



## Grass plant

- Inflorescence
- Spikelets made of individual florets
- Flower is key characteristic to ID, so to ID a grass, usually need mature seed head



## So it is easiest to Identify by

- Growth habit
  - Tillers (bunch grass)
  - Rhizome (spreading grass)
  - Stolon (running grass)
- Environmental requirements
  - Cool Season
  - Warm Season

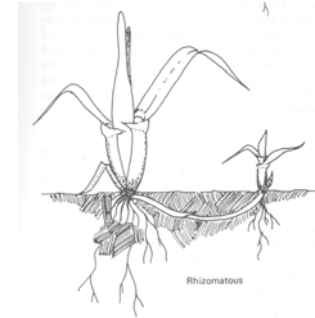
## Growth habits

- Tillers – “bunch grass”
- Eg. Fescue



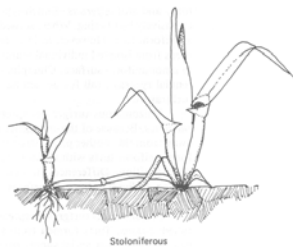
## Growth habits

- Rhizome
- Eg. Bluegrass



## Growth habits

- Stolon
- e.g. Centipede, Bermuda



## Environmental requirements

- Cool
  - Thrive between 50-75 degrees
  - Requires irrigation
  - Sun or shade
  - Rye, Bluegrass, Bentgrass and Fescue

## Environmental requirements

- Warm
  - Thrive between 85-95 degrees
  - Drought tolerant
  - Full sun
  - Zoysia, Bermuda or Centipede

## We live in a 'transition' zone



## Not all of Virginia IS Transitional



## Tall Fescue –



- cool season
- 75 – 85% grow it
- Bunch-type
- Deep-rooted for drought tolerance
- Coarse texture, wide blade (breeding varieties for thinner blade)

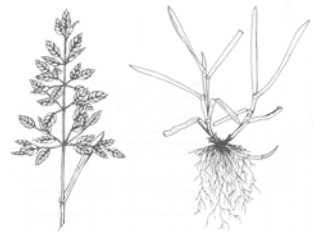
## Tall Fescue

- Grows in from full sun to lightly dappled shade
- Fertility range is from kinda' poor to doing better
- 3-4 week germination



## Kentucky Bluegrass

- Cool Season
- Spreading
- Strong rhizomes
- Fine texture, thin blade, dark green
- Requires full sun
- Some are shade tolerant, but they're stressed



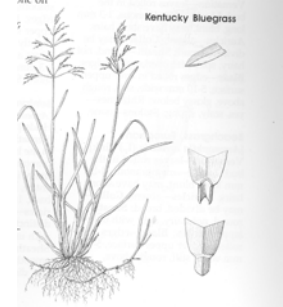
## Kentucky Bluegrass

- Shallow roots - Requires more moisture
- with 2 weeks of dryness, goes into dormancy
- With 4 weeks of dryness, some dying
- Some insect and disease problems
- Takes up to 3 weeks to germinate



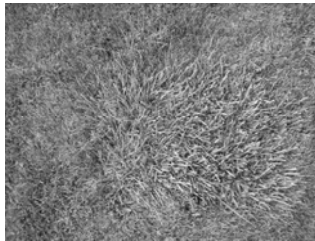
## Kentucky Bluegrass

- Identification  
Look at tip for canoe point = Bluegrass



## K-31

- Not Kentucky Bluegrass, but a tall fescue developed in 1931
- Coarse texture
- “Contractors’ Blend”



## Perennial Ryegrass

- Bunch
- Texture and color like Kentucky Bluegrass
- Special use-type grass



## Perennial Ryegrass



- Doesn't tolerate hot, dry periods
- Is durable
- Germinates quickly (found as part of blend to make us feel better)

## Creeping Red Fescue

- Dry soil
- Shade tolerant
- In the “Shady Blend”
- Low fertility
- “Creeping” = rhizomatous



### Creeping Red Fescue

- Fine texture, doesn't stand up to traffic
- Flops, never get a nice clean-mowed appearance



