.
Weed Identification

• Annual Grass Weeds
• Perennial Grass Weeds
• Annual Broadleaf Weeds
• Perennial Broadleaf Weeds
• Miscellaneous Weeds

Weed identification: Will only look at a few common weeds. Look at various weed guides, pubs.


Plant Conservation Alliance Alien Plant Invaders: https://www.nps.gov/plants/alien/factmain.htm

Lawn Weeds and Environmental Indicators: http://kentcoopextension.blogspot.com/2007/08/ornamentals-hotline-weed-pictures-for.html (good for describing soil and management problems that lead to weeds)

Weed Identification: http://weeds.cropsci.illinois.edu/weedid.htm

Annual grass weeds
Crabgrass: Most common grass weed. Prostrate growth habit, often roots where nodes touch ground.
Seeds on spiky inflorescences, about 3-10 segments at top of stem
Germinates in March/April, approx. time when Forsythia blooms. Blooms late summer (August).
Needs sunlight for germination and early growth, so best control is thick lawn. Mow high, water and fertilize properly.
Goosegrass:
Sometimes confused with crabgrass, but is darker green and grows in tufts.
Can grow upright, but usually grows prostrate. Note white color of lower stems. Forms tough, wiry rosette.
Inflorescences finger-like, similar to crabgrass but thicker.
Annual bluegrass: *Poa annua*
Found in lawns and gardens, especially those with moist, rich soil.
Leaves a soft, light green. Germinates early, forming dense patches.
When weather begins to warm, will produce abundant short, pyramid-shaped panicles, white in color (lawn turns white). Lawn fades away as seeds develop.
Perennial Grass Weeds
Bermudagrass
Spreads by both rhizomes and stolons, producing heavy sod. Very invasive.
Flowering stems upright, 3 to 7 fingers in spikes.
Warm season grass, grows well in hot, dry summers. Turns brown with cold weather. Doesn’t like shade.
Blades short and narrow.
Tall fescue:
Dense, upright growing clump, often seen growing in bluegrass lawns.
Blades coarse textured, between $\frac{1}{4}$ and $\frac{1}{2}$ inch wide.
Annual broadleaf weeds
Chickweed
Winter annual: germinates in late winter/early spring; blooms, seeds and dies before hot weather comes.
Henbit: Mint family (square stems)
Early spring (winter annual).
Opposite leaves: lower leaves have petiole, upper leaves have no petiole. Flowers purple, surrounded at base by calyx.
Found in gardens, cultivated fields, waste places, especially areas with rich soil.
Purple dead-nettle: Mint family (square stems). Closely related to henbit. Early spring (winter annual). All leaves have petioles. Upper leaves reddish-purple in color.
Prostrate Spurge (warm season)

