

Weeds as Indicators of Soil Conditions in Lawns and Landscapes

Norma Samuel and Chris Marble

Introduction

Any plant growing where it is not needed is a “weed,” so any plant species can be considered a weed depending on the situation. Integrated pest management best maintains a weed-free landscape; consistently mowing at the correct height and providing adequate amounts of water and fertilizer, for example, keeps a lawn healthy. For more information on proper turf cultural practices, read [UF/IFAS EDIS publications specifically pertaining to turfgrass](#) and other documents about turfgrass management such as the [Florida Lawn Handbook](#).

Weeds can be excellent indicators: species that may reflect or predict environmental conditions such as moisture levels, pH, soil fertility, light conditions, or compaction of the site. Certain weeds can indicate that an underlying issue is causing stress to turf or in poorly maintained planting beds. No matter what kind of environment you create—by mowing too low/high, leaving the turf too wet/dry, using too much or too little fertilization, etc.—there is a weed species that will thrive in that condition (Siddig, Ellison, Ochs, Villar-Leeman, and Lau 2016). The best way to prevent or reduce weed growth is to maintain a healthy turf and landscape plants.

This publication—intended for pest control professionals, landscape contractors, Master Gardeners, and homeowners—provides examples of weeds commonly found under specific environmental conditions. While weeds can indicate certain environmental conditions, some weed species can thrive in many different environments. For example, spotted spurge (*Euphorbia maculata*) can be indicative of a dry site, but it also grows well and spreads in over-irrigated sites. *E. maculata* and other adaptable weeds are followed by an asterisk in this publication’s

tables. The presence of one or two weed species is not necessarily diagnostic of a specific cultural problem; but heavy infestations or the presence of multiple species that prefer a particular condition could indicate that cultural practices should be altered.

Moisture Levels

Moist/Wet Soils

A healthy lawn should be irrigated at most twice per week. Look for signs of stress before irrigating the lawn: leaf blades folding or turning blue gray or footprints and mowers leaving their tracks on the lawn. Apply ½ to ¾ inch of water at each supplemental irrigation cycle to condition the turfgrass to be drought tolerant as it will develop a deeper root system (Trenholm, Unruh, and Cisar 2017).

Lawns that are over-watered or in an area that remains wet for extended periods of time can become overtaken with problematic weeds which include sedges, doveweed, and dollarweed. One can control weeds in wet areas by hand-pulling them; watering less often or with less water per irrigation event; improving drainage in low lying areas; and/or planting alternatives to turf that will thrive in moist soils. These cultural practices can be used solely or in conjunction with the application(s) of herbicides.

Table 1. Weeds common in moist or wet soils.

Common Name (Scientific Name)	Life Cycle
Spreading dayflower (<i>Commelina diffusa</i>)	Annual or short-lived perennial
Doveweed (<i>Murdannia nudiflora</i> , <i>Aneilema nudiflorum</i>)	Warm-season annual
Green kyllinga (<i>Cyperus brevifolius</i>)	Perennial
Yellow nutsedge (<i>Cyperus esculentus</i>)	Perennial
Globe sedge (<i>Cyperus globulosus</i>)	Perennial
Purple nutsedge (<i>Cyperus rotundus</i>)	Perennial
Annual bluegrass (<i>Poa annua</i>)*	Cool-season annual
Southern fleabane (<i>Erigeron quercifolius</i>)	Annual or short-lived perennial
Common chickweed (<i>Stellaria media</i>)*	Winter annual
Slender/path rush (<i>Juncus tenuis</i>)*	Perennial
Virginia buttonweed (<i>Diodia virginiana</i>)	Perennial
Old World diamond flower (<i>Hedyotis corymbosa</i>)	Warm-season annual
Asiatic pennywort (<i>Centella asiatica</i>)	Perennial
Dollarweed, pennywort (<i>Hydrocotyle</i> spp.)	Perennial
Cluster flower (<i>Flaveria trinervia</i>)	Warm-season annual
Asiatic dayflower (<i>Commelina communis</i>)	Warm-season annual
Nimblewill (<i>Muhlenbergia schreberi</i>)	Perennial
Eclipta (<i>Eclipta prostrata</i>)	Warm-season annual



Figure 1. Dollarweed (*Hydrocotyle* spp.) is a reliable indicator of wet environments.
Credit: Chris Marble, UF/IFAS

Dry Soils

On the opposite end of the spectrum, some weed species can thrive in dry soils and/or under drought-like conditions. In many cases, landscapes receive too much supplemental irrigation, but turf and landscape plants also can become stressed if not watered enough, especially during establishment. In these cases, certain weed species—listed in Table 2—can become more competitive.