### Other Fine "Shady" Fescues

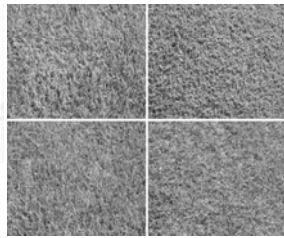
- Chewings
- Hard



Sheep or Sheeps

### Zoysia

- Warm season
- Aggressive stolon
- Propagated by plugs

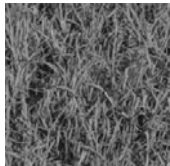


### Bermuda grass

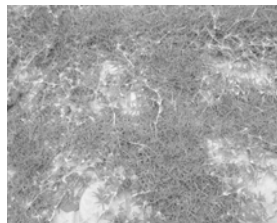


- Almost a weed for long stolons
- Thrives under hot dry conditions
- Straw-colored in winter
- Does well under low fertility
- Chokes out weeds
  - Few diseases
- Less clippings

### Bermuda grass



- Almost a weed for long stolons



### Bermuda grass continued

- propagated vegetatively plugging or sprigging
- Expense of establishment
- Seeded varieties slow to germinate, have a low germination rate
- Bermuda grass – use on ball fields
- It's at its most northernmost edge here (new seed coming)
- Can be overseeded with perennial rye for fall color
  - @PW Waterpark

## Cultivars

pg 349

- National Turfgrass Evaluation Program
- Haymarket, Loudoun, Charlottesville, Blacksburg
- Monthly readings, numerical rating for 3 years
- If gets a 'superior' rating, goes on list
- DC, MD & VA participate
- Check the recommendations
- How to use this sheet

Virginia Cooperative Extension  
www.vce.vt.edu

**2009-2010 Virginia Turfgrass Variety Recommendations**  
Mike Gosley, Turfgrass Specialist, Virginia Tech  
Whitney Aldrich, Research Associate, Virginia Tech

The Maryland Virginia Turfgrass Variety Recommendation Work Group meets each Spring to consider the previous year's data from Virginia and Maryland National Turfgrass Evaluation Program (NTEP) tests and to formulate these recommendations. Virginia and Maryland variety recommendations are essentially identical except for specialized grasses and research situations that differ due to adaptation and state regulation. To qualify for this recommended turfgrass varieties: 1) must be available as certified seed or, in the case of vegetative varieties, as certified plugs or sod; 2) must be tested at sites in both Virginia and Maryland; 3) must perform well, relative to other varieties, for a minimum of five years to make the list as a "promising" variety and for three years to make the recommended category. All test locations in Virginia and Maryland are controlled in making these recommendations. The Virginia Civil Improvement Association (VCIA) set the turfgrass standards in 1998 and requires that seed in the VCIA Sod Certification program. All seed or vegetative material must be certified and meet minimum quality standards prescribed by the VCIA. Many seedling specifications for municipalities, schools, state and government agencies, business, athletic, and professional organizations state that varieties used for turfgrass establishment must come from this list and that seeds or sods must follow the guidelines for certified seed production. Specifications for open highway seedings are developed separately and may require some species and/or varieties not normally recommended for uses other than roadside seeding. Seed availability may vary between turf seed suppliers. Some species and varieties may have limited adaptation.

**Kentucky Bluegrass** - Individual varieties selected must make up not less than 10%, nor more than 35% of the total mixture on a weight basis. All varieties must be certified. Varieties can be made from Category I (same or better components of Categories I, II, and III) or as noted. Kentucky Bluegrass listed as "Promising" Category II below can substitute for not less than 20% of the seed by weight.

**Category I - Recommended Kentucky Bluegrass Varieties (85-100% of seed by weight)**

Award, Azevora<sup>®</sup>, Beyond Bonanza<sup>®</sup>, Bismarck, Cabernet<sup>®</sup>, Courtyard, Diva, Everest<sup>®</sup>, Everglade, Excursion, Gleaner<sup>®</sup>, Impact, Atlas, Liberator, Midnight, Monarch<sup>®</sup>, NoCresty, NoCresty, Protection III, Captain, Lanes, Raven, Duke, Sultan, Impact, Total Edge<sup>®</sup>, and Touche.

**Category II - Promising Kentucky Bluegrasses (10-35% on a weight basis)** - These grasses have performed in the top statistical quality category for a minimum of 2 consecutive years in Virginia and Maryland trials. Seed may be difficult to locate for some cultivars. Note: Durabark, Thermablow, and Thermablow Blue are commonly referred to as Hybrid Bluegrasses, but they are certified by VCIA as Kentucky Bluegrasses. To date they have had better performance in traditionally warmer areas of Virginia.

