Rockbridge Extension Master Gardeners

Navigation Bar

Lawns

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This module was developed by Phyllis Turner, PhD, Bedford Extension Master Gardener

Welcome to ‘Lawns’

In this module you will learn how to establish, renovate and maintain a lawn. You will learn the most common weeds in lawns and their recommended management.

- Read Chapter 11, in your Master Gardener Handbook before viewing these slides
- Browse the Suggested Readings at the end of these slides. They contain online sources that will be helpful for your learning
- The Test Your Knowledge section is for fun and review

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What Will I Learn in This Module (Objectives)

- Description of common varieties of cool and warm grasses for the area
- Factors to remember in purchasing quality seed and sod
- Maintaining a lawn
- How to calculate the percent Nitrogen that is WIN in a bag of fertilizer
- Recommended grass varieties for the area

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Lawns

Establishing & Maintaining a Lawn
Lawn Maintenance
Grasses and Grass-Like Weeds
Turf Diseases

Renovating an Old Lawn
Periodic Maintenance
Weed Management
Turf Insects

.Photo credit: B. Kovach, Rockbridge MG

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Establishing a Lawn

STEP #1:

- SOIL TEST
- Determines nutrients available in the soil
- Allows recommendations for liming and fertilizer

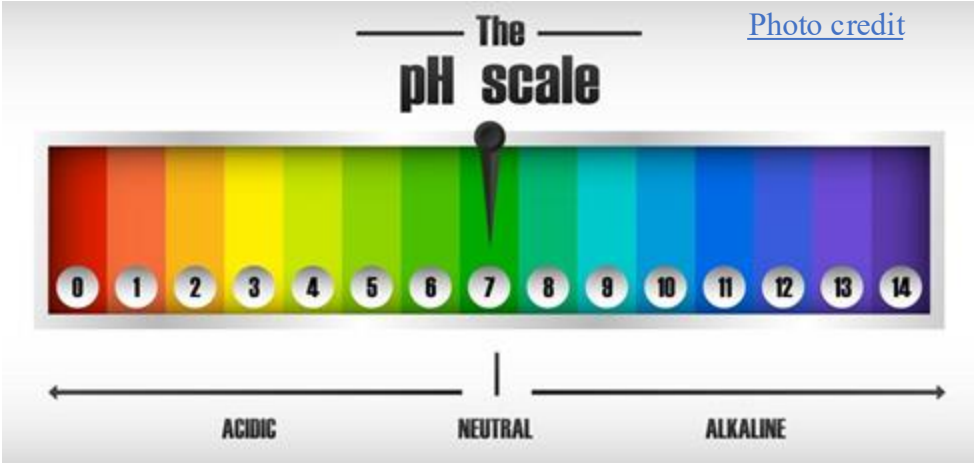

Photo credit

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Establishing a Lawn

- Seed
- Sprigs
- Plugs
- Sod
- Depends on:
  - The grass desired
  - Environmental conditions
  - Time constraints
  - Financial considerations

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Establishing a Lawn

- Pre-plant Weed Control
- Grassy weeds require control with non-selective herbicides
- Controlling perennial broadleaf weeds before establishment is beneficial

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Establishing a Lawn

Photo credit

Irrigation and/or Drainage

- Should be installed prior to topsoil application

Soil Preparation

- Remove debris
- Remove rotting wood (may cause fairy rings)
- Allow new soil to settle 2 to 3 weeks before seeding or sodding
- Wetting & drying cycles will aid in settlement
- Settlement should yield no less than a 6 to 8-inch depth

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Establishing a Lawn: Lime

- Most soils in Virginia are acidic
- Ideal pH is for grass is 6.2
- Clay soils require a little more lime
- For low available magnesium use dolomitic limestone
- Ground agricultural limestone is recommended

Establishing a Lawn

- Seed will germinate ONLY under proper conditions
- Fall seedings are preferred for cool-season grasses (September 15 to October 15)
- Early spring seedings **may** bring good results if moisture is adequate (February 15 to March 30); although preferred time is fall
- Sod can be planted throughout the year except in mid-winter when the ground is frozen
- Sodding should be delayed during extreme heat and/or drought
- If done under drought conditions, it must be kept moist & cool

Establishing a Lawn

Warm-season grasses are normally sprigged, plugged, or sodded

- Should be established during May after the soil has warmed
- May and June plantings will have the best chance of surviving the first winter
- Late plantings are not recommended – not sufficient time for proper root and rhizome establishment before winter

Seeding versus Sod

Photo credit

- Soil preparation for both methods DO NOT differ
- Seed is less expensive (initially)
- Overall expense less with sod
- Weed-free, establishment less likely with seed
- Excessive potential of erosion with seed due to requirement for seed to germinate and become well-rooted
- Sodding eliminates such problems, especially on hills or banks

Photo credit

Seeding versus Sod

- Sodding provides immediate turf, is quickly functional, and provides competition with viable weed seed already in the soil

- Seeding is only recommended in the early fall or early spring, whereas sod may be established in nearly any season – except the middle of winter – with the proper moisture

Seeding and Mulching

- Well-prepared seedbed is essential for the establishment of turf grasses
- Seedbed should be tilled to a depth of 6”
- Lime and fertilizer should be worked in at this time
- Seedbed should be smoothed and made firm
- Divide seed and sow in two directions – perpendicular
- Cover seed by raking lightly or rolling

Seeding and Mulching

- Avoid a smooth surface
- Should have shallow, uniform depressions or rows about ½” deep and 1-2” apart
- Mulch the area with either straw or other suitable material so that 50% - 70% is covered
- 1-2 bales per 1000 ft²
- Light mulch does not need to be removed
- Heavy mulches should be removed when seedlings are 2” tall – avoid damaging seedlings

Seeding

- Begin normal mowing practices when the turf grass seedlings reach a height one-third higher than the normal mowing height
- A light application of nitrogen fertilizer made when the seedlings are between 1½ and 2 inches tall will enhance the establishment rate substantially
- Apply about one-half pound of actual nitrogen per 1,000 square feet watered into the soil

Seeding

- Water often enough to keep the seedbed moist but not saturated
- The quantity of water applied will be small and should be maintained for at least three weeks following planting
- As the turf grass matures, reduce irrigation to a maintenance level to promote a deep root system

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Seeding

- Most herbicides are somewhat toxic to newly germinated turf grass plants
- Delay post-emergence applications of a herbicide for weed control as long as possible after seeding
- Follow recommendations found on pesticide labels closely as far as timing of application and planting

Sprigging

- Sprigging is the planting of stolons or rhizomes in furrows or small holes
- A sprig is an individual stem or piece of stem of grass without any adhering soil
- A suitable sprig should have two to four nodes from which roots can develop
- It is extremely important to maintain a moist surface during the initial establishment from sprigs
- If practical, top-dress newly planted sprigs at regular intervals