Table 2. Weeds Common in Dry Soils

Common Name (Scientific Name)	Life Cycle
Goosegrass (<i>Eleusine indica</i>)*	Warm-season annual
Shiny cudweed (<i>Gnaphalium spicatum</i>)	Cool-season annual or biennial
Spotted spurge (<i>Euphorbia maculata</i>)	Warm-season annual
Black medic (<i>Medicago lupulina</i>)	Cool-season annual
Bitter sneezeweed (<i>Helenium amarum</i>)	Warm-season annual
White clover (<i>Trifolium repens</i>)	Perennial
Plantain (<i>Plantago</i> spp.)	Perennial
Prostrate knotweed (<i>Polygonum aviculare</i>)*	Warm-season annual
Red/sheep sorrel, sourgrass (<i>Rumex acetosella</i>)*	Perennial
Common lespedeza (<i>Lespedeza striata</i>)*	Warm-season Annual
Spanish needle (<i>Bidens alba</i>)	Annual or short-lived perennial
Florida pusley (<i>Richardia scabra</i>)	Warm-season annual

Soil pH

Soil pH is a measure of the acidity or alkalinity of the soil; a pH level of 7 is considered neutral. A pH level below 7 signifies that the soil is more acidic; soils above 7 are considered alkaline. Florida soils can widely vary depending on the area in the state, soil management, and the “parent material” of the turfgrass—i.e., the material that originally formed the soil. The only way to know your soil pH is via testing: sending in soil samples to a laboratory. More information on soil pH and how it can affect landscape plants can be found in the following publication: “[Soil pH and the Home Landscape or Garden](#).” While soil testing is the only reliable way to determine soil pH, some weed species can give clues as to whether a soil is more alkaline or acidic. Weeds common in alkaline and acidic soils are found in Tables 3 and 4.

Table 3. Weeds common in alkaline or high pH soils (>7).

Common Name (Scientific Name)	Life Cycle
Bermuda grass (<i>Cynodon dactylon</i>)	Perennial
Broadleaf plantain (<i>Plantago major</i>)*	Perennial
Clover (<i>Trifolium</i> spp.)*	Perennial
Yellow wood sorrel (<i>Oxalis stricta</i>)	Perennial

Table 4. Weeds common in acidic or low pH soils (<7).

Common Name (Scientific Name)	Life Cycle
Broadleaf plantain (<i>Plantago major</i>)*	Perennial
Red/Sheep sorrel, Sourgrass (<i>Rumex acetosella</i>)*	Perennial
Prostrate knotweed (<i>Polygonum aviculare</i>)*	Warm-season annual
Crabgrass (<i>Digitaria</i> spp.)*	Warm-season annual

Soil Fertility

There are 17 essential elements or nutrients that all plants require for normal growth and appearance. Of these 17 nutrients, the three that most people are familiar with are nitrogen (N), phosphorus (P), and potassium (K) because plants require these three in amounts larger than those of any other element. The best steps to take to determine if there is a soil fertility issue include looking for symptoms of poor fertility (yellowing, stunted growth, etc.) and sending soil or plant tissues to a laboratory for testing, as one would when calculating soil pH. A more in-depth overview of soil fertility can be found in “[General Recommendations for Fertilization of Turfgrasses on Florida Soils](#)” and in other *EDIS* landscape fertilization publications [here](#).

If the lawn or other landscape areas are not fertilized properly, weeds can take over. If too few nutrients are available for the desirable landscape plants (turfgrass or ornamentals), growth and establishment could be reduced which might allow weeds to become more competitive (Blackshaw et al. 2003). In cases when a homeowner does not want to fertilize their future lawn or ornamentals, species should be chosen that can thrive with minimal to no supplemental fertilization. In contrasting cases, when too much fertilization is applied, many weed species utilize that fertilizer more efficiently than the landscape plants, and weed growth and reproduction increases. Too much fertilizer—especially in soluble or quick-release

form—can harm turfgrass and other landscape plants which can allow weeds to be even more competitive.