Alexis II, Atlas, Azev, Bonanza, Belissimo, Bevilacqua, Bluestone, Doublet, Emblem, Everglade, Glimmer II, Grande, Mystic, NoCresty, NoCresty, Phasos, Rhythm, Solar Edge, Thermablow, Thermablow Blue, Wild Horse, Yankee, Zorba

2009 Virginia Polytechnic Institute and State University 2007-1397

## How can I choose? Pg 349-351

- There is no one best grass seed – look at current turfgrass selections handout
- Want Category 1
- How much work?
- Environment
- What are expectations?

**Tall Fescue** - For tall fescues, both recommended and promising varieties can be used in the VCIA Sod Certification Program.

### Category I - Recommended Tall Fescue Varieties (90-100% on a weight basis)

2<sup>nd</sup> Millennium, Avenger, Biltmore, Bingo, Blackwatch, Bravo, Cochise II<sup>®</sup>, Cochise III, Constitution, Coyote II, Crossfire II<sup>®</sup>, Davinci<sup>®</sup>, Daytona<sup>®</sup>, Endeavor<sup>®</sup>, Falcon IV, Fidelity, Forte, Good-En<sup>®</sup>, Grande<sup>®</sup>, Grande II, Greenkeeper WAF, Guardian 21, Houndog 5, Hunter, Inferno, Justice, Magellan, Masterpiece, Matador<sup>®</sup>, Matador CT<sup>®</sup>, Onyx<sup>®</sup>, Padre, Picasso<sup>®</sup>, Penn 1901, Raptor, Rebel Exerds, Regiment II, Rembrandt<sup>®</sup>, Southern Choice II<sup>®</sup>, SR 8250<sup>®</sup>, Taos, Tarheel, Tarheel II, Tempest, Titanium, Tombstone, Turbo, Ultimate<sup>®</sup>, Watchdog, and Wolfpack.

### Category II - Promising tall fescue varieties (may be 90-100% of the mixture on a weight basis)

3rd Millennium SRP, Aggressor, Aristotle, AST 7002, AST 7003, AST 9003, Braveheart, Bullseye, Cannavaro, Catalyst, Cezanne RZ, Cochise IV, Compete, Escalade, Einstein, Essential, Faith, Falcon V, Falcon NG, Fat Cat, Finelawn Xpress, Firecracker LS, Fienza, Gazelle II, Greenbrooks, Guardian 21, Hemi, Hudson, Jamboree, Lindbergh, Monet, Mustang 4, Ninja 3, Raptor 2, Rebel IV, Renovate, Reunion, Rambler SRP, Rocket, Shenandoah, Shenandoah Elite, Sidevinder, Speedway, Spyder LS, SR 8550, SR 8500, SR 8550, Statton II, Tahoe II, Talladega, Terrier, Titanium, Toccoa, Traverse, Trio, Tulsa Time, Umbrella, Van Gogh, Wolfpack II

## Buying Seed

STAFFORD HIGH ABUSE MIX

LOT #	M12419	DATE TESTED	DOMESTIC ORIGIN
CONTAINS			
REBEL 3D	79.12 %	90.00 %	ORIGIN
PALMER II	9.70 %	90.00 %	ORIGIN
GEORGETOWN	9.92 %	80.00 %	WASHINGTON
OTHER CROP SEEDS:	0.09 %		
INERT MATTER:	1.17 %		
WEED SEEDS:	00.00 %		

UNDESIRABLE GRASS SEED PER LB.

LOFT SEED / SEED CORPORATION OF AMERICA  
4784 HOLLINS FERRY ROAD  
BALTIMORE MD 21227  
AMS: 598 NET WT. 50.00 LBS.

