

When Dealing with Weeds – It Pays to Know your Enemy!

Weeds are simply plants we don't want. Some harm crops or threaten other beneficial plants. Some are just unwanted and unattractive. Most of what we call weeds are aggressive, hardy plants that adapt and thrive so well, they've become invasive and harmful ... or at least a nuisance.

Know Your Enemy - Weeds have their favourite spots and germination conditions. Knowing their habits, the conditions for them to germinate, spread or thrive is a big part of solving the problem.

Weed life cycles can be broken down into five categories:

- Summer annuals - germinate in the spring and the plant sets seed in the summer or fall then dies.
- Winter annuals - germinate during the late summer or early fall. The plant overwinters and produces seed the following spring or early summer.
- Biennials - usually germinate in the spring, and the plant grows and then overwinters. Next spring, the plant re-grows, flowers and produces seed and then dies, leaving its progeny to carry on.
- Perennials - germinate in the spring, then grow, flower and produce seed in the fall. That seed spreads to start new plants, and the 'mother' plant also overwinters and begins the cycle all over again next spring. Perennials produce seed (simple perennials) or spread vegetatively (creeping perennials).

Weeds reproduce in two different ways:

Sexual reproduction - by generating and germinating seed

Asexual reproduction – vegetatively – by stems, runners, stolons....

Sexual/Seeds - When a seed falls in the right conditions, it germinates and grows and develops into a mature plant. Germination requires water, light, oxygen, and appropriate temperature.

Asexual/Vegetative - a node on a creeping stem may root resulting in the production of a new plant. Any broken piece of some plants has the potential to become a new plant. Simple perennials often re-grow if a portion of the taproot is severed.

Timing is important!

The best time to control any weed is while the plant is in its weakest stage - as a youngster; a Seedling. By nipping a plant's reproductive efforts in the bud, we can remove it before it has a chance to set thousands of new plants and make our jobs many times more difficult. By removing plants before seed heads develop or before those difficult-to-remove long and healthy roots have dug in, we are seriously reducing the number of weeds to deal with later. By taking control of seeders and creepers before they've spread throughout our gardens, our weeding efforts will be easier and more successful.

20 Weeds – Know these Enemies!

In the following pages, I have summarized 20 common weeds, their life cycle, conditions for germination or spread along with hints for indentifying the young seedlings. Use this knowledge to form a battle plan to aid in the control of these invaders of our gardens!

1) **Dandelion**, *Taraxacum officinale*

Life Cycle - perennial

Conditions for seed germination and spread

- Reproduce from seeds and short shoots from the taproots.
- Found in meadows, lawns, pastures, roadsides and waste places. They grow more luxuriantly in good or moist soils, flourishing in cultivated gardens

Identifying the Seedlings

- Cotyledons leaves are light-green, smooth, and oval to spatulate in shape.
- Young broadleaf leaves form a basal rosette and are oval to spatulate in shape, tapering to the base, have a green midvein, may show weakly toothed edges and are 6 to 10 cms in length.



2) **Evening Primrose** *Oenothera biennis*

Life Cycle – usually a biennial or a winter annual but may rarely occur as a summer annual.

Conditions for seed germination and spread

- Reproduce by seeds.
- Preferred habitat is gravelly or sandy neglected areas or any well-drained perennial borders and shrub beds.

Identifying the Seedlings

- Cotyledons are 6 to 11 mm long, and usually ovate with a short petiole. The stem at the base of the cotyledons has a reddish tint. Leaves are narrow and initially develop as a basal rosette then progress to alternate and smaller growth up the stem.
- Upper surface of young leaves have a few hairs near the base.
- Mature leaves are elliptic to lanceolate in outline, are relatively narrow, and have untoothed margins. Leaves have a distinctive white or pink midvein and may have wavy margins.



3) Purslane *Portulaca oleracea*

Life Cycle - Summer annual

Conditions for seed germination and spread

- Reproduce primarily by seeds with long seed life
- Thrives in sunny, well-drained soil
- Seeds continue to ripen even after the plant has been pulled up. Cultivated fleshy stems can reroot to form “new” plants
- Germinates in spring when soil temperatures reach about 15°C. Survivors grow rapidly and can produce flowers in a few weeks.