Most weed species can thrive under high fertility levels, but not all can grow as well under low nutrient conditions. Good examples would be weeds such as clovers, beggarweeds, and creeping indigo, all of which are common in low N soils. A list of weeds that are common in low fertility soils is included in Table 5. While there are several weeds listed below, it should be noted that many weed species can thrive under a wide range of fertility levels.

Table 5. Weeds common in low fertility soils.

Weed Common Name (Scientific Name)	Life Cycle
Crabgrass (<i>Digitaria</i> spp.)*	Warm-season annual
Annual bluegrass (<i>Poa annua</i>)*	Cool-season annual
Prostrate knotweed (<i>Polygonum aviculare</i>)*	Warm-season annual
Clovers (<i>Trifolium</i> spp.)	Annual/perennial
Beggarweeds/ticktrefoil (<i>Desmodium</i> spp.)	Perennial
Sandburs (<i>Cenchrus</i> spp.)	Warm-season annual
Ragweed (<i>Ambrosia artemisiifolia</i>)	Warm-season annual
Lespedeza (<i>Lespedeza</i> spp.)	Warm-season annual
Creeping indigo (<i>Indigofera spicata</i>)	Annual or short-lived perennial



Figure 2. Sandburs (*Cenchrus* spp.) can indicate sandy, low fertility soils.

Credit: Annette Chandler, UF/IFAS



Figure 3. Basketgrass species (*Oplismenus* spp.) are good indicators of shady environments and often thrive under low light levels that can hinder turfgrass growth.
Credit: Annette Chandler, UF/IFAS

Shaded or Low Light Conditions

The amount of sunlight that a plant will need for optimum growth and health varies widely between different species. When there is too much sunlight, plants can become stressed and chlorotic; too little sunlight can cause leggy, spindly growth. Most of Florida's turfgrass species need at least 6 hours of sunlight every day for optimal growth. When there is not enough sunlight, the turf will be stressed and thin, which can increase the competition from weeds. In cases where a plant is not receiving adequate sun, the best option will be to replace the turf or ornamental with a species that is better suited for that condition. More information on turfgrass growth in the shade can be found in ["Growing Turfgrass in the Shade."](#) One may learn to select plant material based on their plant's needs with the [Florida-Friendly Landscaping™ Plant Guide](#).

While turfgrass or landscape plants can suffer if they get too much shade during the day, many weed species can thrive under low light levels. Table 6 lists the common weed species that can be found in shaded or low light areas.

Table 6. Weeds common in shaded or low light conditions.

Common Name (Scientific Name)	Life Cycle
Japanese stiltgrass (<i>Microstegium vimineum</i>)	Warm-season annual
Annual bluegrass (<i>Poa annua</i>)*	Cool-season annual
Common chickweed (<i>Stellaria media</i>)*	Cool-season annual
Ground ivy (<i>Glechoma hederacea</i>)	Perennial
Violets (<i>Viola</i> spp.)	Winter annuals and perennials
Nimblewill (<i>Muhlenbergia schreberi</i>)	Perennial
Basketgrass (<i>Oplismenus</i> spp.)	Annual and perennials

Compacted Soils

Soils can become compacted by heavy foot traffic and machinery or as a result of urban development. In many new Floridian sub-divisions, trucks and machinery that are used to build homes grade and level the soil; this and other forms of soil compaction can negatively affect landscape plants. Multiple weeds, though, can grow and spread just fine in these areas. Weeds included in Table 7 are commonly found in compacted soils. If you suspect your soil is compacted, take the steps in ["Soil Compaction in the Urban Landscape"](#) to diagnose and correct the problem.

Table 7. Weeds common in compacted soils.