- Pays to spend the extra \$ to get good seed
- Germination rate
- Variety
- Weeds
- Noxious weeds
- Date

## Should I overseed or should I renovate?

- New Construction – means new turf
- 50% rule
- Don't obsess
  - Mostly green rule or "Dashboard Rule"

### Should I overseed or should I renovate?

- 50% rule

### Should I overseed or should I renovate?

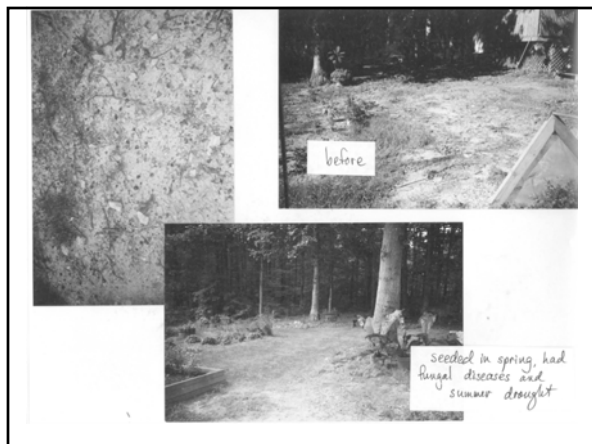
- 50% rule

### Should I overseed should I renovate?

- Don't obsess
  - Mostly green rule or "Dashboard Rule"

### Should I overseed or should I renovate?

- Don't obsess
  - Mostly green rule or "Dashboard Rule"
  - This isn't Augusta
    - If it is we would have greens crews
    - And THEY would know what to do
    - Handout TurfTips: How can I plant a lawn?



### What does Grass need to Grow?

- Sunlight
  - 6 hours direct = sunny
  - Shady blend is .....
- Moisture
- Neutral pH
- Reasonable fertility

## Assess the yard

- Trees
- Soils
- Soil test
- Sunlight
- The client's desires
- The client's realistic labor input.

## How to plant?

- Seed
- Sod
- Plug
- Sprig

## New Lawns

- Soil test
- Kill off existing weeds
  - Insolation
  - Herbicide – watch your timing
- Amendments can be added all at once
- Till
- Smooth – roll
- Seed – roll - mulch
- Water – Water -

## Renovating lawns

- Soil test
- Soil amendments as prescribed
- Herbicides if needed – watch the timing
- Rough up the soil
- Seed – mulch
- Roll
- Water

## How Much Seed?

Grass Name	Warm or Cool Season	Planting date Northern Piedmont, areas in and west of the Blue Ridge	Planting date Southern Piedmont and Eastern Virginia	Seeding Rate for Establishment <sup>1</sup> Lbs per 1000 square feet	Seeding rate for overseeding Lbs per 1000 Square feet	Sprigging rate for establishment Bushels per 1000 square feet	Plugging rate for establishment Plugs per 1000 square feet
Kentucky Blue Grass	Cool	Aug 15 to Sept 15 or March to early April	Sept 1 to Oct 15 or Feb and March	4-6	2-3	Not recommended	Not recommended

## Managing weeds

- Use the magic bullet
- There is no magic bullet
- Page 357-359

## Managing weeds

- Cultural control
- Maintain density through proper mowing, fertilization
- Hand digging weeds
- Chemical control

## Managing weeds

- Identify the weed
- Herbicide selection based on mode of action
- And weed life history
  - Annual weeds – use pre-emergent
  - Perennial weeds – use post-emergent

## Method of application and use

- Pre-emergent (prevention)
- Post-emergent (reactive, but may only require spot treatment, and less herbicides)

## Crabgrass for example

- Summer annual
- Germinates in soil temperature above 50 degrees
- Full sun
- Dies with first frost
- Control with pre-emergent
- Apply prior to germination
- Pre-April 1 (not *Forsythia* but Dogwood)

## PMG for Crabgrass

Table 5.3 - Annual Grass Control with Preemergence and Postemergence Turfgrass Herbicides<sup>1</sup>

Herbicide	Crabgrass	Goosegrass	Annual bluegrass	Foxtail	Sandbur	No. of annual treatments <sup>2</sup>
<b>Preemergent</b>						
Benflin	S	I	I	S	I	2
Bensulide	S	R	S	S	—	1-2
DCPA	S	I	I	S	I	2
Dithopyr	S	I	I	S	—	1
Oryzalin	S	I	S-I	S	S-I	2
<b>Benflin +</b>						
Oryzalin	S	I	S-I	S	S-I	1
Chlorazon	S	S	I	S	I	1
<b>Bensulide +</b>						
oxyflorfen	S	S	S	S	I	2
Flufenacet	S	I	I	S	I	2
Proflumarin	S	I	I	S	—	1
<b>Benflin +</b>						
trifluralin	S	I	S-I	S	S-I	2
Siduron	S	R	R	S	—	2
<b>Postemergent</b>						
Dithopyr	S	I	I-R	S	—	1
DSMA, MSMA	S	I-R	R	S	I	2-6
Fluroxypyr	S	I	I-R	S	—	2
Dithopyr +	S	I	I-R	S	—	1
MSMA +	S	I	I-R	S	—	1
Dithopyr +	S	S-I	I-R	S	—	1