Identifying the Seedlings

- prostrate, succulent annual that often forms a dense mat
- reddish stems originate from a central rooting point, radiating out like spokes of a wheel.
- stems vary in length, commonly up to 30 cms.
- Leaves are stalkless (sessile), oval, smooth, succulent, and shiny, and vary from 1 to 5 cms in length.
- leaves, although generally arranged opposite, may also occur alternately along the stem, particularly near the base.

4) Barnyardgrass *Echinochloa crus-galli*

Life Cycle – summer annual

Conditions for seed germination and spread

- Reproduces by seed, and spreading by rooting at the nodes where they contact the soil.
- Common on moist rich soil especially after application of manure.



Identifying the Seedlings

- One of the few grass weeds in which ligules are absent.
- Seedlings have leaves that are without hairs, auricles, or ligules, and the leaf sheaths are often tinted red or maroon at the base.
- Mature plants have leaves that range from 10 to 50cms in length and may be 5 to 30 mm wide. Leaves have a distinct white midvein that becomes keeled toward the basal portions of the leaf.
- The characteristic absent ligule of barnyard grass helps to distinguish this weed from most other grasses in both the seedling and mature stages of growth.

5) Lamb's Quarters *Chenopodium album*

Life Cycle – summer annual

Conditions for seed germination and spread

- Reproduce by seed.
- Anywhere the soil has been disturbed

Identifying the Seedlings

- Cotyledons are narrowly elliptic, about 1.5 cm long and are dull green above and purple on the lower surface
- Erect, tap rooted plant is covered with varying amounts of a waxy substance that gives it a light green appearance.
- Leaves are simple, arranged alternately and are variable in shape and size. They may be up to 8 cm long. The leaf blades are usually ovate to lanceolate. The margins may or may not be toothed and may appear to be 3-lobed. Occasional specimens have purple-to wine-colored leaf bases.



6) Annual Bluegrass *Poa annua*

Life Cycle - Winter annual

Conditions for seed germination and spread

- Rapid and prolific seeder which can produce viable seed just a few days after pollination.
- Not well adapted to acid soils.
- Thrives best during cool weather and is one of the earliest grasses to grow in the spring.
- Starts germinating in late summer or fall as soil temperatures fall below 21°C. It continues to germinate throughout winter.
- Common in gardens, lawns, along pasture roads and in areas where heavy trampling keeps down taller growing species.



Identifying the Seedlings

- Annual bluegrass grows 15 to 20 cms high when left unmowed. It has light green flattened stems that are bent at the base and often rooted at the lower stem joint.
- Leaf blades are often crinkled part way down and vary from 3 to 8 cms long with typical Poa boat-shaped leaf tips.
- Fairly weak and shallow root system that needs frequent rainfall or irrigation to survive. It grows well in moist areas in partial shade to full sun and tolerates compacted soil conditions.

7) Chickweed *Stellaria media*

Life Cycle - Winter annual

Conditions for seed germination and spread

- Reproduced by seed. Hoed plants will also root again in moist soil.
- Common in gardens, lawns and pastures especially in disturbed soil.
- Thrives in shady locations on richer soil, especially after application of manure. Shade tolerance allows it to thrive under other plants.
- Thrives on all but acid soils but more abundant on lighter soils and is an indicator of high nitrogen and low phosphate and lime levels.
- Grows best in cool, humid conditions and is sensitive to drought.

Identifying the Seedlings

- Prostrate growth habit, forming a dense mat
- Cotyledons are ovate, 1-12 mm long by 0.25-2 mm wide, with a slender reddish hypocotyl that is sparsely hairy.
- Leaves arranged oppositely. Leaf shape is oval or elliptic in outline. Leaves light green in color and mainly smooth. Upper leaves are without petioles (sessile), while lower leaves have long petioles.



