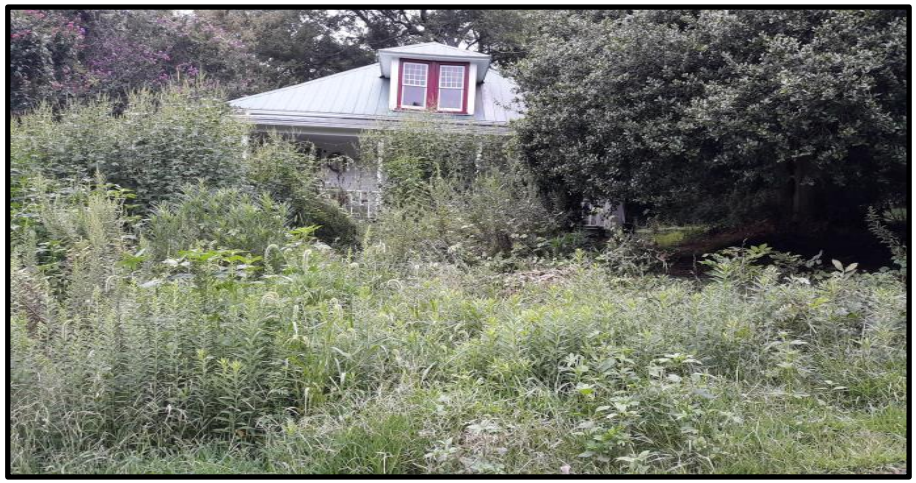
“Love the Lawn”

Orange County
Extension Master Gardener Volunteers

Agenda

- Turf Considerations
- Keys to a Healthy Lawn
- Integrated Pest Management
- Weed Management
- Resources

Your Idea of a Lawn?



Turf Considerations

- Piedmont Climate
- Intended and/or Desired Use
- Site Considerations
- Maintenance?
- When can you accept “brown” grass?

When can you accept “brown” grass?

	Winter	Summer
Cool-season grasses		
Warm-season grasses		

Turf Alternatives

- Reduce irrigation and mowing
- Mulch
- Natural areas
- Tree and shrub beds
- Groundcovers

Keys to a Healthy Lawn

- Soil Test
- Correct Grass
- Plant Properly
- Fertilize Properly
- Mow Properly
- Water properly

Keys to a Healthy Lawn

Soil Test

- Test your soil at least every 2–3 years
- Pick up soil boxes and forms at the Extension Office in Hillsborough or at our information tables at local farmers markets
- Testing is free from April–November
- Adjust pH and fertilize more accurately

Soil Test Results

NCDA&CS Agronomic Division **Phone: (919) 733-2655** **Website: www.ncagr.gov/agronomi/** **Report No. FY19-SL005393**

Bill Harris

Sample ID: RL1

Kear lawn

Lime History:

Bill Harris

Lime Recommendations

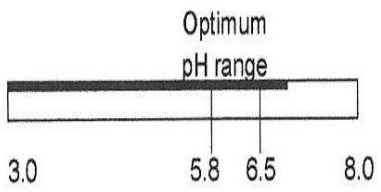
Crop 1- Lawn (not centip.) 0.0 lb per 1,000 sq ft

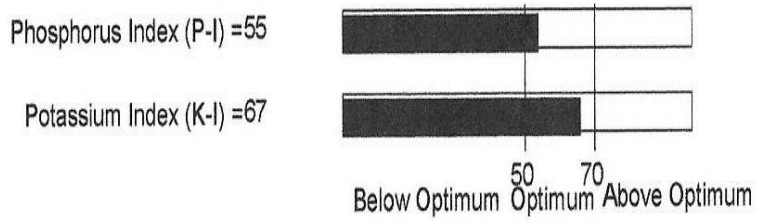
Crop 2- 0.0 lb per 1,000 sq ft

N-P-K Fertilizer Recommendations *

5 lbs per 1000 sq ft 21-0-0 Group D

Test Results:





Additional Test Results:	HM%	W/V g/cm³	CEC meq/100 cm³	Mn-I	Zn-I	Cu-I	S-I
	0.41	0.90	16.9	642	288	130	28

** If you cannot find the fertilizer recommended here, choose one from the same Group (A, B, C or D) listed on the last page of this report.*

Note: This soil test does not measure nitrogen (N) levels. N fertilizer recommendations are based only on needs of the designated crop.

Soil Test Results

Understanding the Soil Report

Lime

Application of lime at the recommended rate will raise soil pH to the optimum range. Do not apply too much lime. When soil pH becomes too high, lowering it is very difficult. Often, the best solution then is to choose plants that can tolerate a high pH.

Choosing dolomitic lime can be advantageous because it contains the nutrients calcium and magnesium. Pelleted lime is easier to spread uniformly than powdered lime.

Lime can be applied at any time of year, but because it reacts slowly, it is best to apply it several months before a new planting. Mixing it into the soil will speed the reaction time. Lime applied to the soil surface takes much longer to correct soil pH.

A surface application should not exceed 60 lb per 1,000 sq ft. If a soil report recommends more than this, apply 60 lb per 1,000 sq ft initially and the rest in similar increments every 6-9 months until the full rate is applied.