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Photo credit

Plugging

- The planting of 2 to 4-inch diameter square, circular or block-shaped pieces of sod at regular intervals is called plugging
- Three to 10 times as much planting material is necessary for plugging as sprigging
- Plugs are planted into prepared soil on 6 to 12-inch centers
- The closer the plugs are planted together, the faster the sod will cover
- The closer the plugs are planted together, the more sod it will take to provide plugs to cover the lawn area

Care after Plugging

- Post-plugging care involves mowing at the height and frequency required for that particular turf grass
- A fertilizer application made three to four weeks after plugging enhances the establishment rate
- Proper irrigation procedures will also enhance establishment of a lawn through plugging

Renovating an Old Lawn

- Determine cause of poor quality
- SOIL TEST
- Control weeds and undesirable grasses
- Dethatch
- Aerate
- Apply lime & fertilizer
- Sow the seed
- Apply crabgrass control
- Water frequently

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Recommended Turf grass for Virginia

Cool Season; long growing season; green winter color

- Kentucky Bluegrass
- Tall Fescue
- Creeping Red, Hard & Chewing Fescue
- Perennial Ryegrass

Warm season; go dormant after first frost for entire winter

- Zoysiagrass
- Bermudagrass

Virginia Turfgrass Variety Recommendations

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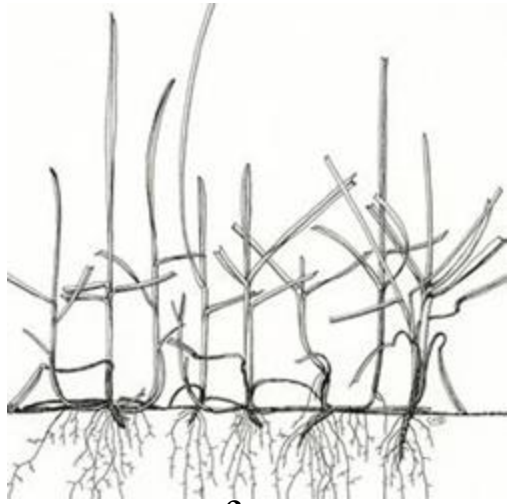
Kentucky Bluegrass

- Best suited for areas in and west of the Blue Ridge Mountains and north of Richmond
- Provides lush, blue-green, fine-bladed lawns
- Does not perform well in heavy shade or poor soil
- Is known for its hardiness
- Prefers full sun; A few cultivars have tolerance to light shade
- Has a good recovery ability; once water is again available, it can initiate new growth from the crown of each plant
- Spreads by rhizomes
- Slow to establish by seed

Kentucky Bluegrass. Photo creditucanr.edu



Overall plant structure of Kentucky bluegrass

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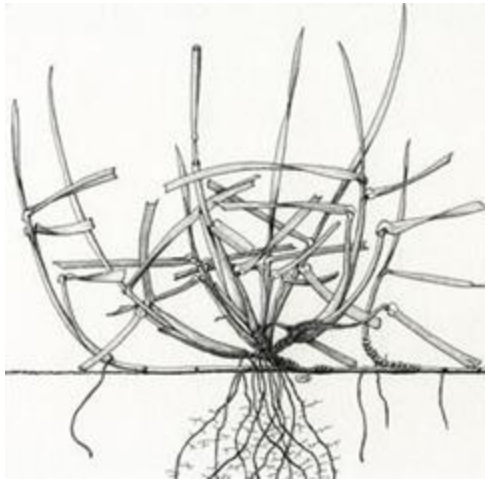
Tall Fescue

- Moderately coarse-textured turf grass
- Good heat & wear tolerance
- Can be very drought tolerant
- Prefers full sun; tolerates shade
- Has a bunch-type growth habit
- Does not recover well after being damaged
- Develops a deep root system; this advantage is lost when grown on shallow or extremely compacted soils
- May require periodic overseeding to maintain a stand quality
- Winter hardiness is a concern
- Its coarse texture and aggressive growth habit make it objectionable in many situations because it does not mix well with other turfs

Tall Fescue.
Photo credit: ucanr.edu



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Creeping Red, Hard, & Chewing Fescues

- Tolerate shade, drought, low-nitrogen, & acid soils
- Perform best in shady lawns; Most are bunch-type grasses
- Not particularly heat-tolerant; May decline in full sun when mowed frequently; Many adapt to shade
- Maintenance levels are generally low; especially fertilizer needs
- Tolerate dry periods quite well due to low water requirements

Understanding Those Fescues. Photo credit: Missouri.edu

Fine fescues like creeping red fescues do spread by short rhizomes, while others like chewing, hard, and sheep fescues are bunch-type.

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Perennial Ryegrass

- Medium-textured
- Quick to germinate and establish
- Good traffic bearing characteristics
- Early spring green-up; Provide quick erosion control
- Tend to be susceptible to disease in hot weather
- Poor heat tolerance; Little tolerance to dry conditions
- Do not persist well in non-irrigated areas
- Bunch-type grass
- Quality very similar to Kentucky bluegrass
- Maintenance needs are moderate to high
- Not suggested to be used alone as a lawn grass

Perennial Ryegrass.
Photo credit: ucanr.edu

Overall plant structure of perennial ryegrass

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Zoysia grass

- Warm-season
- Fine to medium-textures
- Turns brown with first hard frost in the fall
- Greens up in mid-May
- Does well in full sun
- Not suitable for shady lawns

Zoysiagrass. Photo credit: Clemson.edu

Bermudagrass

- Warm-season; spreads aggressively by strong wiry stolons
- Fine-bladed; grows up to 2 ft. tall
- Goes dormant in winter and turns brown
- Not recommended for lawns in the northern Piedmont or in & west of the Blue Ridge Mountains

Bermudagrass

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Annual Lawn Maintenance

- Frequent mowing is an important part of turf maintenance
- It is best to remove no more than one third of the vegetation at one mowing
- If mowed too closely, root growth is slowed
- This reduces the lawn's tolerance to heat and drought
- Weeds are more likely to invade closely cut lawns
- Will reduce stress levels of the turf
- Will increase the likelihood of the grass surviving drought
- Lower mowing heights in fall will aid leaf collection

Annual Lawn Maintenance

Recommended mowing heights for turf grasses

- Kentucky bluegrass 1 ½ ″ to 2 ½ ″
- Tall fescue 2″ to 3″
- Creeping red fescue 2″ to 3″
- Perennial ryegrass 1 ½ ″ to 2 ½ ″
- Bermudagrass ½″ to 1″
- Zoysiagrass ¾″ to 1″

Mow Like a Pro

Photo credit: vt.edu

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Fertilization

- Fall fertilization enhances the quality of cool-season grasses in Virginia
- Better density and root growth
- Less spring mowing
- Better fall-to-spring color
- Less weed problems
- Better drought tolerance
- Less summer disease activity

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[Lawn Fertilization in Virginia]

WIN versus WSN

WIN is water insoluble nitrogen, which is slowly released for use by the turf over a long period of time (several weeks, months); less likely to cause foliar burn

WSN is water soluble nitrogen which is quickly available

Both WIN and WSN are desirable for lawn maintenance

Calculating how much fertilizer to apply to your lawn

Must know: square footage of turf to be treated, recommended application rate and the analysis of the fertilizer

Example:
Green-Way fertilizer (18-6-12) has been chosen to provide 1 lb. of total N per 1000 sq. ft. of area. The turf area is 7,000 sq. ft. How much Green-Way fertilizer is needed to fertilize the area?

