

CMG GardenNotes #571

## Lawn Care

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### Soil Compaction

Soil compaction is the most common problem in lawn quality. With reduced soil oxygen levels, rooting systems will be more shallow. With compaction, the grass roots have reduced access to water and nutrients. Irrigation and fertilization will need to be light and more frequent.

Aerating (removing plugs) once or twice a year will help reduce soil compaction in an established lawn area if enough passes are made to yield plugholes at 2-inch intervals. The best time of year to aerate (power-rake, over-seed or plant) a lawn is late August to late September, as fewer weed seeds germinate this time of year. Aerating the lawn area around a tree is also the best method to promote tree vigor. [Figure 1]

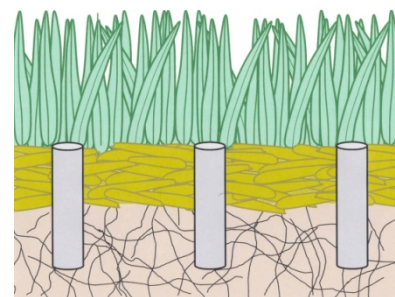


Figure 1. Core aeration helps reduce soil compaction when enough passes are made over the lawn to yield plugholes at 2-inch intervals.

### Fertilization

#### When to Fertilize

The natural grass growth cycle influences proper fertilization time for lawns. The graph on the right illustrates typical root and shoot growth patterns of cool-season turfgrass species. [Figure 2]

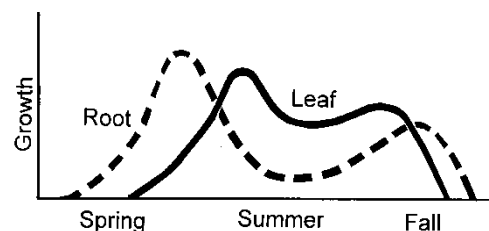


Figure 2. Growth cycle of roots and shoots for cool-season turf.

The graph on the right illustrates the influence on shoot growth when nitrogen fertilizer is applied. Heavy spring fertilization promotes shoot growth, reducing carbohydrate energy reserves and stress tolerance. [Figure 3]

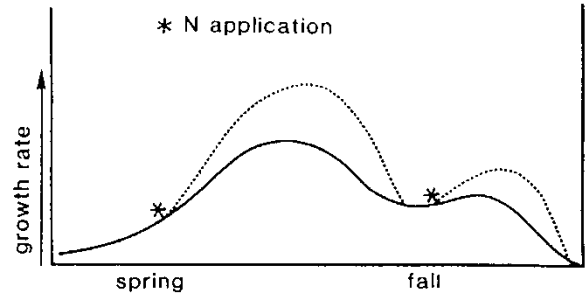


Figure 3. Influence on shoot growth for nitrogen fertilization.

### Benefits of fall fertilization on cool season home lawns

- Enhances storage of carbohydrate energy reserves
- Strengthens root system
- Increases shoot density
- Increases stress tolerance
- Better fall & winter color
- Earlier green-up in spring

### Application Rates

<b>Table 1. Fertilizing Cool Season Turf</b> Pounds Nitrogen per 1000 square feet <sup>1</sup>			
<b>Maintenance level</b>	<b>Low</b>	<b>Moderate</b>	<b>High</b>
<b>Mid-March to April<sup>2</sup></b>			½ - 1
<b>May to early-June</b> (before summer heat)		½ - 1	½ - 1
<b>July to early August</b> (during summer heat)	0	0	0
<b>Mid-August to mid-September</b> (after summer heat)	½ - 1	½ - 1	½ - 1
<b>Early October to early November</b> (while lawn is green and at least 2-3 weeks before the ground freezes)		½ - 1	1-2
<b>Year total</b>	½ - 1	1½ - 3	2½ - 4

1. Use lower rate where clippings are left on the lawn recycling nutrients back to the soil. Use higher rate where clippings are removed.
2. March-April application may not be necessary when fertilizer late fall.