Fertilizer

Soil tests do not measure nitrogen (N) since it is very unstable in soils; the N recommendations provided on the soil report are based on plant needs. If soil-test P-I and K-I values are adequate (>50), only nitrogen is recommended- Group D below. A mixed (N-P-K) fertilizer is recommended if P-I and
K-I values are less than optimum- Groups A - C below. Although a specific fertilizer grade may be recommended (e.g., 5-10-10), other equivalent options are likely to be available (e.g., any fertilizer in Group A from Table 1).

Tips on Fertilizer Application

- To determine how much fertilizer to buy, estimate (in feet) the length (L) and width (W) of the area to be treated: L × W = sq ft. Square off curves to make estimates easier. If the recommendation is 20 lb per 1,000 sq ft and your area is 5,000 sq ft, then you need 100 lb (20 × 5) for your 5,000-sq-ft area.
- Calibrate your spreader according to manufacturer settings. Apply half the total rate in one direction; apply the rest at a 90° angle. This cross-hair pattern provides a more uniform application.
- After application, sweep up any fertilizer on hard surfaces and apply to fertilized areas so rainfall does not carry fertilizer to a storm drain.

Table 1. Groups of equivalent fertilizers that supply 1 lb of N per 1,000 sq ft *

Group A: low P-I + low K-I		Group B: low P-I + high K-I		Group C: high P-I + low K-I		Group D: N only	
5-10-10	@ 20 lb	5-10-5	@ 20 lb	8-0-24	@ 12 lb	15-0-0	@ 7 lb
3-9-9	@ 30 lb	18-46-0	@ 6 lb	15-0-14	@ 7 lb	21-0-0	@ 5 lb
10-10-10	@ 10 lb	18-24-10	@ 6 lb	6-6-18	@ 18 lb	16-0-0	@ 6 lb
11-15-11	@ 10 lb	9-13-7	@ 11 lb	5-5-15	@ 20 lb	28-0-4	@ 4 lb
8-10-8	@ 12 lb	9-17-8	@ 11 lb	10-0-14	@ 10 lb	12-6-6	@ 8 lb

* Since these rates supply 1 lb N per 1,000 sq ft, use half the rate if centipede is the grass type.

Report Abbreviations

CEC	cation exchange capacity
Cu-I	copper index
HM%	percent humic matter
Mn-I	manganese index
pH	soil pH
S-I	sulfur index
SS-I	soluble salt index
W/V	weight per volume
Zn-I	zinc index

Time Fertilizer Application to Coincide with Plant Growth Cycle:
Bermudagrass: May, July, Sept
Centipedegrass: May
St. Augustine grass: May, August
Tall fescue: Sept, Nov, Feb
Zoysia: May, July
Flowers/shrubs: prior to planting or during the growing season
Vegetables: prior to planting

A Homeowner's Guide to Fertilizer

Note 4: Fertilization of Lawns, Garden s & Ornamentals

Caring for Your Lawn & Environment

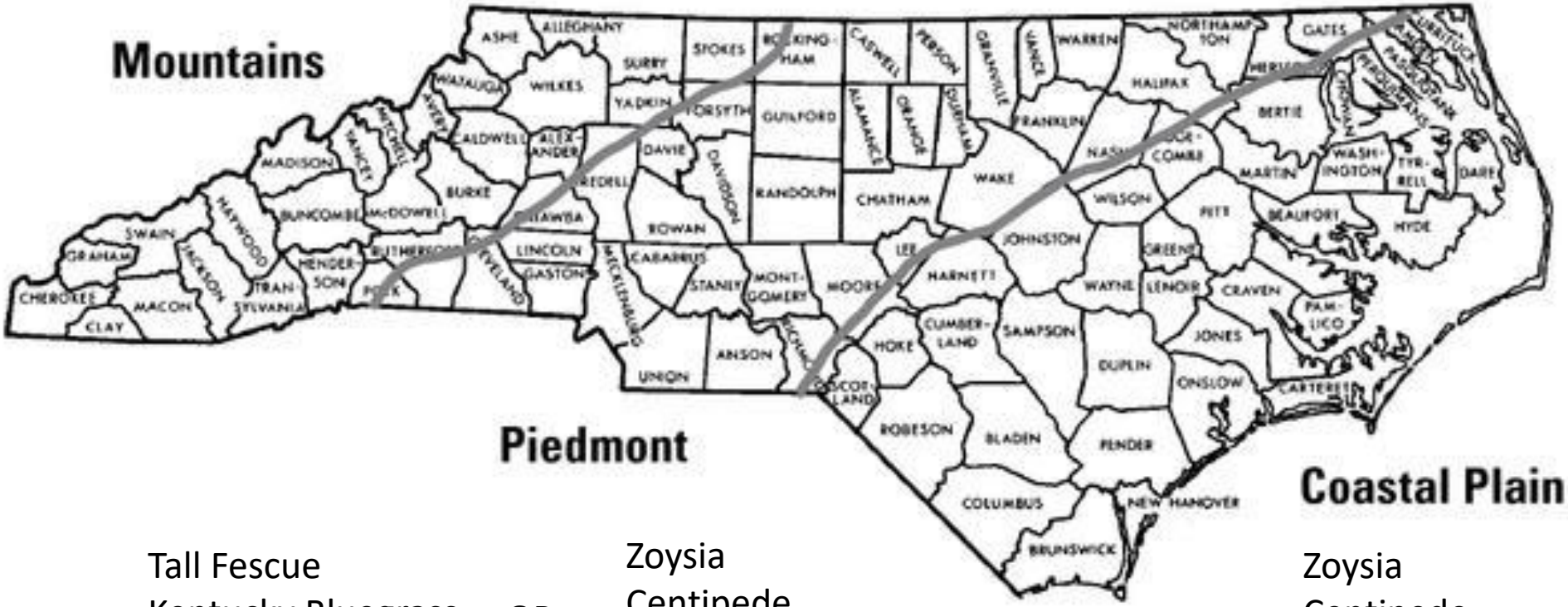
Carolina Lawns

Soil Acidity and Liming: Basic Information for Farmers & Gardeners

Keys to a Healthy Lawn

What Grass to Plant?