- (Area to be fertilized) x (recommended rate of N) = Total lbs. of N needed
- (7,000 sq. ft.) x (1 lb. N per 1000 sq ft) = 7 lbs. N needed for the job (lbs. nutrient needed) / (percent nutrient in analysis)= lbs. of actual fertilizer needed
- (7 lbs. N needed)/(.18N/lb. of fertilizer) = 38.9 lbs. of fertilizer needed for the job
- Therefore, about 39 lbs. of 18-6-12 are needed to supply 1 lb. of N per 1000 sq. ft. to a 7000 sq. ft. lawn

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Calculating lime needs of your lawn

Most fertilizers tend to cause an acidic reaction in the soil; The $CaCO_3$ equivalent is a measure of the acidifying potential of a fertilizer.

It expresses how much $CaCO_3$ (calcium carbonate; limestone) would have to be applied to the turf area to counteract the acidifying effects after one ton (2000 lbs.) of the fertilizer had been applied to the area.

Calculating Lime Needs

- Example: Green-Way fertilizer is applied at a rate of 5 lbs./1000 sq. ft. to a lawn. How much CaCO3 (limestone) would have to be applied to counteract the effect of 5 lbs. fertilizer /1,000 sq. ft. applied to a 40,000 sq. ft. area?
- (5 Lbs. of fertilizer) / (1000 sq. ft) x (40,000 sq.ft.) = 200 lbs of fertilizer applied

➢Fertilizer label says 2000 lbs. fertilizer needs 250 lbs. CaCO3 to neutralize it

- (200 lbs. of fertilizer applied) x (250 lbs CaCO3) / (2000 lbs. fertilizer indicated on label) = 2.5 lbs. CaCO3
- Thus, 2.5 lbs. of limestone would be needed per 40,000 sq. ft. to neutralize the acidifying nature of 200 lbs. of applied fertilizer.

The acidfying nature of a fertilizer is rarely of critical concern, but in the absence of a soil test, it is a way of partially estimating lime requirements over a long period of time.

Adapted from the University of Massachusetts Cooperative Extension, 2001

Irrigation

- Water composes 75-85% of the weight of a healthy grass
- Essential for: germination, tissue formation, plant cooling, food manufacturing, nutrient absorption & transportation
- Deep, infrequent irrigation will encourage deep root growth, efficient water use, and turf grass quality so water penetrates 6 to 8 inches deep
- The best time to water a lawn is early morning when evaporation is minimized
- Early evening or night watering leaves the lawn wet at night, which increases the potential for disease

Irrigation

- A light sprinkling of the surface encourages root development near the surface and increases weed seed germination
- The resulting, limited root system will require frequent watering and constant surface moisture
- Lawns can use an inch or more of water per week in hot, dry weather

Periodic Maintenance

Dethatching

Aeration

Weed Control

Disease Control

Insect Control

Dethatching

Photo credit

- Tightly interwoven layer of living and dead stems, leaves, and roots between the green grass and the soil surface
- A layer of thatch less than a half inch in thickness can be beneficial to the grass; similar to mulch and provides many of the same benefits
- Too much thatch provides a habitat for insects and disease and makes the grass less tolerant of heat and drought

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Dethatching

- Dethatching should be done during low- stress periods
- Cool-season grass lawns should be dethatched in early fall or early spring
- Warm-season grass lawns should be dethatched June through July

Aeration

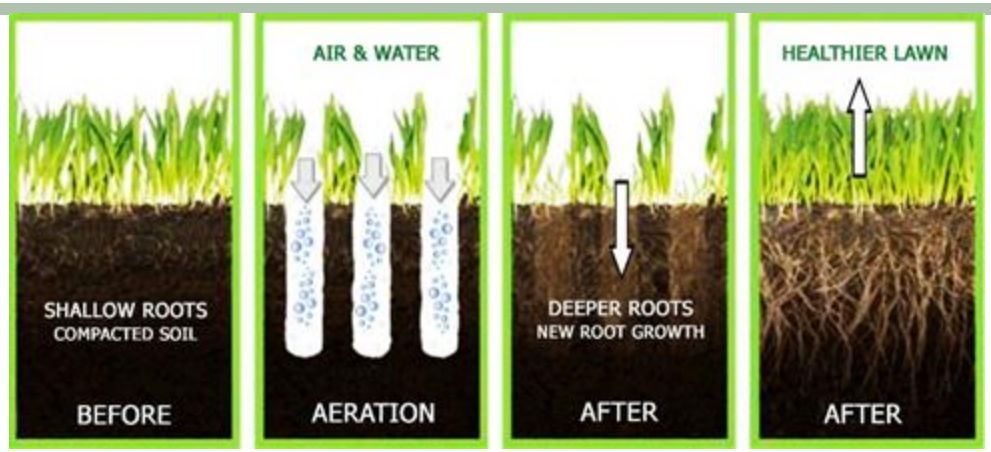

Photo credit

- If soil is heavy or compacted, or thatch is a problem, aeration may be necessary
- Compacted soil prevents the flow of oxygen from the atmosphere to the roots
- Roots need oxygen as well as water and nutrients
- Best done by a machine which forces hollow metal tubes into the ground and brings up small cores of soil
- The soil should be moist , neither too wet nor too dry
- Soils are aerated during the same seasons as dethatching

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Grasses and Grass-like Weeds

- Crabgrass
- Goosegrass
- Foxtail
- Orchardgrass
- Nimbleweed

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Grassy weeds
Lawn Weed Identification

Smooth Crabgrass

A Summer annual, dies after first frost

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Smooth Crabgrass.
Photo credit: ncsu.edu

Large Crabgrass

A Summer annual, dies after first frost. Prostrate, spreading, branched, and rooting at the nodes.