8) Mouse-eared Hawkweed *Hieracium pilosella*

Life Cycle - perennial

Conditions for seed germination and spread

- Reproduces by seed and leafy runners.
- Does well on dry soils low in nutrients and is considered an indicator of light or poor soils, poor fertility and over-grazing.
- Commonly in evidence in fertility stressed lawns, old pastures, bare slopes and waste places, especially on slopes where soil is dry.
- Not common in damp or shady areas.



Identifying the Seedlings

- Leaves are elliptic, rosette, 2.5-10 cm long, covered in long white hairs and have a white vein down the middle.
- Flower stalks are long, leafless, and covered in stiff dark hairs.
- Stolons grow up to 30 cm long, are sometimes branched and usually have a rooting, terminal rosette of overwintering leaves.

9) **Tansy ragwort** *Senecia jacobaea*

Life Cycle - biennial

Conditions for seed germination and spread

- Reproduces by seed
- Favours undisturbed soils

Identifying the Seedlings

- Spends the first year in the rosette stage with dark green basal leaves that appear ruffled.
- In second year, one or two flowering stems emerge.
- Leaves are twice divided, with petioles on leaves near the base and without petioles toward stem tips. First year leaves in a basal clump (rosette). Second year leaves are alternate along the stem, 5 to 20 cms inches long by 3 to 5 cms inches wide.



10) **Sheep Sorrel** *Rumex acetosella*

Life Cycle - perennial

Conditions for seed germination and spread

- Reproduces by numerous seeds and fine, creeping rootstocks. Can re-grow from root pieces left behind by weeder.
- Found in strawberry fields, orchards, road sides, cultivated land, perennial gardens, and barrens. It grows where competition from other plants is lacking.
- Indicator of acidic soil and the need for addition of lime.
- Can also cope with neutral or slightly alkaline soil, especially if these soils are low in nitrogen.

Identifying the Seedlings

- Leaves are simple, slightly more than 3 cm in length, and smooth with a pair of horizontal lobes at base.
- Leaves are green arrowhead-shaped with red-tinted deeply ridged stems
- Leaves sprout from an aggressive rhizome
- Flowers emerge from a tall, upright stem. Female flowers are maroon in color.



11) Field Bindweed *Convolvulus arvensis*

Life Cycle - perennial

Conditions for seed germination and spread

- Spreads rapidly by seed and creeping roots underground.
- Thrives in any conditions but of course loves loose soil to either set seed in or work its nasty little roots through.
- Particularly troublesome weed in fields, orchards, vineyards and ornamental gardens.

Identifying the Seedlings

- Cotyledons opposite, round and notched at the end
- Stems slender, Smooth or pubescent or very finely hairy, usually twining, prostrate or climbing on any nearby object
- Leaves alternate (1 per node) with short or long stalks, variable in form but commonly arrowhead-shaped with 2 basal lobes and smooth margins, sometimes long and narrow, or broader and nearly round except for the 2 basal lobes, stalkless, absence of an ocrea (membranous sheath) surrounding the stem at the base of each leafstalk.
- An extensively spreading and very persistent, whitish underground root system.



12) Creeping Charlie *Glechoma hederacea*

Life Cycle - Perennial

Conditions for seed Germination and spread

- Although the plant produces seeds, the principle method of reproduction is vegetative by way of creeping stems.
- Loves mulch and loose soil but also creeps very effectively through other vegetation especially turf grass.
- Grows in waste ground and along roadsides near dwellings, spreading into gardens and lawns.
- Grows rapidly and gets established early in early spring
- Favours shady areas around buildings and under trees, where it forms large patches.

Identifying the Seedlings

- Seedlings are seldom observed. Leaves on young shoots are opposite (2 leaves per node), kidney-shaped, and have scalloped edges similar to those of older leaves.
- Plant is distinguished by sprawling growth, kidney-shaped leaves with scalloped edges, attached with long petioles and purplish-blue flowers on short, upright stalks. Leaves also have a mint-like odor when crushed. Roots are shallow, fibrous, and form at the base and at leaf nodes on the stem.
- When growing in partial shade, leaves are usually deep green, but they may be reddish if located in full sun. Veins on leaves radiate outward from a common point like fingers.