Prostrate spurge:
Stems prostrate, forms a mat. Cut stem releases white, milky sap; irritating to skin.
Leaves are hairy. Often have a purple splotch on upper surface.
Found in gardens, lawns.
Knotweed
Prostrate and erect species.
Stems bluish green, wiry. Each node covered with a papery sheath.
Forms dense green mats.
Found in **compacted soil.** Found in lawns, along pathways, roadways, waste areas.
Lespedeza is a legume; summer annual. Found in dry, low-fertility soils. Very difficult to control with standard broadleaf mixtures.
Perennial broadleaf weeds
White clover is a perennial with creeping stems rooting at some nodes. Leaves have three leaflets with a long erect petiole. The flowering heads are borne on long stalks arising from the stems and usually rise above the leaves. The flower cluster may be ½ to 1½ inches in diameter. The petals are white or occasionally tinged with pink. Clover is a legume, and will fix its own nitrogen through the nodules on the roots (left). Usually appears in N-deficient soils.
Dandelion
Common weed, found in lawns, meadows, gardens, waste areas.
Stem is a tight crown, never elongates, producing a rosette of leaves. Leaves can be lobed, containing milky sap.
Flower heads yellow, borne on long, hollow stalks.
Has thick, fleshy tap root; new sprouts can come from root or root segments.
Wild violets are winter annual or perennial weeds that often grow in clumps. The plants form rhizomes that support heart-shaped leaves. The flowers of wild violet have five petals and are usually purple, but can also be white or yellow. The flowers usually appear in early spring and summer, and the plants are most often found in shady habitats.
Ground Ivy, Creeping Charlie
Rounded, scalloped-edged leaves, heavily veined. Square stems.
Small purplish flowers.
Prostrate, roots at nodes.
Found in lawns, orchards, waste areas, **especially shady areas with damp, rich soil.**
The reason these weeds are so difficult to control is because they grow in the shade, where most grasses won’t grow. Even if you kill off the weeds with herbicide, they’ll eventually come back, because Nature hates a vacuum.
Canada thistle: Noxious weed!
Leaves with crinkled edges and spiny margins.
Roots extend several feet deep and some distance horizontally, will sprout up from extending roots.
Found everywhere.
Plantain: Broadleaf on left, buckhorn on right.
Leaves at basal rosette, flowers on stalks.
Found in lawns, meadows, pastures, waste areas.
Poison ivy  
3-leaflet compound leaf, alternate leaf arrangement.  
Look-alike: boxelder seedlings. These leaves are opposite!  
Poison ivy very variable: leaves can be toothed or smooth, shiny or dull. Can grow as groundcover, or as vine. Has white berries, edible for birds.  
Contains toxic oil that causes allergic reactions in many people. Danger: beautiful fall color, kids collect and get rash.  
Found in open woods, fence rows, thickets, under trees, in shrub beds.  
Woody perennial, very hard to control.
Miscellaneous weeds
Wild garlic; often mistakenly called wild onion
Reproduces by seed, aerial bulblets, and underground bulblets.
Leaves slender, hollow, and waxy. Need a surfactant to get herbicide to stick.
Cool season weed, often found in weak, thin lawns (especially zoysia grass).
Star of Bethlehem: looks like wild garlic, especially before it begins to bloom. Has small bulblets, like wild garlic. Leaves have no odor.
Highly toxic plant, little children think it’s wild onions and eat it.
Either educate children about eating things, or kill it the same way as with wild garlic.
Yellow Nutsedge
Not a grass, although looks like one. Note triangular stem.
Reproduces by seed and tubers. Spreads by rhizomes.
Stems and leaves erect, yellow-green. Grows faster than turf, so becomes noticeable.
Found primarily on low, damp soils, especially in lawns.
Control is very difficult: few chemicals, timing is critical, takes multiple years because of tubers.
Leaves upright and waxy, needs surfactant
Parasitic weed: Lives on host plants, Obtain nutrients from host plant. Can stunt or kill host. Reproduce by seed; spread plant to plant by vining and twining. Control with pre-emergent herbicide; hand-pulling.
Algae
Slimy growth, occurs on bare soil, driveways, etc., in places where there is shade and lots of water. Weak weed, doesn’t kill off grass, just grows where grass won’t. When dry, is black, crusty material. Control with copper sulfate (staining!), but must improve site.
Controlling Weeds

- Weed control strategy designed to suppress infestation
- Have to take advantage of differences between weeds and desired plant

Weed control strategy
Weed prevention: Weed plants can produce enormous numbers of seeds each year, and seeds can last many years in soil.
Weed control strategy

Control by not allowing plant to seed!
Hand pulling is inexpensive. OK for small weeds, or small gardens. Difficult for older, embedded perennial weeds. A real pain (literally) for large gardens.

Also, not recommended for poisonous weeds, like poison ivy.
Cultural control in the home
Mulch works by shading seeds.
Seeds contain food reserves to help embryo reach sunlight for photosynthesis.
Some seeds so tiny, won’t survive to reach sun if buried, so need light exposure.
Mulch blocks light, prevents weed seeds from germinating or reaching sunlight.
Mulch should be 3 to 4 inches deep (avoid mulch volcanoes).
Anything can be used for mulch, including bark, wood chips, straw, grass clippings, rock....
Mulch materials:
Organic (leaves, etc.);
Plastic: black plastic warms soil; red and other colors may help some crops. Avoid clear plastic, acts like mini-greenhouse for weeds
Newspaper: 3 to 4 sheets. Place rocks, small amount of soil, or organic mulch on top to prevent blowing. Till into garden at end of season.
Weed control barriers, like landscape fabric, are sometimes used when INORGANIC mulches, like rock, are used. This prevents the rock from sinking into the soil, and helps with preventing weeds from germinating from soil. Weed seeds that blow into mulch are easy to pull out, since they can’t reach the soil to embed themselves.