Photo Credit:

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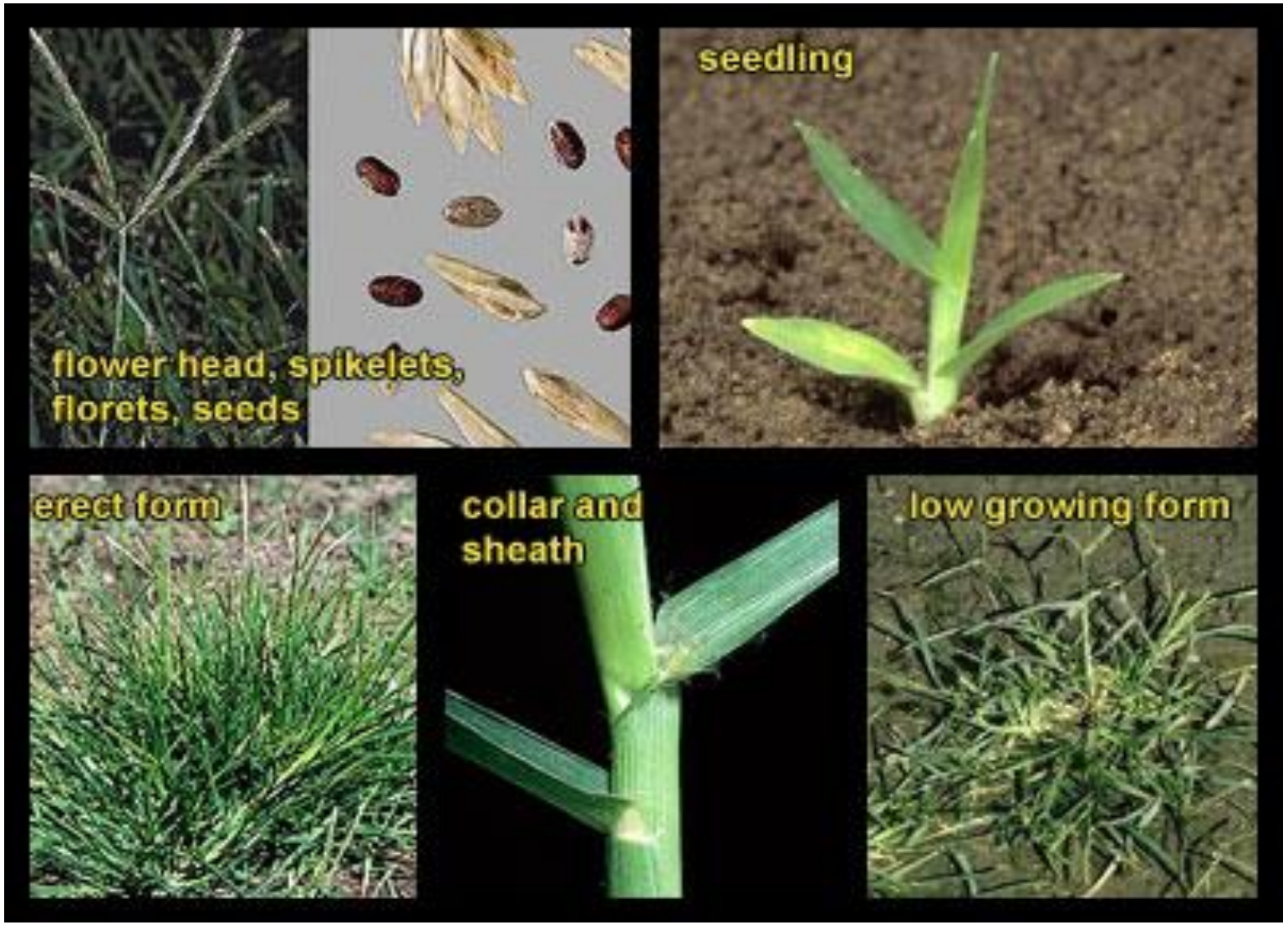
Goosegrass (Silvergrass)

Germinates later than crabgrass & continues through summer



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Goosegrass. Photo credit: ucanr.edu

Foxtail

Summer annual; often confused with crabgrass

"Foxtail", any of the weedy grasses in the genera *Alopecurus* and *Setaria* of the family Poacea. Foxtails are so named for their spikelet clusters of bristled seeds, which are dispersed as a unit and somewhat resemble the bushy tail of a fox. In some species, these units have a pointed tip and retrose (backward pointing) barbs and can become lodged in the ears and nostrils of dogs and other animals." https://www.britannica.com/plant/foxtail

Foxtails. Photo credit: ucanr.edu

Foxtail Control. Photo credit: oregonstate.edu

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Orchardgrass

Bunch type cool season perennial; tall growing; tolerates shade & drought; excellent for animal pasture and wildlife
Produces an extensive fibrous root system.
Pollen is an important contributor to early season hay fever

Orchardgrass.

Nimblewill (*Muhlenbergia schreberi*)

Perennial; spreads by stolons; grows rapidly; turns brown in winter (Sometimes referred to as Nimbleweed)
A native warm season perennial grass, confused with creeping bentgrass or bermudagrass

Nimblewill.
Photo credit: umd.edu

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Broadleaf Weeds

Common Chickweed

Broadleaf Plantain

Dandelion

Ground Ivy

Henbit

Purple Deadnettle

White Clover

Yellow Woodsorrel (Oxalis)

Common Chickweed (*Stellaria media*)

- Winter annual forms dense mat smothering other plants; prefer moist shaded areas;
- Seed can remain dormant many years;
- Height 3-6” in sun, taller in shade;
- Seed can remain viable up to 10 years.

Common Chickweed.
Photo credit: umd.edu

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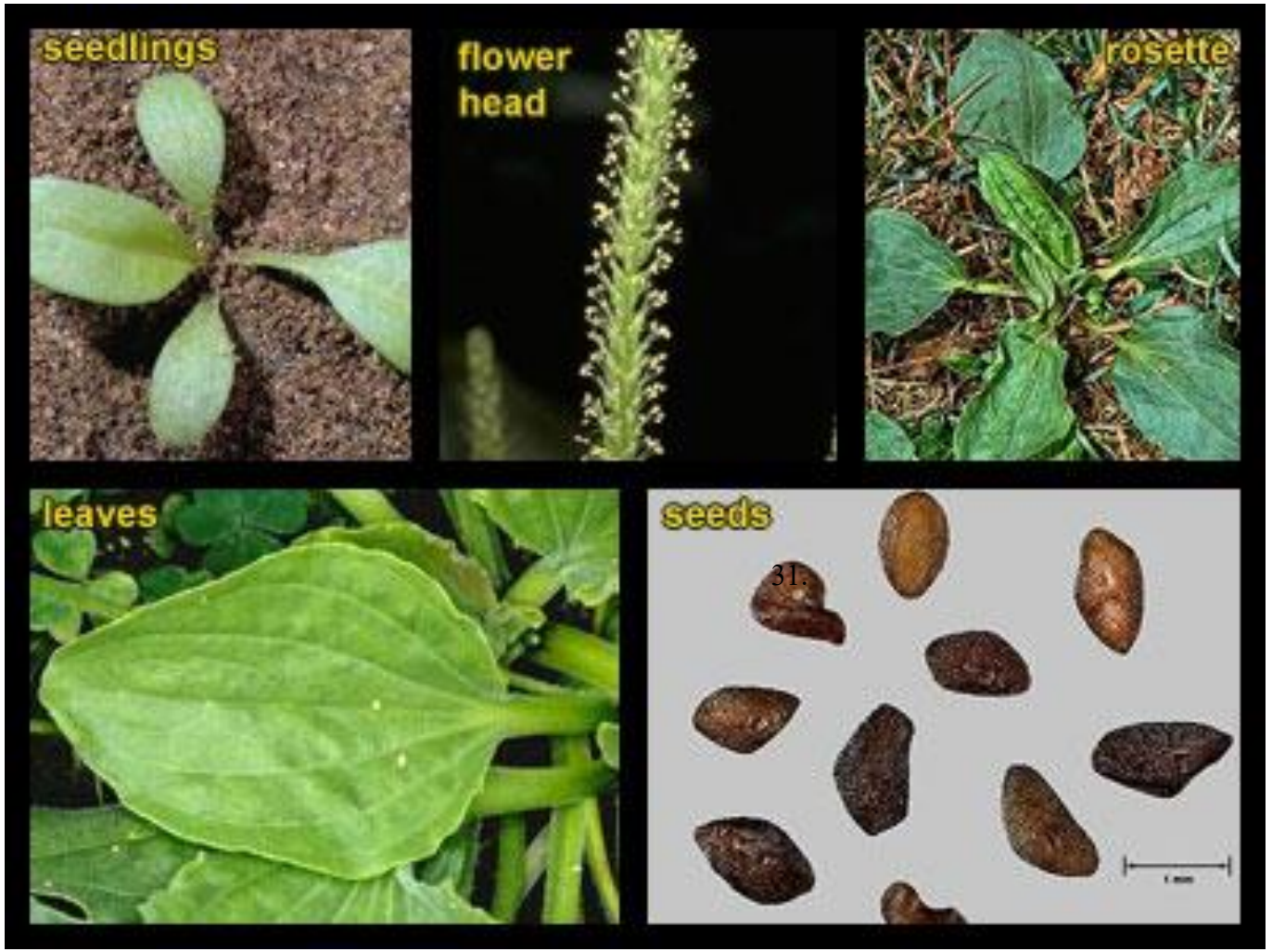
Broadleaf Plantain