<sup>1</sup>S=seed susceptibility, Intermediate tolerance, good control at times with high rates, sometimes poor, may require more treatments per year; R=resistant in most instances, poor control usually less than 70%.

<sup>2</sup>Actual treatment requirement to give listed performance rating. Lower label rates require additional applications.

## Pre-emergent

- Look in the PMG –
- Balan (benflin) -2 application per year
- crabgrass, goosegrass, annual blue, foxtail –
- betasan (Bensulide)- 1 – 2 applications
- If people unhappy, they probably didn't put down 2<sup>nd</sup> application
- Barricade (proflumarin) – 1 application depending on rain
- Tupersan (siduron) -Seed can germinate in this -Reapply in 30 days– can kill bermudagrass!
- Look at grass tolerance– Balan can kill fine fescue!!

## e.g. Crabgrass – pg 5-9

### Preemergence Control of Crabgrass

Annual grasses are effectively controlled with preemergence and postemergence herbicides. Crabgrass, foxtail, and other weeds are effectively prevented by a number of preemergence compounds. Each basic herbicide ingredient may be formulated into many products (concentrates 25 or more). With a wide variety of formulations, it is important to follow label instructions carefully. Preemergence herbicides are applied in early spring before seedling crabgrass emerges. Generally, it is too late for effective control if you see the seedling emerging in the lawn. Preemergence herbicides applied in spring will be sufficiently degraded or lost during the summer to allow fall seedling of this turfgrass species.

### Basic Choices of Preemergence Herbicides

**Beetle (Bifenox):** Apply 2-3.4 lb of 2.5% granular granules per 1000 sq ft in late winter or early spring before crabgrass seedlings emerge. A second application after 2 months may be required to maintain effective crabgrass control into late summer and fall.

**Benlate (Bifenox):** Follow label directions for proper rate. Stipagronins are 7-12 oz of a 4 Brigid EC, 3-4 lb of 7% gran, or 1.8 lb of 12.1% gran per 1000 sq ft for crabgrass control. When the low label rate of 7-12 lb active ingredient (a.i.) per acre (0.5 oz of a 4 Brigid formulation) is used, a second application may be desirable to prevent late germinating crabgrass establishment. This application may be made about 4 months after the initial treatment.

**Dithiopyr (Dimension):** Use 1-1.2 oz of a 4 Brigid EC per 1000 sq ft for preemergence crabgrass control. The most optimum timing is at crabgrass germination period. It may be used in warm and cool season turfgrasses. Dimension is for use by professional turfgrass applicators only. Early preemergence control of crabgrass (before crabgrass begins to tiller) is also provided by dithiopyr (see under preemergence).

**DCPA (Dacthal):** Use 1/3 lb of 75% wettable powder (WP) or 4-1/2 lb of 5% gran per 1000 sq ft. A second application after 2 months at one-half the original rate is required to control late germinating crabgrass. Newly seeded turfgrass may be treated with DCPA after crabgrass has grown sufficiently to require 2 clippings.

**Quinclorac (Roynet):** Use 3 to 4 lb of 2% gran or 2.2 oz of 50WP per 1000 sq ft in early spring prior to crabgrass emergence. Lawns consisting of fescue are not sufficiently tolerant for Roynet treatment. Excellent results have been obtained on bluegrass and bermudagrass lawns. Tall fescue and perennial ryegrass are sufficiently tolerant to quinclorac at the low label rate (2.13 lb of 2% gran per 1000 sq ft). Roynet is not used on home lawns.

**Pendimethalin (Turf Weeds Control, PoMD):** Apply in spring before emergence of crabgrass using 2.7 lb of Turf Weeds Control 1.71 gran per 1000 sq ft. This rate is equivalent to 2 lb per acre of pendimethalin. Use spreader settings provided on product as a guide for calibration. Professional applicators may use a 60WEC formulation (PoM, Turf Weeds Control 60WP, 4.12 oz per 1000 sq ft).