Common Name (Scientific Name)	Life Cycle
Goosegrass (<i>Eleusine indica</i>)*	Warm-season annual
Common chickweed (<i>Stellaria media</i>)*	Cool-season annual
Slender/path rush (<i>Juncus tenuis</i>)*	Perennial
Annual bluegrass (<i>Poa annua</i>)*	Cool-season annual
Dandelion (<i>Taraxacum officinale</i>)	Perennial
Spotted spurge (<i>Euphorbia maculata</i>)*	Warm-season annual
Prostrate knotweed (<i>Polygonum aviculare</i>)*	Warm-season annual
Common lespedeza (<i>Lepedeza straita</i>)*	Summer Annual
Wild garlic (<i>Allium vineale</i>)	Cool Season Perennial
Corn speedwell (<i>Veronica arvensis</i>)	Cool-season annual

Saline Soils

Homeowners in Florida can sometimes have salt-affected soils. Natural circumstances, such as the soil being in proximity to the coast, can cause soil to be more saline, as can certain management practices, such as poor fertility management or the use of reclaimed irrigation water. More information is available in “[Maximizing the Benefits of Reclaimed Water for Irrigating the Landscape and Protecting the Environment](#)” and “[Soils and Fertilizers for Master Gardeners: Tackling Soil Salinity Problems in the Home Landscape](#),” Two UF/IFAS EDIS publications. Some weed species that are common in saline soils are included in Table 8.

Table 8. Weeds common in saline soils.

Common Name (Scientific Name)	Life Cycle
Cluster flower (<i>Flaveria trinervia</i>)	Warm-season annual
Purple nutsedge (<i>Cyperus rotundus</i>)	Perennial
Tasselflower (<i>Emilia</i> spp.)	Warm-season annual
Purslane (<i>Portulaca oleracea</i>)	Warm-season annual
Barnyardgrass (<i>Echinochloa crus-galli</i>)	Warm-season annual
Lambsquarters (<i>Chenopodium album</i>)	Cool-season annual
Large crabgrass (<i>Digitaria sanguinalis</i>)	Warm-season annual
Sandbur (<i>Cenchrus</i> spp.)	Warm-season annual
Common ragweed (<i>Ambrosia artemisiifolia</i>)	Warm-season annual

Nematode Infestation

Nematodes are microscopic, unsegmented roundworms. Most nematodes are beneficial to plants and turfgrass, but plant parasitic nematodes are among the most difficult pests to manage in the home landscape. Information on nematode species, testing, and management are provided in EDIS publications [here](#). In cases where nematodes are causing plant damage or resulting in thin or stressed turf, the weed species included in Table 9 may be present. Often serving as hosts of plant-parasitic nematodes, these species may be indicators of nematode populations. The weeds can also tolerate heavy infestations that other ornamental plants or weed species may not be able to (Thomas et al. 2005). The species listed in

Table 9 are not always indicators of nematodes, but if they are prevalent and the problem cannot be attributed to some other cultural or maintenance issue or a biotic problem—such as an insect infestation or the presence of a disease—sampling for nematodes may be warranted.

Table 9. Weeds that can serve as indicators of plant parasitic nematode presence.

Common Name (Scientific Name)	Life Cycle
Prostrate knotweed (<i>Polygonum aviculare</i>)*	Summer Annual
Spurges (<i>Euphorbia</i> spp.)*	Summer Annual
Florida pusley (<i>Richardia scabra</i>)*	Summer Annual



Figure 4. Florida pusley (*Richardia scabra*) can be a possible indicator of nematodes; but nematodes can only be detected using a laboratory assay. Florida pusley and other *Richardia* species may also indicate dry sites and many other site conditions.

Credit: Annette Chandler, UF/IFAS

Summary

Despite the environmental conditions, at least some weed species will be able to grow in one’s landscape. Practicing the Florida-Friendly Landscaping™ Principles can keep weed problems to a minimum. If environmental conditions are suspected or determined to be the cause of the proliferation of a certain weed species, one can help mitigate the spread of certain weed species by improving cultural practices and using herbicides or other non-chemical options.

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¹ This document is ENH1370, one of a series of the UF/IFAS Environmental Horticulture Department. Original publication date May 2023. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.

² Norma R. Samuel, district Extension director, Ph.D., UF/IFAS Central District; S. Chris Marble, associate professor, ornamental & landscape weed management, Department of Environmental Horticulture, UF/IFAS Mid-Florida Research and Education Center; UF/IFAS Extension, Gainesville, FL 32611.

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