Do not use for organic mulches, like wood chips. We WANT these to degrade and mix with the soil to add organic matter. Also, wood chips more likely to float away if laying on weed barrier. Cardboard, newspaper, etc., can also be laid under mulch. Eventually rots and adds to soil organic matter.

Problem: If mulch disturbed by raking, foot traffic, fabric can be exposed. Also, if fabric is not overlapped properly, weeds can emerge between pieces.
Mulch failure: Weeds can still occur in mulched beds because:

- Mulch layer wasn’t thick enough to stop weed growth.
- Mulch layer degraded and became thinner.
- Weed seeds blew into the bed, on top of the mulch, and germinated.
- Mulching won’t stop perennials, which have more energy to reach surface than tiny weed seeds.
Plastic mulch doesn’t allow water through, so must remember to install soaker hoses first. Also, breaks down in sunlight, and becomes waste disposal mess.
Hoeing: hand cultivation.

Use SHARP hoe, and shave weeds off at surface. Great for annual weeds, although perennial weeds will grow back from roots.

Avoid digging deeply: can cut crop roots, bring more weed seeds to surface.
Cultivating: Dig up weeds with tiller. Easy, breaks up soil. Can damage roots of garden plants.
Cultivating deeply breaks soil crust, allows weed seeds to germinate. Hey, we’ve got this hard clay, might as well enjoy it!
Cultural Weed Control in Lawn

- Mow tall (3 inches minimum)
- Mow frequently
- Maintain a dense lawn with proper fertilizing and watering
- Select the best turfgrass for the site
- Do not try to grow grass in locations with too much shade
- Control thatch and core aerate
A good, thick lawn is usually your best weed control. Weeds have a tough time competing against a thick lawn.
Low mowing increases crabgrass, since crabgrass needs lots of sunlight to germinate and get started. Mowing high reduces crabgrass problems.
Green Dragon™ weed control, plus other homemade fire devices. Burning is DANGEROUS to applicator, property, and home. Probably violates clean air laws, too. Plus, only kills annual weeds; perennials will simply sprout back from roots, which weren’t cooked.
Timing of herbicide application: before the weed seeds germinate (pre-emergence), or after the weeds have emerged and are growing (post-emergence).
Pre-emergence herbicide: applied before weed seedlings emerge from the soil. Used for preventing weeds from appearing in lawns, flower gardens, etc. Most commonly used for annual weeds.
How preemergent herbicide works: Forms a chemical barrier that germinating seedlings must pass through, which kills them. If there are gaps in barrier (aeration, missed, too much rain), seeds can germinate without being harmed. Preemergent herbicide must be applied before crabgrass germinates (March).
Timing of Herbicides

• **Postemergence Herbicide – Definition**
  – Applied to weeds after they have emerged from the soil

• **Postemergence Herbicide – Uses**
  – To control existing weeds in lawn and garden planting situations
  – Used for annual, perennial, broadleaf and grass weeds

Postemergence herbicide: applied to weeds after they’ve emerged from soil. Used for controlling existing weeds in lawns, gardens.
Herbicides: Contact vs. Translocated or systemic.
Contact herbicides: affect only parts of the plant it contacts. Poor coverage means poor control. Used for killing annual weeds quickly. Examples: herbicidal “soap,” vinegar.
Translocated herbicide: Taken into the plant moved throughout it. Used for killing perennials, deep rooted plants, and other difficult-to-kill weeds.
Herbicides: Selective vs. non-selective
Selective herbicide: controls a particular pest without harming related organisms. Used for killing broadleaf weeds in lawns, grassy weeds in ornamental beds, or annual weeds in a perennial lawn or bed.
Non-selective herbicide: Controls nearly all related organisms. Used for killing all plants in non-plant areas (like weeds in driveway). Can be used as a directed spray around desired plants if no selective treatment is available (ex: spraying around tree trunk with Roundup)
Chemical control for vegetable gardens.