Tall Fescue
Kentucky Bluegrass
Fine Fescue



Tall Fescue
Kentucky Bluegrass
Fine Fescue

OR

Zoysia
Centipede
St. Augustine
Bermuda

Zoysia
Centipede
St. Augustine
Bermuda
Tall Fescue

Types of Grasses

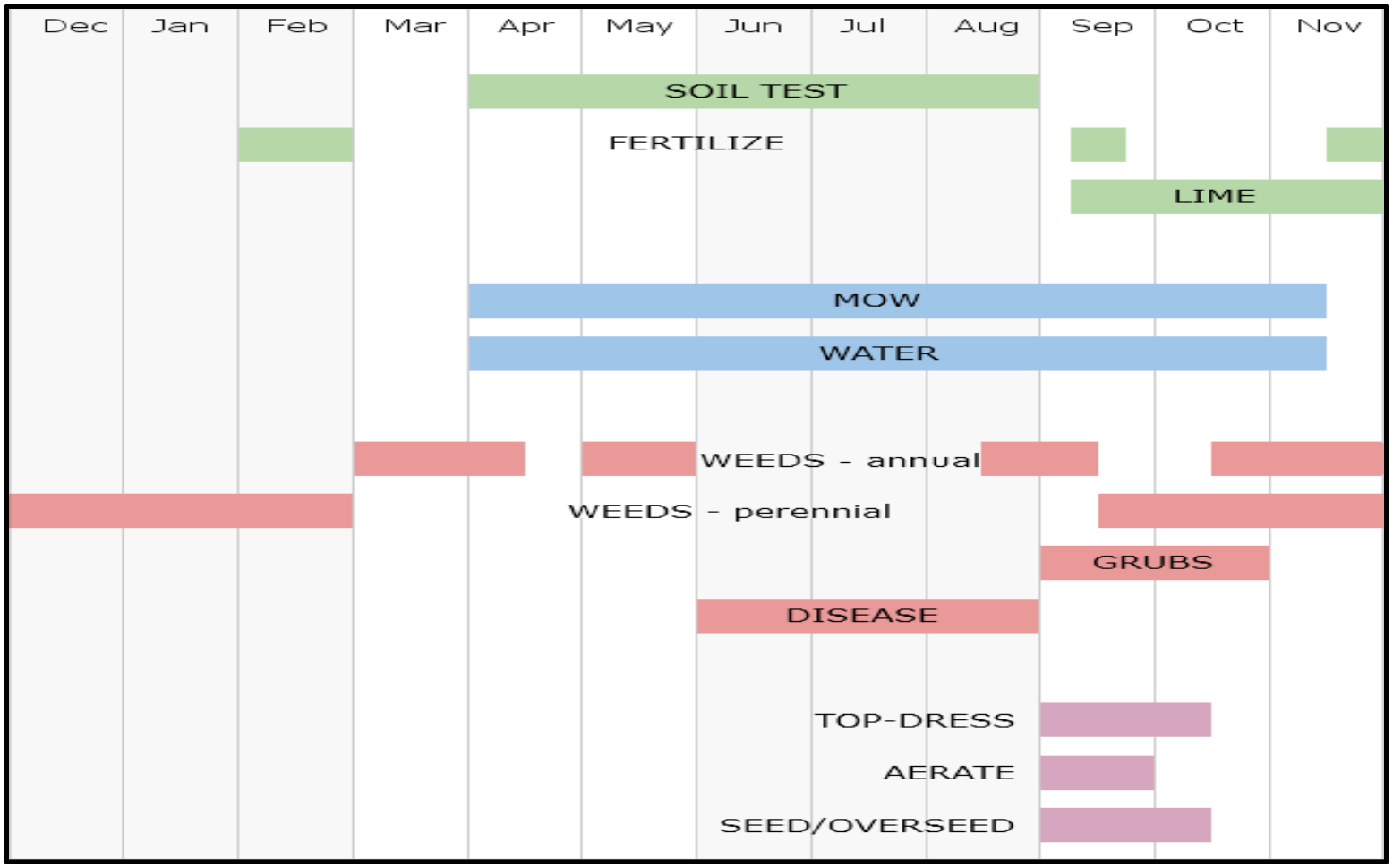
- Cool-Season Grasses
  - Tall fescue, Kentucky bluegrass, fine fescues, and perennial ryegrass
  - Remain green throughout most of the winter
  - Perform best in spring and fall and have a tendency to show signs of stress in the summer
  - Best seeded in early fall, but fair results may be obtained from seeding in early spring
  - Works well in blends

Tall Fescue

- Recommended for this area
- Susceptible to brown patch
- Improved varieties -- more attractive, drought tolerant, disease resistant
- Use mixture of varieties
- Plant seed or sod