**Prodiamine (Barricade):** The rate of Barricade 0.6% varies with the type of turfgrass and the annual grass being controlled. For crabgrass control, use 0.3-0.6 oz of 0.6% WG in bermudagrass, tall fescue, bluegrass, and fescue, perennial ryegrass, and some creeping turfgrasses (not putting greens).

## Watch out for interactions!

Table 5.4 - Tolerance of Established Turfgrasses to Weedy Annual Grass Herbicides<sup>1</sup>

Herbicide	Kentucky bluegrass	Bermudagrass	Tall fescue	Perennial ryegrass	Fine fescue	Zoysiagrass
<b>Preemergent</b>						
Benlate	T	T	T	T	S	T
Beetle	T	T	T	T	T	T
Beetle + oxadiazon	T	T	T	T	—	T
DCPA	T	T	T	T	T	T
Dithiopyr	T	T	T	T	—	T
Cryzalin	I	T	T	I	—	T
Oxadiazon	T	T	T	T	S-I	T
Pendimethalin	T	T	T	I	T	T
Prodiamine	T	T	T	I-T	I	T
Sidon	T	I	T	I	T	T
Benlate + cryzalin	S-I	T	T	I	S	T
Benlate + trifluralin	T	T	T	I-T	I	T
<b>Postemergent</b>						
Dithiopyr	T	T	T	T	—	T
DSMA, MSMA	I-T	T	I-T	T	I	I-T
Fenoxaprop	T	S-T	T	I-T	T	T

<sup>1</sup>Relative tolerance is represented by: T=tolerant, I=use with caution at lower rates, intermediate or marginally tolerant, may cause injury and thinning, S=not sufficiently tolerant and/or not registered for use.

## CAUTIONS for Chemical Control

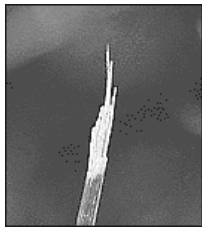
- Pesticide Safety
- Get the right one – use the PMG
- Look for interactions with desirable species
- Make certain it is labeled for use on the species present!
- Ornamentals and drift
- not used on new lawns – wait until after 3 mowings when lawn is “established”

## Best Management Practices

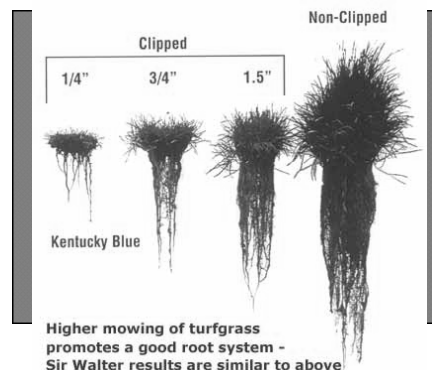
- Selection
- Mowing pg 354
- Thatch pg 360
- Fertilization pg 345 and 356-357
- Irrigation pg 359
- Overseeding pg 347-348

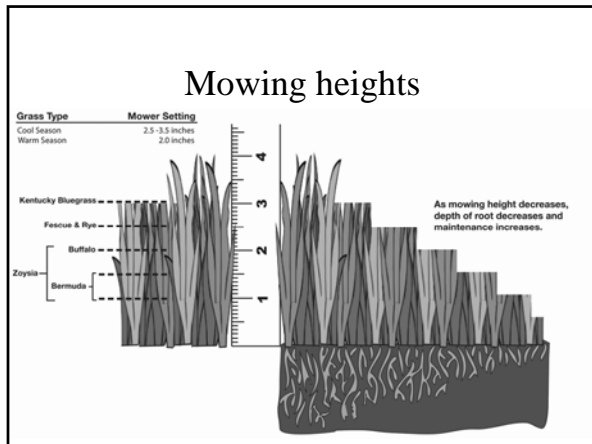
## How much to mow?

- No more than 1/3 of blade at any one time
- short clippings are more aesthetic and recycle quicker
- SHARP BLADE!!!



