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## Using Weeds as Indicators of Turf Management and Environmental Conditions

by Tom Voigt, Extension Turfgrass Specialist  
Dept. of Horticulture, University of Illinois

It is commonly thought that large weed populations are responsible for driving desirable grasses from a turf area. In reality, the presence of weeds, and the lack of turf, is often an indication of the turf's inability to compete and survive in settings where weeds can. Although it is impractical to expect totally weed-free turf, the presence of large numbers of weeds is often an indication of problems in the growing environment or in turfgrass culture. Employing recommended cultural techniques and altering the growing environment can improve turf quality and health and, thus, reduce the need for pesticide applications.

**Reasons for weed invasion** — Large populations of weeds in turf are usually indications of:

- improper turf selection;
- poor culture;
- insect pest or disease invasion;
- excessive traffic; or
- unfavorable growth environment.

Primary to any turf management problem is properly selecting the turf to be used. For the golf course manager, this is generally not a problem area; there is a limited choice of turfgrasses appropriate for use on greens, tees, and fairways. Golf course turf selection is usually dictated by the desired quality, budget, and amount of play, not primarily by a desire to keep weed populations to a minimum.

In any turf setting, following proper turfgrass selection, the second line of defense against weed and pest invasion is the use of correct mowing, irrigating, fertilizing, and cultivating practices. Proper mowing is critical to turfgrass health and appearance. Turfgrasses mowed too short become open, inviting weed invasion. Also, when mowed too short, turfgrass may develop inadequate root systems that allow plants to more readily succumb to insect and disease pests. When allowed to grow too tall, turfgrasses can appear unkempt and coarse-textured. Golf course playability is also altered when turves are allowed to grow tall. Basic mowing recommendations include frequent mowing at the tallest height recommended for the specific turf and use.

Irrigating turfgrasses is also important. Over-watered turf may grow too rapidly, develop shallow root systems, and be prone to invasions of weeds, insects, and diseases. Under-irrigated turf may become open and sparse, develop a poor appearance, and also allow weed invasions. Under most circumstances, when watering, water infrequently and deeply to the depth of the root system. When irrigated lightly and frequently, weed seeds (especially those of annual weeds) can germinate and readily develop into mature weeds because the soil surface is never allowed to dry out.

Fertilizers maintain turfgrass density, vigor, and color. Inadequate nitrogen fertilization leads to open turf that is readily invaded by weeds. Inadequate amounts of other minerals in the soil, especially potassium, phosphorus, iron, and sulfur,

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(Weeds as Indicators cont'd.)

can also reduce turf color, disease resistance, and stress tolerance. Conduct soil tests and supply these elements as recommended by test results. It is important, however, not to supply excessive amounts of phosphorus to established turf. Excessive amounts of phosphorus at the soil surface can encourage development of germinating weed seeds.

Cultivation activities include core aeration, slicing, and vertical mowing. These activities can reduce thatch and prepare turf for overseeding. Core aeration is also useful for reducing soil compaction. Conduct cultivation activities during periods of active growth when turfgrasses are best able to recover from these practices. In areas where annual weeds are a particular problem, conduct cultivation activities during autumn.

Insect pests and disease pests can thin and weaken turves, allowing weed invasion. Control these invaders by using good culture and the appropriate pesticides when necessary.

Excessive traffic physically damages turf and also compacts soil. Thin turf, prone to weed invasion, can result. Perennial ryegrass and tall fescues have the ability to tolerate wear better than most other cool season grasses. Where appropriate,

*Excessive traffic physically damages turf and also compacts soil. Thin turf, prone to weed invasion, can result.*

use these grasses in high traffic areas. In addition, where possible, use lightweight mowing equipment and alter the equipment's path to spread wear evenly over the use area.

Compaction reduces the quantity of large, gas-containing pore spaces in soils. Some weeds (e.g., goosegrass and knotweed) are more tolerant of low soil oxygen conditions than are most turfgrasses. Cultivate these areas so that the turf can better compete with weeds.

Along with compacted soils, other unfavorable growth environments can also create growing conditions to which weeds are more adapted than is turf. Shade that reduces light quantity and quality favors weeds (e.g., creeping charley and common chickweed) rather than turf. Prune or remove trees to allow more light to reach the growing area. This also can increase air movement and decrease disease problems. Excessively wet or dry soils also create environments in which weeds often grow better than does turf. If possible, provide external and internal drainage to move excessive water from the turf root zone. Also, supplemental irrigation can be used in dry periods. In general, try to create growing environments that favor turf and not weeds.