Lawn Care Calendar

Cool-Season Grasses



Types of Grasses

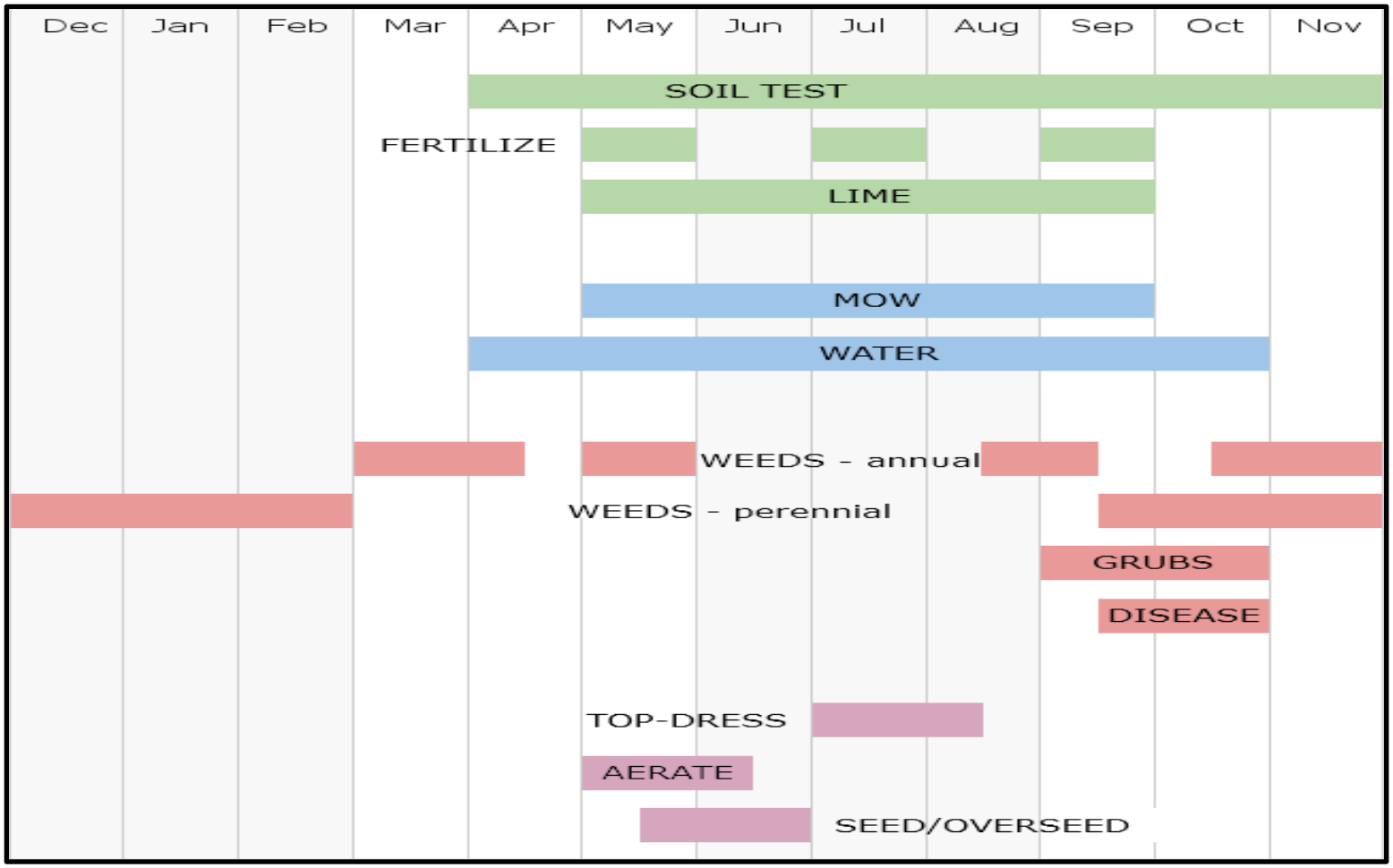
- Warm-Season Grasses
  - Bermuda and Zoysia recommended for this area; others Centipede, St. Augustine are okay
  - Grow best in the summer, go dormant in the fall at the first heavy frost, turn brown, and then green up slowly the following spring
  - Best planted in late spring and early summer
  - Some must be planted either by sod or other vegetative means because seeds either are not available or do not result in uniform stands
  - Usually seeded or planted as a single variety (monoculture) rather than in blends and mixtures

Top 5 Reasons to Plant Warm-Season Turf

1. Attractive golden hue in winter -- nice backdrop for evergreens & berries!
2. Spreading grasses, renovation rarely needed!
3. Looks great in summer!
4. Wide planting window!
5. Drought tolerant!!!

Lawn Care Calendar

Warm-Season Grasses



UNDERSTANDING A SEED TAG

GERMINATION RATE
Germination percentage by seed variety

VARIETY AND KIND
Variety and kinds of grass contained in the product

PURE SEED
Percentage by weight of each grass variety and kind

OTHER CROP SEED
Other seeds that comprises of 5% or less of the product

INERT MATTER
Non seed materials such as mulch or fertilizer

WEED SEED
Percentage of weed seed contained in the product identified by state

NOXIOUS WEEDS
Number of noxious weed seeds contained per pound. Noxious weeds are regulated and may be restricted by state.