Perennial; leaves grow in rosette; thick taproots

- A perennial broadleaf plant.
- Grows where many other plants won't survive.
- Reproduces by seed.



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[Broadleaf Plantain.](#)

[Photo credit: ucanr.edu](#)

Dandelion (*Taraxacum officinale*)

- Also known as lion's tooth, puffball, blowball and monk's head
- Most common; forms a rosette; thick taproot; Has been used as an herb and medicinal plant; A perennial; Buds grow from the uppermost area of the root, so it can regenerate a new plant even when the plant is cut off at the soil surface
- Can crowd out desirable species

Photo credit: B. Kovach EMG, Rockbridge Co

Dandelions

Ground Ivy (*Glechoma hederacea*)

Creeping perennial; shaded areas; mint like odor

- Also known as creeping Charlie; gill-over-the-ground, haymaids
- Creeping perennial flowers from March through June
- A member of the mint family characterized by its square stems
- Reproduces by creeping stems that root at a node
- Prefers damp shady areas but can tolerate full sun
- Maintaining a healthy turf can deter it

Ground Ivy.

Photo credit: umd.edu

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Henbit (*Lamium amplexicaule*)

- Winter annual; square stems; pink purple flowers
- In the mint family, stems are square; plants produce a mint like smell
- Can be highly competitive in newly seeded areas
- Is an overwintering host for soybean cyst nematode and an alternative host for corn earworm

Henbit. Photo credit: Clemson.edu

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Purple Deadnettle (*Lamium purpureum*)

- Winter annual with square stems.
- The petioled leaves, triangular and sometimes purplish-red upper leaves help to distinguish this weed from Henbit (*Lamium amplexicaule*), which has upper leaves that do not occur on petioles (sessile)
- A member of the mint family, has square stems, a mint smell

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[Purple Deadnettle.](#) Photo credit: vt.edu

White Clover (*Trifolium repens* L.)

- Creeping; short lived perennial; Also known as Dutch clover
- Seeds grow in seedpods with extremely hard seed coats
- Grows rapidly and spreads via stolons
- Clover fixes nitrogen
- Shorter than most other clovers

White Clover

Photo credit: B. Kovach, EMG Rockbridge Co

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Yellow Woodsorrel (Oxalis)

- Perennial; heart shaped leaves
- Flowers May through September
- Stems are green to purple with alternate leaves with long petioles
- Trifoliate leaf arrangement
- Often mistaken for white clover
- Seeds are ejected explosively as far away as 12 feet
- Root system is shallow and fibrous

There is also a creeping woodsorrel that is more prostrate, that roots at nodes and has leaves that are often a purple tint

Oxalis (Yellow Woodsorrel).

Japanese StiltGrass

- Also known as bamboograss, flexible seagrass, Mary's grass, Microstegium, Vietnamese grass
- Summer annual commonly found in shady moist areas; spreading rapidly in woodlands throughout the southeastern U.S.; most common in woodlands of the Piedmont and mountains of the southeast
- Germinates in early; spring, flowers from mid-September through October
- Is prostrate to erect, sprawling, freely branched; roots at nodes; Has broader shorter leaves than most other annual grasses
- Some of the florets will produce seed before flowers have opened
- Populations rapidly decline when control measures prevent seed production ; Mulches are ineffective; Close mowing reduces seed production, mowing in late summer reduces seed production
- Few herbicides are labeled for Japanese stiltgrass, and few herbicides are labeled for use in wet woodlands
- Pre-emergence and post-emergence herbicides used for crabgrass control are effective on stiltgrass

Rounded first leaves

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Japanese Stiltgrass. Photo credit: ncsu.edu

Weed Management with Herbicides

Annual Weed Management

- Pre-emergence; Apply in early spring/late summer before weed seeds germinate

Crabgrass Control

- Pre-emergence treatment preferred; Post-emergence control also works

Perennial Weeds

- Best option is generally the use of systemic post-emergence herbicides

Perennial Grasses

- Physical removal or nonselective systemic post-emergence herbicides

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[Fall Lawn Weed Control Strategies]

Weed Management

Herbicide Management:

- Protect Desirable Plants
- Treat when non-target plants are absent or not growing actively
- Use directed or shielded spray
- Use with wick applicator
- Avoid leaching, drift
- Do not use volatile herbicides in hot weather

Common Turf grass Diseases

Brown Patch

Pythium Blight

Red Thread

Rust

Rhizoctonia Blight (Brown Patch)

Appears in brown, tan or yellow patches ranging from 6 inches to several feet in diameter; caused by the fungus *Rhizoctonia solani*. Lesions are evident on the leaves which are tan in color and irregular in shape with a dark brown border. June, July, and August tend to be the peak periods. Warm nights & long periods of leaf wetness are ideal conditions for disease development. Select resistant varieties; mow at proper height; do not water in evening; low N fertilizer spring or summer.