13) Heal-all, *Prunella vulgaris* L.,

Life Cycle - perennial

Conditions for seed germination and spread

- Reproduces by seed and by somewhat creeping stems
- Found in open woodland, meadows, pastures, waste areas, roadsides, lawns, and around buildings.
- Able to avoid mowing by growing as a prostrate plant
- Stems root at nearly every node.

Identifying the Seedlings

- Square rough-hairy stems rooted at nodes touching the soil.
- Leaves opposite (2 per node), ovate to elliptic or round, the lower ones usually broader and with longer stalks, green or with a purplish cast; margins smooth or shallowly and irregularly toothed.



14) Creeping Buttercup *Ranunculus repens*

Life Cycle - Perennial

Conditions for seed germination and spread

- spreads by stolons and forms thick carpets on wet, poorly drained soils

Identifying the Seedlings

- a low-growing plant with short swollen stems (somewhat hairy) and creeping stolons that root at the nodes
- Leaves are dark green with light patches and are divided into three toothed leaflets, the central leaflet on a stalk
- Pale patches on the leaves distinguish creeping buttercup from similar looking plants such as hardy geraniums



15) Broadleaf Plantain *Plantago major*

Life Cycle - perennial

Conditions for seed Germination

- spreads rapidly by seed and new shoots arising from the roots.
- does particularly well in compacted or disturbed soils and even soggy sites

Identifying the Seedlings

- Cotyledons (seed leaves) are oblong with a base that abruptly narrows to a winged stalk. The first and next few leaves are football shaped, 7–20 mm in length, with a base that tapers abruptly into a stalk.
- As they develop, leaves become oval, ribbed, short-stemmed, hairless, forming basal rosettes which tend to hug the ground. They grow 5–20 cm long and 4–9 cm broad, with an acute apex and a smooth margin; there are five to nine prominent parallel veins from the base.
- Roots are fibrous and shallow.



16) Canada Goldenrod *Solidago canadensis*

Life Cycle - perennial

Conditions for seed Germination

- reproduce by seeds and short rhizomes (horizontal underground stems) emerging from the base of aerial stems
- does not tolerate frequent disturbances, so it is mainly found growing in untilled fields, ditches and roadsides
- Prefers sun, moist conditions and medium textured soils; not usually establishing well on very wet, very dry or shady sites.

Identifying the Seedlings

- Seed leaves (cotyledons) are small and elliptical. The first leaves produced are basal and hairless or with a few hairs on the edge.
- Young leaves are round, bluish green, pale beneath and feel rough due to hairs on the edge and underneath on the veins. Young leaves are 3-nerved, meaning the midrib and 2 parallel lateral veins are prominent. Young stems are purple-stained.
- Mature leaves are alternate, narrow, lance-shaped, tapered at both ends, hairless on the upper surface, hairy underneath, and sharply toothed on the edge. Lack petioles ie bases attach directly to the stem
- The extensive root system is very deep and fibrous with 5 to 12 cm-long rhizomes (horizontal underground stems) emerging at the base of aerial stems. Rhizomes are often reddish.



17) Curled dock *Rumex crispus*

Life Cycle - perennial

Conditions for seed Germination

- Reproduce primarily by seed in disturbed, unmanaged sites, and disturbed moist places.

Identifying the Seedlings

- New basal rosettes of leaves form in early winter.
- Seedlings vary in color, from entirely green to red tinged in cooler months. The hairless cotyledons are long and narrow with slightly rounded tips. The first few leaves are egg shaped to football shaped with a rounded tip and a tapered base. Leaves are alternate to one attached to petioles along the stem, forming a rosette.
- Stems below the cotyledons may be maroon at the base and young leaves may also have reddish patches
- Mature leaves - lower rosette leaves are lance-shaped, petioled, without hairs, alternately arranged on the stem, dark green with wavy margins. Stem leaves are arranged alternately along the stem, have a membranous sheath that encircles the stem, and become progressively smaller up the stalk. Leaves become more reddish-purple with age.
- Large, fleshy tap-root is yellowish orange in color.