- Selective preemergence herbicides
  - eg. Preen, Treflan, Dacthal

- Proper Usage
  - Read & follow label directions

- Remember: wide variety of vegetables in the garden, easy to damage non-target crops.
Chemical control in turf:
Annual grasses (crabgrass) – preemergent herbicides, proper timing important
Perennial grasses: non-selective herbicides as a spot treatment
Broadleaf weeds: selective postemergent herbicides
Lawn Recommendations

- **Broadleaf Weeds (Postemergence)**
  - Growth regulators
    - 2,4-D; MCPP; dicamba
  - “Three-way” herbicides ("Trimec")
  - Avoid drift to desired trees, shrubs and food plants!
  - For more information, consult Purdue publication AY-9

Broadleaf post-emergent products for lawns: growth regulators, 3-way products to kill a wide range of weeds; Triclopyr for hard to control weeds.
Lawn Recommendations

- Annual Grass Weeds (crabgrass) (Preemergence)
  - Synthetic Products – Benefin, Benefin/Trifluralin, Dithiopyr, Pendimethalin, Prodiamine
  - Natural Products - Corn gluten?
  - For more information, consult Purdue publication AY-10

Controlling annual grasses in lawns – synthetic products. Corn gluten: organic, not practical because need 20 pounds gluten per 1000 sq. ft. to control crabgrass...which provides 2 pounds of N / 1000 sq. ft. at time of year when shouldn’t be fertilizing!
Lawn Recommendations

- **Difficult broadleaf weeds**
  - Triclopyr and clopyralid are more effective on difficult to control weeds like wild violet, oxalis, lespezeza
  - Brand XYZ Chickweed, Clover and Oxalis Killer
  - Will require multiple applications

Controlling difficult broadleaf weeds, like violet.
Lawn Recommendations

- **Perennial Grass Weeds (Postemergence)**
  - No selective control available
  - Must use non-selective product to kill the weed and turf and then replant the area
  - Example: glyphosate (Roundup, etc.)
  - For more information, consult Purdue publication AY-11

Controlling perennial grassy weeds in lawns: No selective controls available.
Lawn Recommendations

• Yellow Nutsedge (Postemergence)
  – Halosulfuron: SedgeHammer
  – Sulfentrazone: Ortho Nutsedge Killer for Lawns

  – Other products available for home gardeners, but not as effective.
  – See AY-19, “Yellow Nutsedge Control”

Controlling yellow nutsedge.
Apply in early May, just as first nutsedge leaves are appearing. Follow up 4 to 6 weeks later with second application, according to label directions. Will require up to 3 years to kill off all nutlets.
Weed Control on New Lawns

- Newly emerged grass plants are very sensitive to chemicals.
- Do not apply any herbicides until lawn has been mowed 3 - 4 times (check the label).

Weed control on new lawns: don’t!
Ornamental Plant Recommendations

• To prevent annual weeds in labeled tree, shrub, flower and/or ground cover plantings
  – Trifluralin (Preen, Treflan, etc.)
  – Eptam (Preen for Groundcovers, EPTC, etc.)
  – Oryzalin (Monterey Weed Stopper, Surflan, etc.)
  – Benefin (or Balan) + Surflan = Green Light Amaze

Pre-emergent control of annual weeds in ornamental beds
Ornamental Plant Recommendations

- To kill existing annual and perennial grass weeds in labeled tree, shrub, flower and/or ground cover plantings
  - Fluazifop-P-butyl (Fusilade, Grass-B-Gon, etc.)
  - Sethoxydim (Poast)

Post emergent control of grass in ornamental beds
Ornamental Plant Recommendations

- To kill existing broadleaf weeds in labeled tree, shrub, flower and/or ground cover plantings
  - No selective control available
  - Must use non-selective product as a spot treatment to kill the weed; avoid contact with desirable plants
  - Example: glyphosate (Roundup, etc.)

Post emergent control of broadleaf weeds in ornamental beds
Non crop areas, such as driveways, patios, ditches.
Problems with use of soil sterilant: runoff from treated driveways into nearby lawns and gardens. If treating fenceline, any tree roots under it will pick up enough chemical to kill tree, even if tree 50 feet away!
Caution: read the label!
Many chemicals with similar brand names, can be confusing.
Many different concentrations, different weeds on label, different sites.
Roundup Extended release has other chemicals added for long-term control, can’t be used around living plants.
Seven different types of Weed-Be-Gone.
Ya can’t beat concrete!

Concrete’s many green benefits make it the sustainable choice.

Best weed control: concrete!
Yet life always finds a way....