Photo credit: ncsu.edu

These and more pictures can be found at NC State Extension website For chemical treatment, see the Pest Management Guide, at PMG

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Pythium Blight

- First appears as small sunken circular patches up to 1 foot in diameter during hot humid weather; often mistaken for leaf spot
- Leaves covered with cobweb-like white mycelium in early morning, are matted, orange or dark gray in color and greasy in appearance
- Spreads rapidly along drainage patterns; affected spots up to 10 feet in diameter, may appear as elongated streaks
- Spread by equipment, shoes; favored by hot weather, high humidity; long periods of leaf wetness. Treat with fungicides.
- Perennial ryegrass and annual bluegrass are most prone
- Control measures: Water in early morning to prevent fungus; avoid excessive nitrogen; relieve compaction

These and more pictures can be found at NC State Extension website

For chemical treatment, see the Pest Management Guide at PMG

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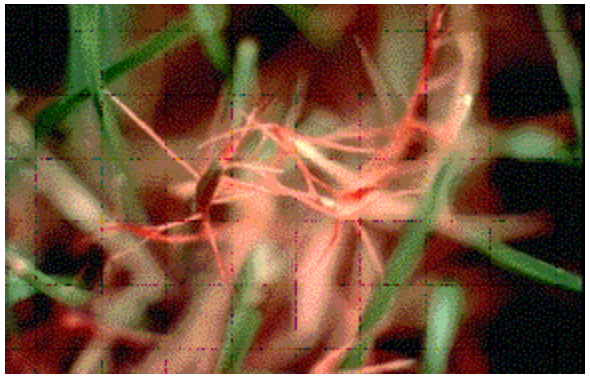
Pythium Blight. Photo credit: ncsu.edu

Red Thread

- A foliar disease of cool season turfgrasses
- Leaves have pink to red, spiderweb-like gelatinous fungal strands; affected spots to 3 feet in diameter
- Leaves die, starting at the tip
- favored by cool temperatures and long periods of leaf wetness; spring & fall; especially severe on slow growing nitrogen deficient turf
- May be confused with pink patch, another turf disease



ncsu.edu. Red Thread.

Photo credit: ncsu.edu

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Rust

- Yellow orange powder (spores) appear in late summer early fall.
- Warm, cloudy, humid weather followed by hot, sunny weather favors rust development.
- Spreads via air, water, shoes, equipment, and vegetative turf material (sod).
- Control through cultural practices: sound watering, mowing & fertilizing; manage thatch.

Rust. Photo credit: umd.edu

Turf grass Insects

White Grubs

Chinch Bug

Sod Webworm

Billbug/Weevil

White grub

- Larvae of several species of beetles
- Feed on roots causing brown areas in lawn
- There are several biological control agents (nematodes, bacteria, fungi) that provide excellent grub control (milky spore is only active on Japanese beetle grubs)
- Natural enemies of grubs include parasitic wasps and flies
- The common life cycle of the more destructive and abundant of these beetles extends over three years – so the most serious damage occurs every three years

Typical white grub

Adult beetles of white grub: June, Japanese, Ground. Photo credit ufl.edu

White Grubs in Home Lawns

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Chinch Bug

- Suck sap from grass producing yellow then brown patches
- St. Augustine grass is primary host
- Management: Provide adequate water
- Treat: dilute liquid dishwashing soap solution (1 oz. per gallon of water to 2 square feet of sod) is irritating to chinch bugs.

Chinch bug nymphal instars and adult

Chinch bug damage

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[Chinch Bugs in Turf.]

Photo credit: ncsu.edu

Sod Webworm

- Larvae or caterpillar stage of several species of Lepidoptera.
- Caterpillars do the damage feeding on grass blades at night leaving small brown areas.
- Prefer well-managed lawns.
- Damage can often be outgrown if water is continually available. Bacillus thuringiensis, or BT is registered for sod webworm management, but it is only effective against the very young larvae.

Mature larvae

Damage from webworm

Adult sod webworm moth

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Sod Webworm. Photo credit: unl

Billbug and Weevil larvae

- Type of weevil or snout beetle. Look like white grubs except smaller & no legs.
- Weevils feed on roots, adults feed on grass blades and stems. Damage is similar to white grubs. Injury appears as wilting and occasional death of grass, often in small scattered patches.
- Biological control = birds, wasps, nematodes; spray insecticides in spring to kill adults.

Billbugs. Photo credit: Illiois.edu

Bluegrass billbug (Sphenophorus parvulus) adult and larva. Photo by David Shetlar, The Ohio State University, Bugwood.org.

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Cultural Control for Lawn Pests and Diseases

- Mowing; Aerating
- Liming; Watering
- Fertilization; Thatch Management
- Species Selection; Variety Selection
- Establishment Practices
- Sanitation
  - Control foot traffic
  - Dispose of diseased clippings
  - Pest-free seed, sprigs, sod
  - Clean, disinfect tools, equipment

[Cultural practices to Reduce Lawn Disease]

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Mechanical / Physical Control of Lawn Pests

Traps and Attractants (e.g. sticky paper)

Water pressure sprays

Insect vacuums

Diatomaceous earth (finely ground skeletons of fossil diatoms; scratch surface of insects, causing dehydration)

Insecticidal Soaps

Barriers Exclusion devices; row covers, nets, paper collars

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[Mechanical Pest Controls]

Chemical Control for Lawn pests

Fungicides

Herbicides

- Nonselective – kills most plants
- Selective – kills some but not others
- Contact – kills only the part sprayed
- Systemic – moves throughout the plant
- Post-emergence – kills existing weed plants
- Pre-emergence – kills germinating weed seeds

Insecticides

- Nonselective – kills most
- Selective – kills some kinds
- Contact – must touch insect
- Stomach Poison – effective when eaten
- Systemic – may be applied to soil

Chemical Control: PMG

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Disease Management

- Disease-resistant turf varieties
- Good cultural practices
- Biological control agents
- Pesticides (Fungicides)

The Perfect Lawn?

A perfectly green, weed-free lawn is a recent invention that may have negative impact on our environment.

The Perfect Lawn?

- Most grasses weren't meant to stay green all season long
- Instead, some grasses naturally go dormant, especially in hot, dry summers
- In dormancy, the top of the grass is sacrificed, but the roots remain healthy underground
- To get grass to stay green all summer requires lots of water
- And, depending on how and when you apply it, as much as 50 percent of this water evaporates before it reaches your grass

The Perfect Lawn?

Some of the fertilizer you put on your lawn will leach through the soil or run off the surface of the soil and get into our lakes and streams.

An Acceptable Lawn

It is possible to have a decent looking lawn that has less of an impact on the environment. Here's how:

- **Choose the right seed**

  Most lawns in our area are planted with Tall fescue, Kentucky bluegrass and perennial ryegrass, which require a lot of nitrogen and water to look good

- **Water the right way**

  Daily watering wastes water and doesn't benefit the grass; water deep once or twice a week during the growing season; water early in the day

- **Feed sparingly**
  - **Fertilize once a year**
  - **Grow more clover**

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End of Slide Set

You can continue to next slide: ‘Suggested Readings’ OR

Click on the box below to return to the Navigation Page

Suggested Reading

Note: While there are many websites outside of our Virginia Cooperative Extension resources that have good information, that information may not be applicable for your geographic area. This is especially true regarding the life cycle and treatment times for insects.