## Selecting a Lawn Fertilizer

Most lawn fertilizers include a quick release form of nitrogen for quick green-up. Better lawn fertilizers also contain slow-release forms of nitrogen for sustained greening. Examples are listed in Table 2.

**Table 2. Example of Quick and Slow Release Fertilizers**

<u>Quick-Release Nitrogen</u> for fast green-up	<u>Slow-Release Nitrogen</u> for sustained green
Ammonium sulfate	Resin-coated urea
Ammonium nitrate	Sulfur-coated urea
Potassium nitrate	Isobutylidene diurea (IBDU)
Urea	Methylene urea
	Urea formaldehyde
	Manure
	Poultry waste

## Fertilizers and Water Pollution

Home lawn management techniques play a significant role in protecting or polluting surface water. Popular press has incorrectly labeled lawns as a major contributor to water pollution. It is not the lawn, but rather the management style of the gardener that become the problem.

Fertilizers and pesticides (herbicides, insecticides, and fungicides) spread onto hard surfaces (driveways, sidewalks, streets and compacted soils) will move with surface water into neighboring lakes, streams and ponds. (Surface water running down the street gutter is not treated before release into local lakes, streams, and ponds.)

However, phosphate fertilizer applied to a lawn or garden soil is bound to the soil and does NOT leach into ground water. The phosphate could move into surface water with soil erosion.

Organic fertilizers are not necessarily safer for the environment. The pollution potential is based on where the fertilizer is applied and application rates. Any fertilizer becomes a potential pollution problem when over-spread into hard surfaces. Over application of both manufacture and organic fertilizers have been linked to ground water contamination.

Potential pollution problems arise from the careless application rather than the type of fertilizer applied. In most Colorado soils, lawns do not need phosphate fertilizers.

## **Mowing**

For Colorado cool season turf types, mow home lawns at 2 ½ to 3 ½ inch height. The taller mowing height promotes deeper rooting. Mowing a lawn too short lowers plant vigor and competitive ability due to reduced photosynthesis.

Mow often enough that only 1/3 of the grass height is removed.

**Don't bag it** – Leaving the clippings on the lawn will:

- Reduce mowing time by 1/4 to 1/2
- Recycle nutrients (equivalent to 1 to 1½ fertilizations)

Lawn clippings and leaves mowed, swept, or blown onto the street are the major source of phosphorus pollution in urban lakes and streams. With side discharge lawnmowers, mow in a direction to prevent clippings from being blown onto the street, driveway and other hard surfaces. Do not sweep or blow lawn clippings into the cutter and street. [Figure 4]

Figure 4. Grass clippings and leaves mowed, blown, or swept onto the street are the major source of phosphorus pollution in urban lakes and ponds. Mow in a direction to prevent clippings from being blown into the street.



Also, leave an un-mowed grass buffer strip edging any lakes, streams, ponds and wetlands.

In a natural setting, rain and snowmelt absorbs mostly into the soil. Air borne pollutants and pollen washed out of the air are broken down by soil microorganism activity. The nitrogen and phosphorus released from the decay of grass, leaves, and other organic matter recycle back into the soil.

However, in the landscape setting, the water cycle is greatly changed by large areas covered by hard surfaces (streets, driveways, walks, parking lots, compacted soils, and buildings). In a typical landscape setting 55% of a rainfall moves as surface runoff, compared to only 10% in a naturalized setting. Nutrients from grass and leaves (along with fertilizers, pesticides and other water-soluble pollutants) readily wash off the hard surfaces into the storm sewer system. Here the pollutants end up in local streams, ponds, and lakes.

## Thatch

Thatch is the brown, spongy organic layer of both living and dead grass roots and stem located between the green blades and the soil surface. One-half inch or less of thatch may be acceptable as it may cushion and insulate the soil. However, when thatch become greater than one-half inch deep, it restricts air and water movement into the soil and can harbor insects and diseases.