## 1955 research





### Thatch

- Accumulation of woodier parts of plants (crowns, stolons, etc.)
- A bit of thatch is good, acts like mulch
- Bluegrass and Zoysia = thatch problems
- Fescues don't have as much problem

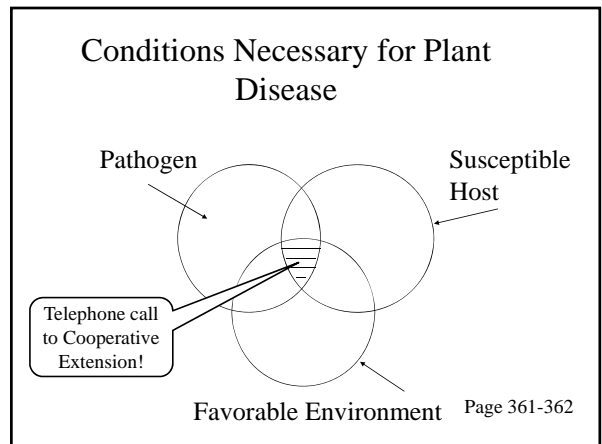
### Problem Thatch

- Above 1 inch is a problem
- Prevents water infiltration
- Roots come to surface (dehydration)
- Harbors pests
- Makes pesticides less efficacious



### Disease triangle

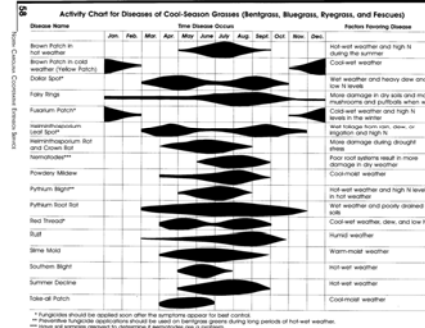
- Look in the book
- Page 361-362
- Susceptible host
- Pathogen
- Favorable environment



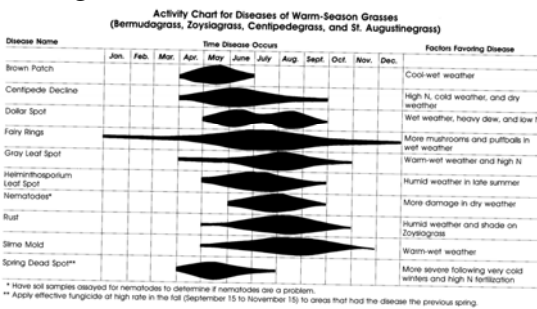
## Disease Treatment

- Know the disease
- preventative applications may not be the smartest
- don't know if the disease will start
- may not be the best thing to expose yourself to
- doing nothing can be a viable alternative

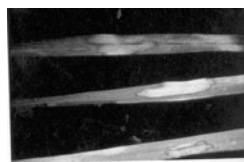
## Diagnoses – Use the Calendar!



## Diagnoses – Use the Calendar!



## Rhizoctonia for example



- Saprophytic v. parasitic
- Host and pathogen are always there
- >65° at night (June) in Cool-season grasses
- Or < 65° during the day for Warm-season grasses
- Warm (or cool), wet conditions (weather and watering practices)

## Disease Treatment

- Use the PMG – Get help
- preventative applications may not be the smartest
- don't know if the disease will start
- may not be the best thing to expose yourself to

Powdery Mildew (Erysiphe graminis)	Fescues	Reduce stress. Do not over fertilize.		
<b>Pythium Blight</b> (P. aphanidermatum and P. ultimum)	(The following fungicides are cleared for use on lawns for the control of Pythium diseases.)			
Bluegrass	Heritage 50WG	0.4 oz	10-14 days (Under heavy disease pressure, may not provide complete control)	
Ryegrasses	Heritage 50WG	0.4 oz	10-14 days (Under heavy disease pressure, may not provide complete control)	
Bermudagrass	Heritage 50WG	0.4 oz	10-14 days (Under heavy disease pressure, may not provide complete control)	
Fescues	Heritage 50WG	0.4 oz	10-14 days (Under heavy disease pressure, may not provide complete control)	
Zoysia	Insignia 20WG	0.5-0.9 oz	14 days (Under heavy disease pressure, may not provide complete control)	
	Segway <sup>1</sup>	0.45-0.9 oz	14-21 days	
	Subdue Maxx	0.5-2.0 oz	10-21 days	
<b>Rhizoctonia Blight</b> ("Brown patch") (Rhizoctonia solani)	(Under heavy disease pressure, fungicides may not provide complete control)			
Bluegrasses	Armada 50WP	0.6-1.2 oz	14-28 days	
Ryegrasses	Heritage 50WG	0.2-0.4 oz	14-28 days	
Fescues	Heritage 50WG	0.2-0.4 oz	14-28 days	
	Disarm	0.09-0.36 oz	14-28 days	
(Large patch)	Bermudagrass	Heritage 50WG	0.4 oz	
	St. Augustinegrass	Heritage 50WG	0.4 oz	
	Zoysia	Heritage 50WG	0.4 oz	
	Insignia 20WG	0.5-0.9 oz	21-28 days	
	Prostar 70WP	1.5-3.0 oz	14-21 days approximately 30 days prior to dormancy	