GUARANTEED ANALYSIS
Guaranteed analysis for fertilizer containing products

LOT NUMBER
Production lot identification number

TEST DATE
Germination test date

SELL BY DATE
Sell by date variable by state

PENNINGTON
THE GRASS SEED PEOPLE®

OneStep Complete Seeding Mixture

For Sun and Shade Areas .6 - 0 - 0
Sun and Shade Mixture

MAT: 100520281
NET WT: 5 POUND

PURE SEED	VARIETY KIND	GERMINATION	ORIGIN
4.00%	REBEL XTREME TALL FESCUE	85%	OR
1.80%	PENNINGTON ATF1376 TALL FESCUE	85%	OR
1.70%	VIRTUE II TALL FESCUE	85%	OR
1.00%	BLUE BONNET KENTUCKY BLUEGRASS	80%	WA
0.80%	PENNINGTON ASC295 RED FESCUE	85%	OR
0.70%	SURVIVOR CHEWINGS FESCUE	80%	OR

0.09% OTHER CROP SEED
89.90% INERT MATTER*
0.01% WEED SEED

*(CONSISTS OF 84.50% MULCH, 5.00% FERTILIZER, 0.40% INERT FROM SEED)

NOXIOUS WEED: NONE FOUND PER POUND

GUARANTEED ANALYSIS: .6 - 0 - 0

Total Nitrogen (N)..... 0.60%
0.60% Urea Nitrogen
Derived From: Urea

SOIL AMENDING GUARANTEED ANALYSIS

Active Ingredients:
84.50% Mulch
Soil Amendment Inert Ingredients:
10.50% Seed
5.00% Fertilizer

INFORMATION REGARDING THE CONTENTS AND LEVELS OF METALS IN THE PRODUCT IS AVAILABLE ON THE INTERNET AT:
http://www.aapfco.org/metals.htm

LOT# MH14WWS001

TEST DATE 12-14

In AK, AZ, CA. CO, CT, DE, ID, IL, MD, MN NC, ND, NE, NH, NJ, NV, NY, OH, OR, PA, SC UT, VA, VT and WA SELL BY: 03/31/2016
In MA, MT, SD, WI and WY SELL BY: 12/31/2015
In FL SELL BY: 07/31/2015
In all other states SELL BY: 09/30/2015

GUARANTEED BY:
Pennington Seed, Inc. P.O. Box 338 Greenfield, MO 65661

Keys to a Healthy Lawn

Plant Properly

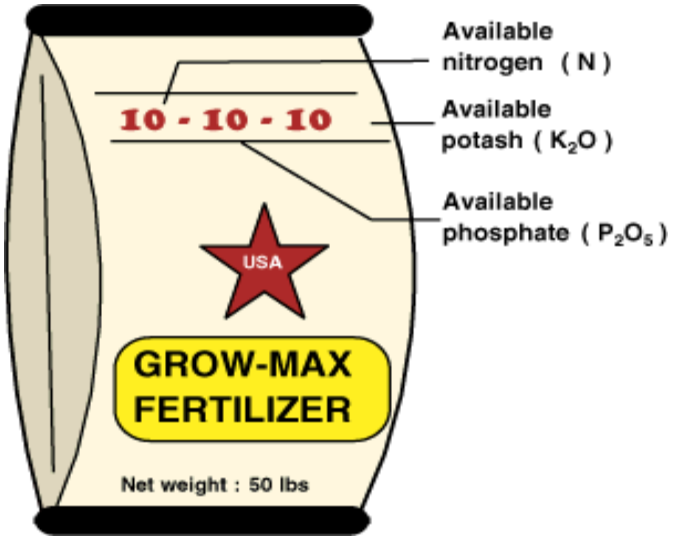
- Soil Sample!
- Add top soil (if needed)
- Spread Lime/Fertilizer
- Rake Smooth
- Even distribution of seeds
- Soil/Seed Contact
- Straw mulch – (1 bale/1,000 sqft)

Keys to a Healthy Lawn

Fertilize Properly

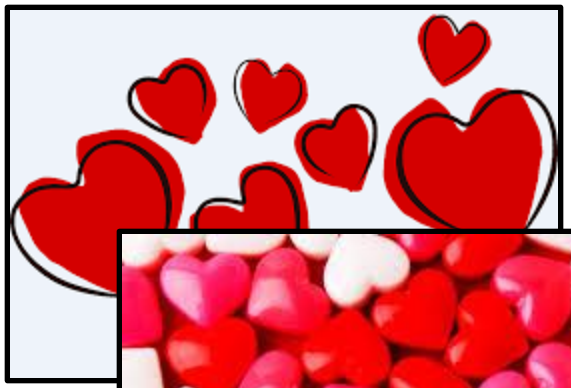
- Soil Sample!
- Product
- Timing
- Amount
- Method

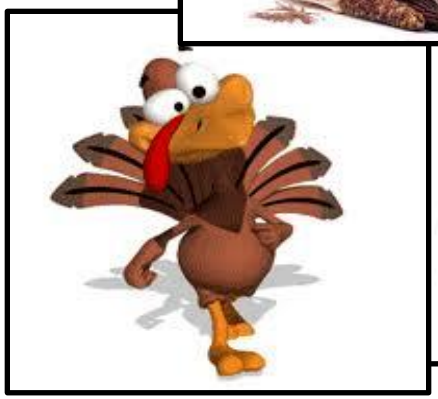
Understanding a Fertilizer Label



- Generally referred to as N-P-K; Nitrogen, Phosphorus, Potassium
- A bag of 10-10-10 fertilizer contains 10 percent nitrogen, 10 percent phosphate and 10 percent potash
- The remainder of the bag is filler
- ***Up-Down-All Around!***

When to Fertilize Cool-Season Grasses





Why Apply Lime?