18) Annual sowthistle *Sonchus oleraceus*

Life Cycle - Perennial

Conditions for seed Germination

- Reproduce by seed in disturbed sites

Identifying the Seedlings

- Cotyledons are egg shaped to narrowly football shaped, hairless, short stalked and about 4–8 mm long. The first leaf is egg shaped, sparsely hairy, and the leaf edge is lined with backward pointing teeth. Leaves are alternate to one another along the stem.
- Mature plants are coarse, erect, and can reach to 1.4 m tall. The stem is smooth, thick, hollow between nodes, and secretes a milky sap when cut. The leaves are hairless and appear bluish green. The upper leaves are smaller than the lower leaves which are about 10–20 cm long, with a tapered base, and are deeply lobed.



19) Common groundsel *Senecio vulgaris*

Life Cycle - Winter Annual

Conditions for seed Germination

- Reproduces by seed especially in disturbed places.

Identifying the Seedlings

- Cotyledons are narrowly football shaped to oblong, 3–11 mm long, with a rounded to somewhat pointed tip, a tapered base, and often purplish below.
- The first leaves are egg shaped, have edges with shallow teeth, are alternate to one another along the stem, and are about 8–12 mm long. Third and fourth leaves are more deeply lobed. Young plants remain as rosettes until maturity.
- Mature plants are erect with a single stem or branches from the base. It can grow up to 60 cm tall. Leaves are highly variable: they are deeply lobed with toothed edges and may be hairless or lightly covered with long wavy or cotton-like hairs; upper leaves are smaller than lower leaves and attach directly to the stem while lower leaves have short petioles.



20) Common Horsetail *Equisetum arvense*

Life Cycle - perennial

Conditions for seed Germination

- Tiny spores are dispersed by water. Fragmented rhizomes and tubers may be transported by garden tools or agricultural equipment
- often found on wet, poorly drained soils, but it can grow under a very wide range of conditions

Identifying the Seedlings

- tuber-bearing creeping root system
- no true leaves and two kinds of stems. In early spring, fertile, light-brown, jointed stems topped with rounded, spore-bearing cones appear. These wither when the spores are shed and infertile, green stems with whorls of leaf-like branches, growing to 80 cm, remain until the fall. Extensive, dark, felt-like creeping roots have small tubers.
- Field horsetail has two types of hollow stems which grow from deep, creeping rootstocks. The leafless or fertile stems are light brown in colour, about one foot high with a spore bearing cone up to one and half inches long at the top. These emerge in early spring and die back soon after the spores are shed.
- The plants are maintained by small tubers that store food reserves and an extensive creeping rhizome system that penetrates to great depth in the soil.



Summary

To effectively manage weeds, it's important to **Know our Enemy**. By understanding a specific weed's life cycle, its method of reproduction and its germination preferences, we are better armed in the fight to control its spread.

Weeds are also indicator plants. In some instances they give us insight into what's happening in our garden soil. That 'heads-up' not only helps us deal with the offending weed, but also gives an indication of what soil amendment might be beneficial if we want other plants to thrive in that bed.

It all comes down to knowing our problem weeds a bit better, then making plans to deal with them in a timely way, before they've spread seed or before they've sent their creeping stolons throughout our perennials or turf grass.

This has obvious benefits in terms of a gardener's work load as well as ensuring the vitality of our ornamental plants or crops that are competing for those very precious resources – light, nutrients and moisture.

It truly pays to know your enemy! Happy Weeding,

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References/Resources:

Virginia Tech Weed ID Guide <http://www.ppws.vt.edu/weedindex.htm>

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<http://www.oardc.ohio-state.edu/weedguide/singlerecord.asp?id=960>

USDA

<http://www.plant-materials.nrcs.usda.gov/pubs/mopmcpu6313.pdf>

<http://images.bugwood.org/> BugwoodImages, USDA and University of Georgia's Center for Invasive Species and Ecosystem Health.

<ftp://ftp-fc.sc.egov.usda.gov/GA/PMC/Documents/SeedlingIDSoutheast.pdf> Seedling ID Guide for Native Prairie Plants

BC Government Ministry of Agriculture <http://www.agf.gov.bc.ca/cropprot/weedguid/horsetl.htm>