Some weeds are not very specific as to the conditions necessary for invasion. For example, dandelions (*Taraxicum officinale*) and quackgrass (*Elytrigia repens* [*Agropyron repens*]) can occur in a variety of environmental or turf management conditions.

These lists may not prove to be true for every weed situation. For instance, yellow nutsedge, once established, can tolerate dry soils. This weed is, however, more commonly found in moist conditions, especially when first becoming established.

Use this list as a guide when diagnosing turf problems. It, along with knowledge of turf growth requirements, can be of assistance when determining needed changes in growth and management conditions that favor turf health and quality.

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(Weeds as Indicators cont'd.)

**Weeds specific to certain environmental and management conditions** — Often, the presence of specific weeds in turf provides clues to the type(s) of environmental and management problems. By learning about weeds that commonly occur under certain conditions, managers can more easily identify these problems and correct them. The following list:

**Acid Soils**

bentgrasses (*Agrostis palustris*)  
red sorrel (*Rumex acetosella*)

**Compacted Soils**

annual bluegrass (*Poa annua*)  
bermudagrass (*Cynodon dactylon*)  
common chickweed (*Stellaria media*)  
goosegrass (*Elusine indica*)  
knotweed (*Polygonum aviculare*)  
mouse-ear chickweed (*Cerastium vulgatum*)  
prostrate spurge (*Euphorbia supina*)

**Dry Soil**

black medic (*Medicago lupulina*)  
carpetweed (*Mollugo verticillata*)  
red sorrel (*Rumex acetosella*)  
sandbur (*Cenchrus pauciflorus*)

**Dry, Infertile Soils**

yarrow (*Achillea millefolium*)

**High-Fertility Soils**

annual bluegrass (*Poa annua*)  
bentgrasses (*Agrostis palustris*)  
bermudagrass (*Cynodon dactylon*)  
crabgrasses (*Digitaria* spp.)  
mallow (*Malva neglecta*)  
purslane (*Portulaca oleracea*)

**Low-Fertility Soils**

plantains (*Plantago* spp.)  
red sorrel (*Rumex acetosella*)  
smooth brome (*Bromus inermis*)  
timothy (*Phleum pratense*)

**Low Mowing Height**

annual bluegrass (*Poa annua*)  
bentgrasses (*Agrostis* spp.)  
bermudagrass (*Cynodon dactylon*)  
crabgrasses (*Digitaria* spp.)  
white clover (*Trifolium repens*)

**Moist or Poorly Drained Soils**

annual bluegrass (*Poa annua*)  
bentgrasses (*Agrostis* spp.)  
common chickweed (*Stellaria media*)

crabgrasses (*Digitaria* spp.)  
goosegrass (*Elusine indica*)  
ground ivy (*Glechomahederacea*)  
mouse-ear chickweed (*Cerastium vulgatum*)  
speedwells (*Veronica* spp.)  
violets (*Viola* spp.)  
yellow nutsedge (*Cyperus esculentus*)

**Moist, Fertile Soils**

curled dock (*Rumex crispus*)  
henbit (*Lamium amplexicaule*)  
yellow wood sorrel (*Oxalis stricta*)

**Moist, Infertile Soils**

white clover (*Trifolium repens*)

**Moist Shade**

annual bluegrass (*Poa annua*)  
nimblewill (*Muhlenbergia shreberi*)  
rough bluegrass (*Poa trivialis*)  
violets (*Viola* spp.)

**New Seedings**

barnyardgrass (*Echinochloa crusgalli*)  
crabgrasses (*Digitaria* spp.)  
henbit (fall plantings) (*Lamium amplexicaule*)  
purslane (*Portulaca oleracea*)  
yellow foxtail (*Setaria glauca*; also listed as *S. lutescens*)

**Shade**

annual bluegrass (*Poa annua*)  
common chickweed (*Stellaria media*)  
ground ivy (*Glechomahederacea*)  
mouse-ear chickweed (*Cerastium vulgatum*)  
nimblewill (*Muhlenbergia shreberi*)  
violets (*Viola* spp.)

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In Springfield, the Illinois General Assembly voted on and passed Senate Bill 240, amending the Environmental Protection Act. This bill prohibits open burning of landscape waste (leaves) in any county with more than 100,000 inhabitants.

Because of the land use diversity in our state, the bill provides an exemption for agriculture purposes, nurseries, and conservation management purposes. Air quality is to be a top priority as respiratory problems are increasing dramatically.

Most metropolitan counties will be affected. I doubt if golf courses will be considered as agriculture.

by Bruce Williams on Bulletin Board