- Based on soil test report recommendation
- Most Piedmont soil is acidic about 5.5 pH
- To raise soil pH
- All turf grass (except Centipede) performs best between 6.0 and 7.0 pH
- On average -- every 3 years
- Pelletized easier to handle

Keys to a Healthy Lawn

Mow Properly

- Mow frequently so that no more than 1/3 of the leaf is removed at one cutting
- Sharp blade; “cut” not “tear”
- Leave clippings on lawn
- Mowing too low is setting yourself for weeds
- Correct height

Key to long-term survival of turf

Mowing Height

Species	Fescue	Bermuda	Centipede	Zoysia
Cut to	3-3.5”	1”	1”	1”
Max Height	5”	2”	1.5-2”	1.5-2.0”

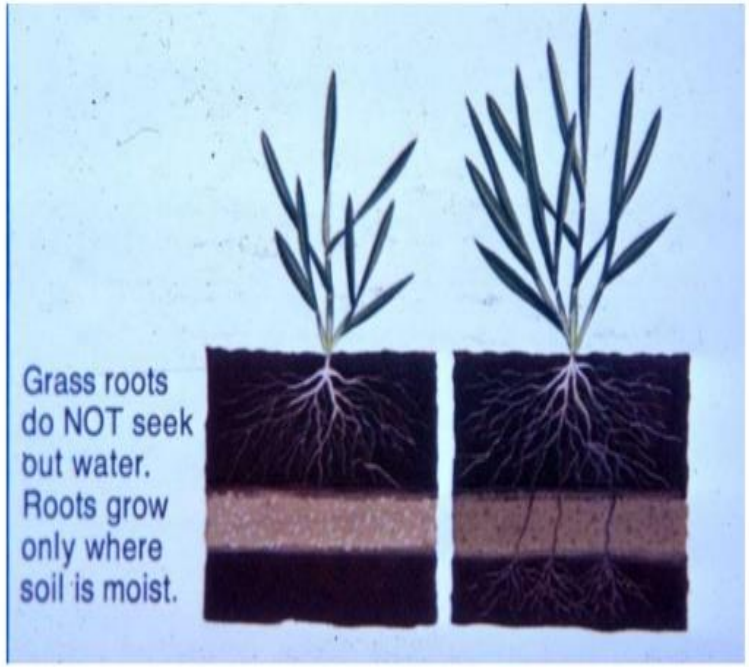
Keys to a Healthy Lawn

Water Properly

- Difficult to effectively irrigate without a permanent system!
- Early morning best for watering turf
- Dependent on temperature, rainfall, soil, etc.
- Allow to go dormant and water every 3 weeks about ¼ inch

Improper watering results in wasted resources, added cost and unhealthy plants

NC STATE UNIVERSITY



Aeration

- Soils that are subject to heavy traffic are prone to compaction
- To help prepare soil prior to over seeding
- Use a device that removes soil cores
- Aerate when the lawn is actively growing
  - Cool season grass in fall
  - Warm season grass in spring

Over seeding Considerations

- If turf is thin (but viable)
- No major weed problems
- Correct time for cool-season grasses
  - Best seeded in early fall
  - Fair results from seeding in early spring
- Seed to soil contact
- Water frequently after seeding
- Better to completely renovate??

Why Might Renovation be Needed?

- Soil compaction?
- Poor maintenance?
- Mowing too low?
- Excessive shade?
- Low pH or fertility problem?

RESOLVE THESE PROBLEMS FIRST!

Integrated Pest Management

- Understand the effects of chemicals on our environment
- Balance all available control methods to keep pests from reaching damaging levels
- Plant the best-adapted grass and then properly water, mow, and fertilize
- If chemical control is necessary, select the safest effective pesticide and follow label recommendations.
  - Chemicals should be applied when the pest is most susceptible
  - Treat only those areas in need
  - Regard pesticides as only one of many tools available in lawn care.
- More time and labor are required
- High expectations may not be met when pest pressures and environmental conditions are severe.

A healthy lawn can tolerate low levels of pests and makes the area a good habitat for beneficial organisms that help control pests.

