Growing A Great Home Lawn

(Updated August 2018)

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Questions? Contact Me!

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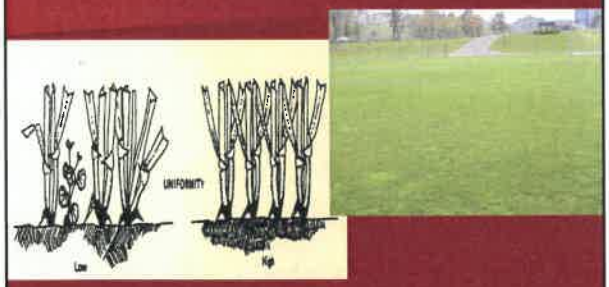
What are turfgrasses and where do we grow them?

What are your goals?

TURF QUALITY



Quality is a function of color & density

Site Evaluation

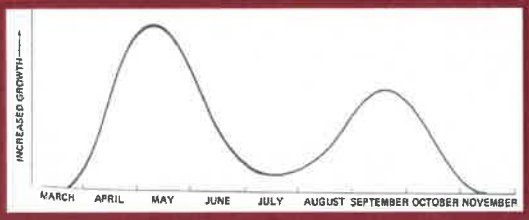
- Use of the area
- Sun or shade
- Soil type
- Irrigation
- Expected maintenance level
- Quality expectations

Just what size is your lawn?

What Lawn Grasses Do We Grow?

- All are cool season grasses
- Kentucky Bluegrass
- Perennial Ryegrass
- Fine Fescues
- Tall Fescues

Typical Kentucky Bluegrass growth cycle



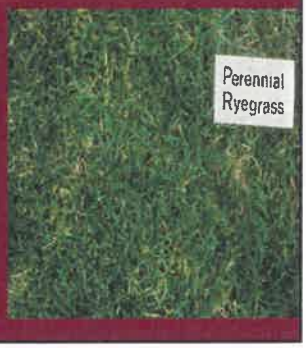
Optimum Root Growth	55-62 degrees F
Optimum Shoot Growth	60-75 degrees F

Kentucky Bluegrass

- Rhizomes - spreads and recuperates well
- Good color, medium to fine texture
- Very attractive
- Tolerates many conditions
- Likes good fertility
- Long germination time

Perennial Ryegrass

- Bunch type grass
- Medium texture and color
- Likes sunny conditions best
- Does not tolerate drought well
- Some have endophytes
- Rapid germination and establishment
- Good for quick fixes



Fine Fescues

- Include chewings fescue, creeping red fescue, hard fescue, sheep fescue
- Very fine texture, wear intolerant
- Takes poor soil, low fertility, sun or shade
- Slow growth, less clippings
- Low maint. lawns

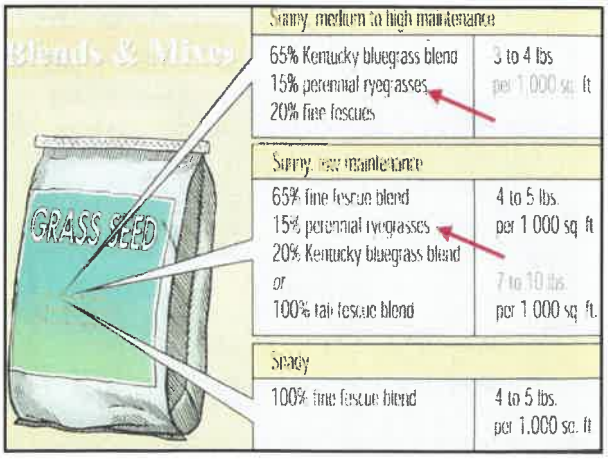
"Low Mow" Fescue

- Planted at our Demonstration Garden August 21, 2006
- Prairie Nursery, Westfield, Wisconsin (prairienursery.com)

- 24.50% 'SR5100' Chewing fescue
- 24.50% 'Azay' sheep fescue
- 12.25% 'SR3100' hard fescue
- 12.25% 'Scaldis' hard fescue
- 12.25% creeping red fescue
- 12.25% 'Dawson' red fescue

Tall Fescue

- Was/is a weed
- Coarser texture
- Tolerates drought, poor soil, and lower fertility
- Full sun to light shade
- Does not play well with other grasses
- Mod. germ. time
- Avoid "Kentucky 31"



August 15th through September 15th

Aids to germination

- Water, water, water
- Starter Fertilizer

Aids to germination

- Straw mulch
- Paper mulch
- Germination mat




Some problems like rust and chinch bugs can be avoided by buying resistant seed


- Surface-feeding insects such as chinch bug can be discouraged by using "endophyte-enhanced" grasses
- Many grasses have been bred for disease resistance

Trebro Sod Harvester at Saratoga Sod Farm, Rensselaer County, NY



Installation…

What can go wrong?