- Chapter 11 MG Handbook
- https://www.dcr.virginia.gov/soil-and-water/document/yardcare.pdf

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Calendar of Lawn Care

Following is a calendar of lawn care developed by Scott Baker, Extension Agent, for the Bedford area. This is several slides of information.

ENVIRONMENTAL LAWN CARE CALENDAR

(cool-season species: fescue, bluegrass, ryegrass)

January – February

Sharpen Your Lawnmower's Blade – a clean cut promotes grass health.

March

- Apply Lime if Needed.
- Start Mowing – don't cut below 2.5 inches.
- Sow Grass Seed. (Late August – early October is a better time)
- Aerify, Overseed if needed.
- Consider Using Pre-emergence Herbicide for Crabgrass and/or Post-emergence Broadleaf Herbicide for Chickweed, Dandelion, etc. Crabgrass begins to germinate when forsythia and dogwoods bloom. Annual pesticide applications should not be needed! A thick, vigorous lawn is your best pest control. **Note: Check product label for planting restrictions before using a herbicide.**
- Fertilizer: Established Lawns Do Not Benefit From Nitrogen Applications in the Month of March.

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ENVIRONMENTAL LAWN CARE CALENDAR

(cool-season species: fescue, bluegrass, ryegrass)

April

Finish Seeding, Aerification by April 15.

- Consider the Need for Pre and Post-emergence Herbicides (crabgrass begins to germinate when forsythia and dogwoods bloom). Annual pesticide applications should not be needed! A thick, vigorous lawn is your best pest control. **Note: Check product label for planting restrictions before using a herbicide.**
- Fertilizer: Established Lawns Do Not Benefit From Nitrogen Applications in the Month of April.
- Grub Control Possible: July is More Effective Timing.

May

- Crabgrass is Germinating. Pre-emergence Herbicides are Still Effective, Particularly on Goosegrass. If Lepedeza or Other Summer Annuals Are Present, Consider Post-emergence Herbicides. Annual pesticide applications should not be needed! A thick, vigorous lawn is your best pest control. **Note: Check product label for planting restrictions before using a herbicide.**
- Fertilizer: Apply ½ of a Pound of Actual Nitrogen per 1,000 sq. ft. Slow Release Nitrogen is Preferred. Apply After May 15.
- Sharpen Your Lawnmower's Blade. A Clean Cut Promotes Grass Health.

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ENVIRONMENTAL LAWN CARE CALENDAR

(cool-season species: fescue, bluegrass, ryegrass)

June

- For Lespedeza and Other Summer Broadleaf Weeds, Consider Using Post-Emergence Herbicides. Annual pesticide applications should not be needed! A thick, vigorous lawn is your best pest control.
- Raise Your Lawnmower's Blade. Cut No Shorter Than 2.5 inches.
- If Wiregrass is a Problem, Now is the Time to Prepare For Control. Stop Mowing the Lawn and Let it Grow for One Month Before Treatment.

July

- Lawns Fertilized in March and April May Now Show Brown Patch Disease.
- Control Wiregrass with a 2% Glyphosate spray (note: lawn will require replanting).
- Mow as Needed.
- White Grubs are Hatching From Eggs Laid by Japanese Beetles. Control Them Now if There are More the 6-10 Grubs per Square Foot of Lawn.

Continued…..

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ENVIRONMENTAL LAWN CARE CALENDAR

(cool-season species: fescue, bluegrass, ryegrass)

August

- To Prepare for Planting, Have Soil Tested.
- Contact Extension Office for New List of Recommended Seeds.
- Sow Grass Seed after August 15.
- Aerify, Overseed After August 15.
- Finish Grub Treatments.
- Mow as Needed.
- Consider Pre-emergence Herbicide for Winter Annual Broadleaf Weeds. Annual pesticide applications should not be needed! A thick, vigorous lawn is your best pest control. **Note: Check product label for planting restrictions before using a herbicide.**

September

- Sow Grass Seed. Aerify, Overseed.
- Water Lawns if Seed was Planted.
- Fertilizer: Established Lawns Will Benefit From One Pound of Actual Nitrogen Per 1,000 Sq. Ft. Slow Release Nitrogen Preferred.
- Mow as Needed.

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ENVIRONMENTAL LAWN CARE CALENDAR

(cool-season species: fescue, bluegrass, ryegrass)

October

- Finish sowing Grass Seed by October 15. Aerify, Overseed by October 15.
- Water Lawns if Seed was Planted. Fertilizer: Same as September.
- Mow as Needed.
- Consider Post-emergence Herbicide for Dandelion, Henbit and Other Broadleafs. Annual pesticide applications should not be needed! A thick, vigorous lawn is your best pest control. **Note: Check product label for planting restrictions before using a herbicide.**

November

- Too Late to Sow Grass Seed, Under Normal Weather Conditions. Fertilizer: Same as September if desired.
- Mow as Needed.
- Remove Leaves Dropped on Lawns. Use the Leaves as Mulch or Compost.

December

- Too Late to Fertilize. No Need to Mow, Under Normal Weather Conditions.
- Continue Leaf Removal. Avoid Traffic on Frozen Lawns.

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Table 1. The amounts of various types of fertilizers required to apply certain rates of nitrogen per 1,000 sq. ft.

Fertilizer Analysis	lbs. of nitrogen desired per 1,000 sq. ft.	
	½	1
6-2-0	8.3	16.6
10-10-10	5.0	10.0
12-4-8	4.1	8.3
16-4-8	3.1	6.2
20-0-16	2.5	5.0
23-3-7	2.1	4.3
31-0-0	1.6	3.2
33.5-0-0	1.5	3.0
38-0-0	1.3	2.6
46-0-0	1.1	2.2

Turfgrass Management Practices to Minimize Pollution of Water Resources

- Use slow-release nitrogen when possible.
- Apply water-soluble nitrogen in split application at reduced rates.
- Never apply more than 1 pound of soluble nitrogen per 1,000 sq. ft.
- Apply fertilizers as indicated by soil test.
- Do not spread fertilizer in a manner such that it falls on impervious surfaces.
- Maintain a buffer between fertilized areas and water features.
- Use conservative irrigation practices – Water to only slightly below the rooting depth.
- Apply nutrients at time of year best suited to turfgrass need.
- Return clippings when mowing and mow with the proper frequency.
- Increase mowing heights to allow better root growth.
- Properly identify pests and select pesticides with minimal non-target toxicity and mobility.
- Annual pesticide applications should not be needed! A thick, vigorous lawn is your best pest control.
- Calibrate equipment frequently and apply pesticides safely.
- Practice Integrated Pest Management (IPM) by spot treating, using curative programs and establishing damage thresholds.