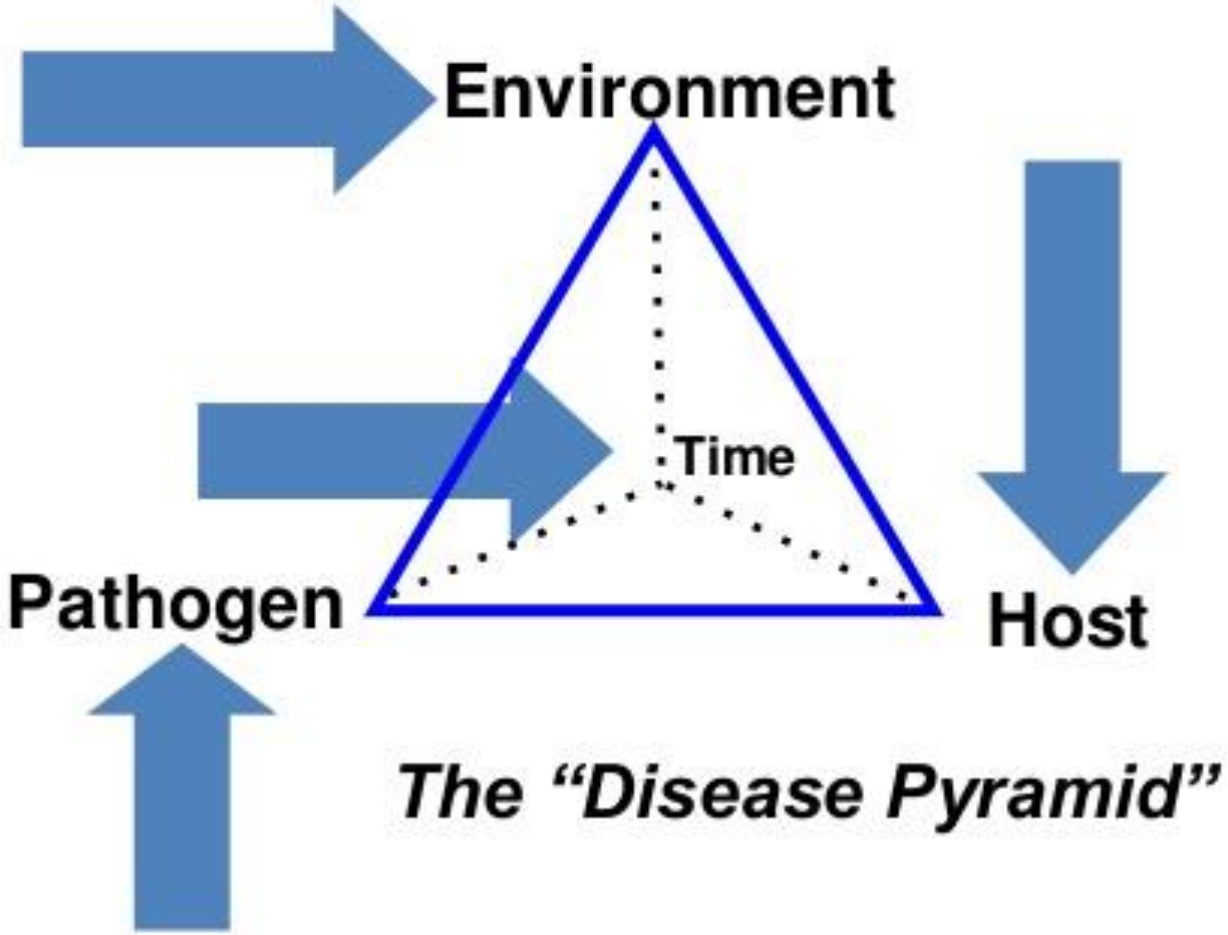
Common Pests

- White Grubs
- Leafhoppers/Spittlebugs
- Sod Webworms

- Ants
- Army/Cutworms
- Bees/Wasps

Plant Diseases

To have a disease you need all four of these.



The "Disease Pyramid"

Diseases of Turfgrasses

Common Diseases

(page 65)

- Most common disease of fescue
- Cool-season grasses: warm, humid weather
- Warm-season grasses: cool, wet weather
- Avoid high nitrogen
- Avoid excessive water
- Fungicides can help

Weed Management

- ***Weeds are in the eyes of the beholder!!!***
- Many weeds in a lawn can be frustrating to a homeowner, but having some tolerance for weeds keeps chemical use to a minimum and maintain your SANITY!
- Tolerating some weeds can also improve soil conditions and help support the ecosystem.
  - Dandelion have taproots that break up heavy clay soil. Their blooms are food for many pollinators such as honey bees and butterflies.
  - Clover is a legume and so has nitrogen-fixing bacteria in the roots, and its blossoms are a favorite of honey bees.

Pre-emergent Herbicides

- Use BEFORE seeds germinate
- Pre-emergent herbicides stop all seeds from emerging from the soil
- Do not apply them when trying to renovate a lawn with new grass seed
- For summer weeds (i.e., crabgrass or goosegrass) apply in early to mid-spring
- For winter weeds (i.e., bluegrass or henbit) apply in early fall

Post-emergent Herbicides

- Used for actively growing weeds
- Temperatures between 60-80 degrees
- Apply before mowing
- Post-emergent herbicides
  - ***Selective*** herbicides affect only certain types of plants OR ***Nonselective*** herbicides kill any growing plant
  - ***Contact*** herbicides damage any tissue they come into contact with OR ***Systemic*** herbicides translocate through a plant and can be more effective against older weeds

Weeds

The primary and most effective weed control tactic in a lawn is proper mowing. In fact, it has been estimated that regular mowing eliminates some 80 percent of weedy species.

— Michigan Cooperative Extension

- If weeds are a problem, see if they indicate an underlying issue and try to resolve it.
  -**broadleaf plantain** — compaction
  -**small hop clover** — dry soil & low nitrogen
  -**annual bluegrass** — overly wet soil, compaction & excess nitrogen
  -**moss** — excess shade, compaction & poor drainage
- Some areas are simply not suited to turf grass
- Consider non-turf alternatives

Weed Definitions

- **Rhizome**
  - An underground creeping stem that can produce roots and shoots at each node.
- **Stolon**
  - An above-ground creeping stem that can produce roots and shoots at each node.
- **Tuber**
  - An underground stem modified for food storage that is attached to the root system as found in yellow nutsedge.

Microstegium Vimineum

Japanese Stilt Grass

- Roots at nodes; elongates quickly in fall, then produces seed banks which stay viable in the soil for many years.
- Dies back in the fall. Seeds germinate in late winter/early spring.
- The sticky, tiny seeds can be spread into other areas on the fur and hooves of animals (deer), by water, shoes, and clothes.
- Hand pulling or using an appropriate weeding tool are the primary means of mechanical weed control in lawns.
- Germinates before most other weeds (i.e., crab grass). Apply a pre-emergent product in early March.