- Poor soil/site preparation
- Watering – too much or too little
- Wrong site for sod type
- Wrong site for turfgrass

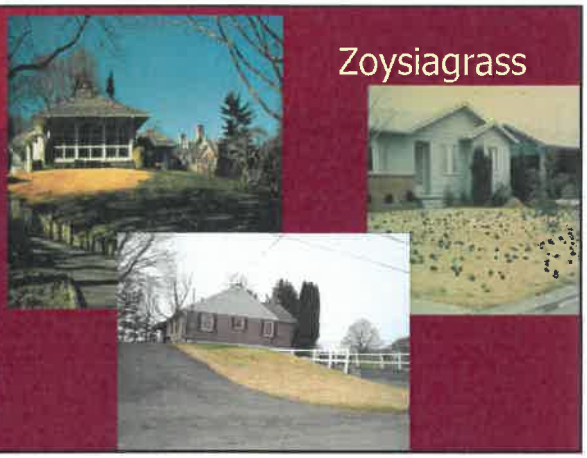
Think twice before planting:

- Annual ryegrass
- Zoysiagrass

Annual ryegrass

- What word in this plant's name provides a clue this would not be a good lawn grass?

Zoysiagrass



What about white clover?

- Once common in seed blends
- Important to honeybees/pollinators
- Potential for bee stings, grass stains and poor footing
- Drought tolerant. N fixing
- Used 2 lbs. seed per acre or 0.05 lbs. Per 1000 sq. ft.

Do we have to have lawns everywhere?

Maintaining a Lawn in the Capital District

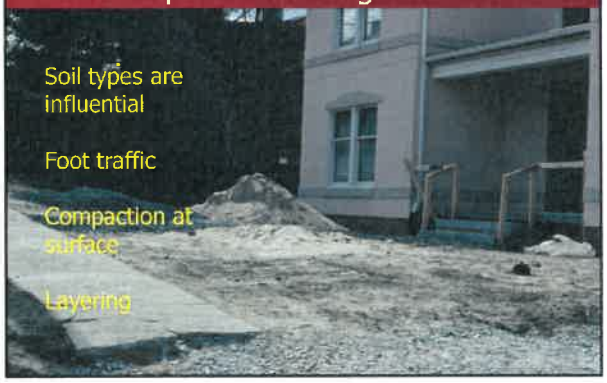
Poor soil, poor turfgrass

Trophy house, lousy lawn

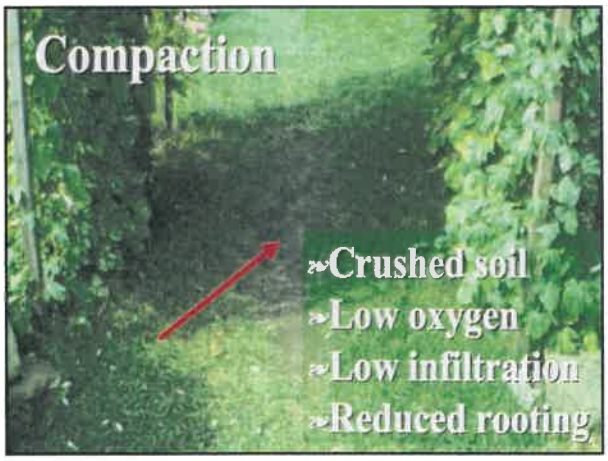
Soil challenges

- Sandy soil
- Heavy clay soil
- Stony soil
- Topsoil has been removed
- Slopes
- Compacted soil (good quality or poor quality)
- Dry conditions