<sup>1</sup> Denotes either chemical, coined name of the material, or representative trade name. Many products may only be available in lawn and garden specialty stores and/or special orders.  
<sup>2</sup> Except where indicated, all materials should be applied in 1.0-2.0 gal water per 1000 sq ft. Lower rates are to be used in preventive programs; higher rates are to be used in corrective programs.  
 \*Application by homeowner is prohibited. Must be made by a certified applicator.

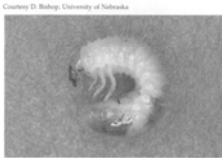
## Disease Treatment

- doing nothing can be a viable alternative
- Red thread – cool wet weather and poor fertility
- Powdery Mildew – low light, over fertilization
- Slime Mold – warm wet weather or winter

## Irrigation

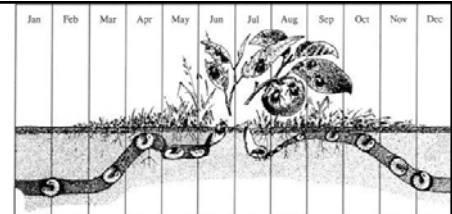
- 1 inch per week (slowly, at one time)
- but dependent on grass species, previous rain and temperature
- Water early
  - Less evaporation
- Don't water late
  - disease

## Insects



- White grubs,
  - Japanese beetles,
  - Green June bug,
  - European chafer
- Know their life cycle for best control

## Life cycle



- June adults feeding on plants, into July
- Late July mating time
- Females burrow into thatch layer, lay eggs
- Adults die
- Larvae start feeding on roots in July and August
- As temperatures decrease (September, October), they migrate into soil 8 – 10 inches
- April, May start their way back up, feeding on roots as they go

## Control - Chemical

- Best time is late summer, targeting young grubs which are close to surface and most vulnerable to insecticide
- Pre-water to draw grubs into cool, moist soil, apply insecticide
- All insecticides used are broad-spectrum, do kill worms and beneficial insects that are near or at the surface (but there are others deeper in soil)
- Beware of the endless cycle

## Control - Other

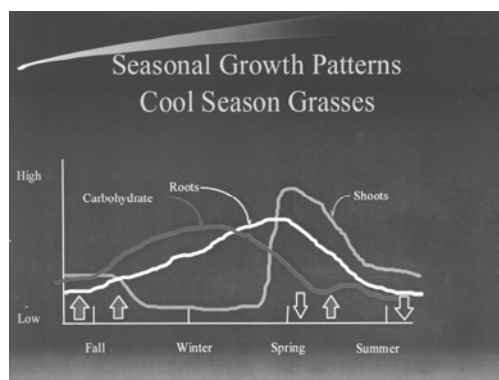
- Milky spore – specific to the Japanese beetle
- Bacteria – takes 2 – 3 years for 100% cover
- Predatory nematodes
- Patience

## Fertilization

- Essential to good stewardship
- Apply it when the plant can use it

## Look at the effects of Fertilization

- Prince William MG Teaching Garden Photo
- Good turf prevents erosion
- Good turf aids water infiltration
- Lowers ambient temperature in summer
- Raises it in winter
- Good turf needs less pesticide



## Fertilization Program

- Cool season program
- SON
- Get a soil test
- Calibrate spreader

## Enjoy March Madness

- Don't buy that weed 'n feed they advertise
- Unless you REALLY love to Mow don't fertilize in the Spring!
- Loobey doesn't have a good lawn and his kids can't play on it