POA Annua

Annual Bluegrass

- Seed; Seeds; SEEDS!
- Cool, moist conditions; compacted soil; close mowing; high levels of nitrogen. Avoid overwatering and applying too much nitrogen fertilizer.
- Dies out in summer leaving huge patches of dirt in lawn
- Hand Pull?
- Seeds germinate in late summer to early September. Control with a preemergent applied in mid-August/early September. Some crabgrass preemergent products are also labeled for Poa annua

Cynodon dactylon

Bermuda grass

- Creeping warm-season turf grass that spreads by both rhizomes and stolons
- Germinates in early summer around May to June and is highly invasive
- Requires control in both landscape beds and stands of other turf grass species

-Physical hand removal is possible in landscape and ornamental beds

-Hand-pulling from competing turf grass stands is not a practical option

-A grass herbicide such as fluazifop-p-butyl may be sprayed over-the-top of many ornamental species;

-A non-selective herbicide such as glyphosate may be spot-sprayed

Oxalis corniculata

Creeping Woodsorrel

- Creeping summer perennial with a slender taproot
- Germinates in spring around March
- Spreads by seeds
- Easily removed by hand when plants are young
- Herbicide application to plants that are actively growing and in the seedling to flower stage of growth

Digitaria sanguinalis

Crab Grass

- Summer annual that germinates when soil temperatures reach a consistent 55 deg
- Do not seed or aerate or verticut when conditions are ripe for the germination of crabgrass
- Raised mowing height may help prevent the establishment of crabgrass by providing shade from sunlight
- When crabgrass is going to seed, lower the mowing height and collect clippings to prevent seed establishment
- Use a pre-emergence herbicide or after germination, use a selective grass herbicide

Geranium molle

Dovefoot Geranium

- Biannual plant that spreads by seeds which germinate fall to early spring
- Grows best on nutrient-poor soils, deficient of moisture
- Can be pulled out by hand prior to seed production
- Fertilize with a balanced fertility program to keep the turf thick. Irrigate on a regular basis to avoid drought stressing the turf.
- Herbicide application to young plants that are actively growing, prior to late spring flowering

Cyperus rotundus

Nutsedge

- Sedges are not grass plants, but seedlings may be mistaken for grass
- Underground root systems containing rhizomes and underground tubers which accomplish most of the reproduction.
- Spread mainly by germinating underground tubers, which are the only part of the plant that over-winters
- Keep turf grass sites stress-free and vigorously competitive with sedges
- Herbicide when nutsedge is actively growing

Cardamine hirsuta

Hairy Bittercress

>Annual weed which is found on wet disturbed areas
>A winter or summer annual depending on its location
>Germinates early winter around November
>Physical hand removal is possible in landscape and ornamental beds
>Herbicide application when Hairy Bittercress is young and actively growing

Chamaesyce maculata

Spotted Spurge

- Summer annual that germinates in mid spring and flowers from June to September
- Can tolerate compact soil conditions and is often found invading high traffic or otherwise stressed turf areas
- Not generally found in dense, healthy stands of turf grass
- Pre-emergence herbicide may prevent some spurge germination
- Broadleaf herbicide to spurge that is actively growing and in the four-leaf to flower stage of growth

Ornithogalum umbellatum

Star of Bethlehem

- Perennial weed developing from a bulb
- Flowers are present in the late spring. The plant dies back to the bulb after flowering.
- All parts of the plant are poisonous
- Physical hand removal is possible in landscape and ornamental beds
- Herbicide application to Star-of-Bethlehem that is actively growing and in the seedling to flower stage of growth

Fragaria virginiana

Wild Strawberry

- Low trailing winter perennial that spread by stolons
- Each plant forms multiple runners which root at the nodes and form new plants.
- It is difficult to physically remove plants from turf situations. Runners may link into multiple plants several feet away. If physical removal is attempted, take extreme care to remove all plants and plant parts.
- Herbicide application to wild strawberry that is actively growing and in the leaf to flower stage of growth

Viola papilionacea

Wild Violet

- Winter perennial that germinates around November and has flowers from March to June
- It can have a taproot or a fibrous root system, and also can produce rooting stolons and rhizomes
- Do not use as an ornamental ground cover without establishing physical barriers to prevent invasion of turf grass
- Can be physically removed by digging but care must be taken to remove all plant roots to prevent reestablishment.
- Requires a series of post-emergence herbicide applications

Resources

- NC State Extension Lawns and Turf Management https://gardening.ces.ncsu.edu/gardening-plants/lawns-2/
- North Carolina Extension Gardener Handbook “Lawns” https://content.ces.ncsu.edu/extension-gardener-handbook/9-lawns#section_heading_6628
- “Carolina Lawns: A Guide to Maintaining Quality Turf in the Landscape” https://content.ces.ncsu.edu/carolina-lawns
- “Master Gardener Lawns” Cliff Ruth https://www.slideshare.net/bmrenner/lawn-presentation-for-master-gardeners
- “Lawn Establishment, Maintenance, and Renovation” Michelle Wallace https://carteret.ces.ncsu.edu/wp-content/uploads/2015/03/lawncare.ppt-Read-Only.pdf?fwd=no

Questions?

Back-Up

Cool-Season Grass Comparisons