Factors that lead to thatch problems include the following:

- **Sod over compacted soil** – When sod is laid over compacted soils, a thatch problem will develop in a couple of years.
- **Soil compaction** is a common contributor to thatch build-up as it slows the activity of soil microorganisms.
- **Over fertilization** is a common contributor to thatch build-up as the lawn may be growing faster than the microorganism can break it down.
- **Grass species** – Kentucky bluegrass and fine fescue are prone to thatch problems. Tall fescue and buffalograss are not thatch formers.

- **Frequent heavy irrigation** may contribute to thatch as lower soil oxygen levels slow the activity of soil microorganisms.
- **Pesticides** – Excessive use of some pesticides may also slow soil organism activity.

Light power raking of a moist matted turf may help reduce thatch problems. Deep power raking may actually damage the turf. The materials removed in power raking should be composted before use as a surface mulch or soil amendment.

Core aeration is a better method of reducing thatch. Enough passes must be made over the area to make plug holes at two-inch centers.

## Weed Management

Lawn weed killers provide only temporary control if management factors that favor weeds are not addressed. In a thin turf with heavy traffic, weed problems may intensify following the use of weed killers. When the weeds (which help absorb the wear and tear of foot traffic) are removed with weed killers, the lawn may thin. The thin lawn opens the soil to increased weed problems.

Soil compaction is the primary cause of weed problems. Weed management factors include the following.

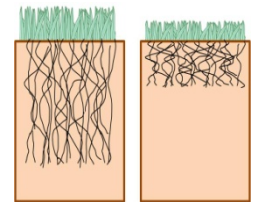
**Core aeration** – Soil compaction favors weeds and discourages lawn growth.

**Common lawn weeds including annual bluegrass, black medic, chickweed, clover, crabgrass, knotweed, prostrate spurge, and plantain thrive in compacted soils.** Clover may be a good companion crop for lawns in compacted soils, filling in between the thin grass.

**Mowing** – High mowing height (shading) and frequent cutting discourages weeds.

**Watering** – Deep, infrequent watering will drought out many common shallow rooted lawn weeds. [Figure 5]

Figure 5. Deep infrequent watering will drought out many common shallow root lawn weeds.



**Limited fertilizer** – A thick, actively growing turf chokes out most weeds. However, fertilizer will not thicken up a turf when soil compaction is the growth-limiting factor.

For additional information on turf weed management, refer to these CSU Extension Fact Sheets:

- ***Annual Grassy Weed Control in Lawns*, #3.101**
- ***Broadleaf Weed Control in Lawns*, #3.100**

## Insect and Disease Management

In Colorado and other semi-arid climates, turf insect and disease problems are minimal, compared to other areas of the nation.

Frequent use of lawn insecticides may increase the occurrence of lawn insect problems. Some garden insecticides have a potential to kill birds feeding in the treated areas (refer to the insecticide label). Thus, avoid unwarranted treatments of lawn areas.

When controlling soil insects, the insecticide must be watered into the root zone to be effective. Some insecticides get held-up in the thatch and do not water in effectively.

Under Colorado conditions, lawn diseases are minimal, compared to other areas of the nation. With Colorado's dry climate, fungicides do little to nothing for home lawn disease management. Cultural practices (fertilizer, watering, and soil compaction) are the keys to disease management. See specific fact sheets for additional details. [Table 3]

**Table 3. Influence of Cultural Practices on Kentucky Bluegrass Diseases**

	<u>Soil Compaction</u>	<u>High N</u>	<u>Low N</u>	<u>Thatch</u>	<u>Irrigation</u>	<u>Mowing</u>
Asochyta Leaf Blight	yes	yes		yes	timing	yes
Necrotic Ring Spot	yes	yes		yes	drought with heat	yes
Leafspot and Melting Out	yes	yes	yes	yes	timing (wet/dry cycle)	yes
Gray Snow Mold	yes	yes				
Dollarspot	yes		yes	yes	drought	low
Stripped Smut			yes	yes		
Fairy Ring	yes		yes	yes		

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