

AIR & SOIL TEMPERATURES

Cool-season grasses

AIR TEMPERATURE

Heat kill likely	131°
Shoot growth ceases	90°
Optimum temperature for shoot growth*	60-75°
Shoot growth ceases	40°

SOIL TEMPERATURE

90°	Shoot growth ceases
77°	Root growth ceases
70°	Maximum temperature for root growth of any consequence
70°	Time to plant grasses in late summer
60-75°	Optimum temperature for shoot growth
50-65°	Optimum temperature for root growth
40°	Shoot growth ceases
33°	Root growth ceases
20°	Low temperature kill possible if temperature subsequently drops rapidly below 20° F

*Optimum turf performance may not coincide with optimum root and/or shoot performance

Warm-season grasses

AIR TEMPERATURE

Heat kill likely	140°
Shoot growth ceases	120°
Optimum temperature for shoot growth	80-95°
Chilling injury resulting in discoloration is possible	50°
Initiation of dormancy occurs resulting in discoloration	50°

SOIL TEMPERATURE

120°	Shoot growth ceases
110°	root growth ceases
80-95°	Optimum temperature for shoot growth
75-85°	Optimum root growth
74°	Optimum time to overseed bermudagrass with ryegrass in the fall. Time to plant grasses in the spring.
64°	Expected sprin root decline is triggered and roots turn brown and die within 1 or 2 days.
50°	Root growth begins to slow below this temperature.
50°	Chilling injury resulting in discoloration is possible.
50°	Initiation of dormancy occurs resulting in discoloration.
25°	Low temperature kill possible.



Symptoms of soil problems

If your turfgrass behaves in the following ways, it's a sign that there's trouble down below, and time to investigate for compaction or nutrient deficiencies:

- ▶ shallow but extensive root system
- ▶ little or no roots below four inches.
- ▶ little or no top growth
- ▶ off-color, very chlorotic tissue
- ▶ easily wilted
- ▶ low density with weeds
- ▶ poor response to fertilization and soil applied pesticides

- ▶ prolonged wet soil that limits recreational uses
- ▶ water easily runs off the turf surface.

Some sites may have all of the above symptoms, while others may have just a few. Some symptoms may take a long time to show (root growth), while others are quickly visible (top growth).

Many other factors can cause the symptoms described above, making a definitive diagnosis nearly impossible. Thus, soil management is often considered an art more than a science.

TURFGRASS - IDEAL CUT & FREQUENCY

TURFGRASS SPECIES	HEIGHT OF CUT (INCHES)	FREQUENCY OF CUT (DAYS)
Bahiagrass	3-4	10-14
bentgrass greens	<0.25	daily
fairways	0.25-0.75	daily-7
Bermudagrass greens	<0.25	daily
fairways	0.5-1.5	2-3
athletic fields	0.75-1.5	3-7
home lawns	0.75-1.5	3-7
centipedegrass	2-3	10-14
fine fescues	1.5-2.5	7-14
Kentucky bluegrass	1.5-3.0	7-14
perennial ryegrass	1.5-2.5	7-10
St. Augustinegrass	3-4	7-14
tall fescue	2-3	10-14
zoysiagrass	1-2	10-14

RELATIVE HEAT HARDINESS OF 18 TURFGRASSES

HARDINESS RANKING	SPECIES	
Excellent	zoysiagrass Bermudagrass St. Augustinegrass	buffalograss carpetgrass
Good	tall fescue	meadow fescue
Medium	colonial bentgrass creeping bentgrass	Kentucky bluegrass
Fair	Canada bluegrass chewings fescue red fescue	annual bluegrass perennial ryegrass redtop
Poor	Italian ryegrass	rough bluegrass

FLOOD TOLERANCE OF SELECTED TREE SPECIES

Very tolerant/ tolerant	Somewhat tolerant	Intolerant
bald cypress	American elm	bitternut hickory
black willow	American holly	black cherry
boxelder	black gum	blackjack oak
eastern cottonwood	burr oak	black oak
green ash	downey hawthorn	black walnut
hackberry	honeylocust	flowering dogwood
nutall oak	red elm	Kentucky coffeetree
overcup oak	river birch	linden
pin oak	southern red oak	loblolly pine
red maple	swamp white oak	mockernut hickory
shingle oak	water oak	post oak
silver maple	willow oak	redbud
sugarberry	winged elm	red mulberry
sweetgum		red oak
sycamore		sassafras
water tupelo		shellbark hickory
		shagbark hickory
		shortleaf pine
		shumard oak
		white oak

PRIMARY SOURCE: WHITLOW, T., H. AND R.W. HARRIS, FLOOD TOLERANCE IN PLANTS: A STATE-OF-THE-ART REVIEW; NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPT. OF COMMERCE, AUGUST 1979: 1-161.

MADE FOR THE SHADE

Trees

Scientific name	Zones	Common name
<i>Acer circinatum</i>	1-6	vine maple
<i>Acer palmatum</i>	5-8	Japanese maple
<i>Acer pennsylvanicum</i>	3-8	striped maple
<i>Alnus sp.</i>	2-7	alders
<i>Cercis canadensis</i>	4-9	eastern redbud
<i>Cornus sp.</i>	1-9	dogwoods
<i>Corylus sp.</i>	4-9	hazels
<i>Illex sp.</i>	3-8	hollies
<i>Podocarpus macrophylla</i>	4-9	yew pine
<i>Thuja occidentalis</i>	5-9	arborvitae
<i>Tsuga sp.</i>	3-8	hemlocks

Check with local nurseries or extension service for new, popular cultivars.

Shrubs

Scientific name	Zones	Common name
<i>Berberis sp.</i>	5-8	barberry
<i>Euonymus japonicus</i>	7-9	evergreen euonymous
<i>Fatsia japonica</i>	8-10	fatsia
<i>Illex sp.</i>	3-8	hollies
<i>Ligustrum sp.</i>	3-7	privets
<i>Lonicera sp.</i>	5-7	honeysuckles
<i>Nandina domestica</i>	6-9	heavenly bamboo

Check with local nurseries or extension service for new, popular cultivars.

SOURCE: "TURFGRASS SCIENCE AND CULTURE," PRENTICE-HALL, INC. BY JAMES B. BEARD