COMMENTS

- A high nitrogen fertilizer may be used if soil test phosphorus and potassium levels are Medium or Higher. Apply at the rate of 1lb. of nitrogen per 1000 sq. ft.
- Lime is periodically required for good turf growth. Apply only if soil test indicates it is needed. A typical application will last from 4 to 7 years.
- Avoid springtime fertilizer application! Fertilization at this time will excessively stimulate leaf growth, depleting food reserves in the roots. When warm weather hits, grasses depend on these reserves. If not there, stunting and die out may occur.
- This plan is for cool-season species such as bluegrass, ryegrass and fescue only. Do not follow this plan for bermuda grass or zoysia grass lawns!
- Seeding rates are as follows – KY Bluegrass, 2-3 LB per 1000 square feet; Tall Fescue, 4-6 LB per 1000 square feet; fine leaf fescue, 3-5 LB per 1000 square feet.
- Mowing height is important to maintain a dense sod. From spring through the hot summer months, a higher 2 ½" cutting height is desired since it will put turf under much less stress. In fall (September) a cutting height of 2" is desirable to increase the amount of light reaching the base of the plant, which stimulates new tiller development.

COMMENTS CONTINUED

- Overseeding, if necessary, should be done in August-September. To be successful, seeds must come in contact with soil. This can best be done by first aerifying the lawn with a corer-type aerifier, and then broadcasting seed at the recommended rate. Fertilizer should not be applied from two weeks prior to seeding and for 4 weeks after seeding. This may cause omission of one of the three fertilizer application times but will help insure a successful stand.
- Watering will help maintain a viable lawn. During dry periods, application of 1" of water per week will assist turf growth. If overseeding, watering is essential. If seed germinates and is then allowed to dry out, the viable living plant will desiccate (die).
- Spot treatment of weeds in the spring and summer, as they occur, may be done using a hand-held broadleaf weed sprayer complete with herbicide, which is available at most lawn and garden centers or department stores.
- Insect control may be needed if grubs are a problem. Use a recommended insecticide being careful to follow the directions on the label.

Help Desk Quiz

What Do You Know?

What Do You Know? Part 2

What Do You Know? Part 3

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What do you know about turfs and lawns?

True or False Answers on next slide

1. Warm season grasses are normally sprigged, plugged or sodded.
2. The ideal time to plant cool-season grasses is in June.
3. Weed free establishment is less likely with sod?
4. Most soils in Virginia are acidic.
5. Herbicides are somewhat toxic to newly germinated turfgrass plants and application for weed control should be delayed for as long as possible after seeding.
6. Creeping Red fescue performs best in full sun.

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What do you know about turfs and lawns?

True or False

1. Warm season grasses are normally sprigged, plugged or sodded.
   True
2. The ideal time to plant cool-season grasses is in June.
   False – Ideal time to plant is Sept 15-October 15 to allow for root establishment.
3. Weed free establishment is less likely with sod?
   False – less likely with seeding
4. Most soils in Virginia are acidic.
   True
5. Herbicides are somewhat toxic to newly germinated turfgrass plants and application for weed control should be delayed for as long as possible after seeding.
   True
6. Creeping Red fescue performs best in full sun.
   False – it performs best in shady areas.

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Click to return to 'Test Your Knowledge'

What do you know about turfs and lawns?

True or False Answers on next slide

7. Annual Ryegrass is good to use in an area for a quick erosion control.
8. Zoysiagrass is suitable for shady areas.
9. Frequent mowing is important for proper lawn maintenance.
10. 2/3 of leaf blade should be removed when mowing the lawn.
11. Closely cut lawns reduce lawn's heat tolerance and promote weed invasion.
12. Three inches is the ideal mowing height for fescue turfgrasses.
13. Cool-season grasses are best to fertilize in the fall.

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What do you know about turfs and lawns?

True or False

7. Annual Ryegrass is good to use in an area for a quick erosion control.
   True
8. Zoysiagrass is suitable for shady areas.
   False – it is a warm season grass and likes full sun.
9. Frequent mowing is important for proper lawn maintenance.
   True
10. 2/3 of leaf blade should be removed when mowing the lawn.
    False – Only 1/3 of the blade should be mowed at any mowing.
11. Closely cut lawns reduce lawn's heat tolerance and promote weed invasion.
    True
12. Three inches is the ideal mowing height for fescue turfgrasses.
    True
13. Cool-season grasses are best to fertilize in the fall.
    True

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What do you know about turfs and lawns?

True or False Answers on next slide

14. The best time to water the lawn is in the early evening or at night.
15. Light sprinkling of the lawn surface encourages root development near the surface.
16. A layer of thatch more than 1 inch in thickness can be beneficial to the lawn.
17. Orchardgrass is a good use in livestock pastures.
18. Chickweed seed can remain dormant for many years.
19. The best option for perennial weed management is the use of preemergence herbicides.
20. Red Thread can be especially severe on nitrogen deficient turf.

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What do you know about turfs and lawns?

True or False

14. The best time to water the lawn is in the early evening or at night.
    False – watering at night, potential for disease; early morning is best time to water.
15. Light sprinkling of the lawn surface encourages root development near the surface. True
16. A layer of thatch more than 1 inch in thickness can be beneficial to the lawn.
    False – Less than ½" is ideal; too thick provides habitat for insects and decreases heat/drought tolerance.
17. Orchardgrass is a good use in livestock pastures. True
18. Chickweed seed can remain dormant for many years. True
19. The best option for perennial weed management is the use of preemergence herbicides. False - Systemic postemergence herbicides are best.
20. Red Thread can be especially severe on nitrogen deficient turf.
    True

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Help Desk Quiz Answers on next slide

1. What kind of grass should I plant in my yard in our area?
2. What type of grass seed should I plant in a shady area of my lawn?
3. When is the best time to fertilize my lawn?
4. Are there ways to control weeds in my lawn without using herbicides?
5. When is the best time to kill broadleaf weeds in my lawn?
6. How do I get rid of Johnson grass in my lawn?

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Help Desk Quiz

1. What kind of grass should I plant in my yard in our area?
   Answer: Refer to Virginia Turfgrass Variety Recommendations.
2. What type of grass seed should I plant in a shady area of my lawn?
   Answer: creeping red, hard and chewing fescues (fine fescues) are tolerant of shade, drought, low-nitrogen, and acid soil.
3. When is the best time to fertilize my lawn?
   Answer: Fall for cool season grasses (fine fescues)
4. Are there ways to control weeds in my lawn without using herbicides?
   Answer: To an extent, yes. Weed control can be minimized by good mowing and fertilization management since this makes grass more capable of competing with weeds. Keep turf healthy and provide adequate moisture
5. When is the best time to kill broadleaf weeds in my lawn?
   Answer: when they are most actively growing and/or in the seedling stage.. Usually late spring or early fall
6. How do I get rid of Johnson grass in my lawn?
   Answer: The only thing to eradicate it is an herbicide (e.g. Roundup). Some things to help keep it from spreading include: mowing short; make sure the pH is correct; fertilize grass; or try a post emergence herbicide

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