Soil compaction during construction



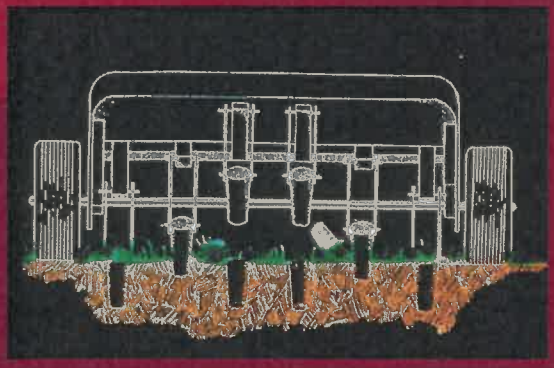
Compaction

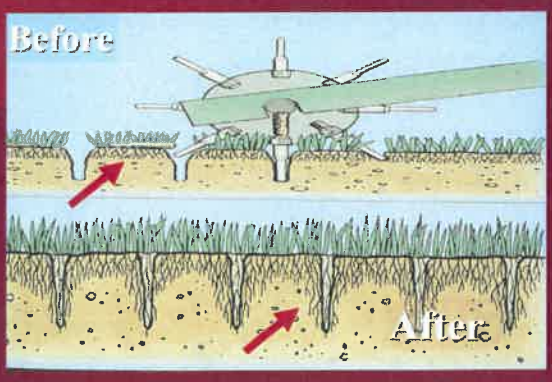


Do you have soil compaction?

Core Cultivation

- Professionally done
- Rental equipment
- "A practice more beneficial than even fertilizing"
- Soil compaction
- Thatch
- Overseeding
- Cores removed vs. spiking





Aerators

Aerators

Thatch

- Old crowns, leaf sheaths, rhizomes, etc.
- Kentucky bluegrass and fine fescues
- Highly maintained lawns
- Is all thatch bad?
- Grass clippings and thatch
- Is that thatch in the photo?

March 30, 2016

What is thatch?

- Organic matter
- Roots, stems, etc.
- Not clippings
- OK up to 1"
- Insulates and cushions

How do you alleviate thatch?

- Core cultivation
- De-thatching machines
- Liquid de-thatching products

Thatch removal

Equipment

Power Rake Blade

What is overseeding?

- Overseeding is a practice which adds seed to an existing lawn or turf area to improve the density of the stand of grass
- You may also use it to introduce a new grass type, or a pest-resistant grass

Which grass species will work best in overseeding?

PERENNIAL RYEGRASS!

New Idea: Heavy Repetitive Overseeding

- Put out perennial ryegrass with a drop spreader 3 or more times at 2 week intervals
- Use a rate of 2 to 4 lbs. of seed per 1,000 square feet
- Best starting right after Labor Day

3 rates of seed on heavily trafficked area

As the crabgrass dies out in the fall, the perennial ryegrass can move in

About 11 months later, density was over 90% in all plots

98% Crabgrass and weeds, August 14, 2017

Plots had 85%+ desirable grass by late October, 2017

Fixing Bare Spots In The Spring

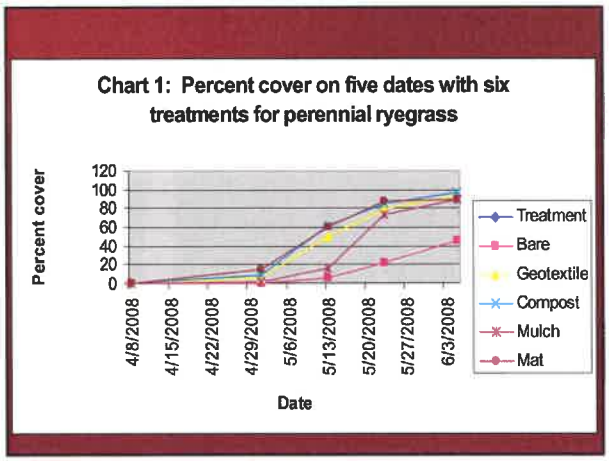
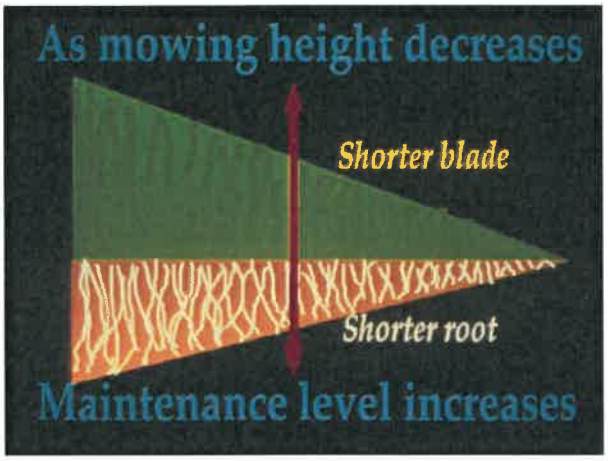
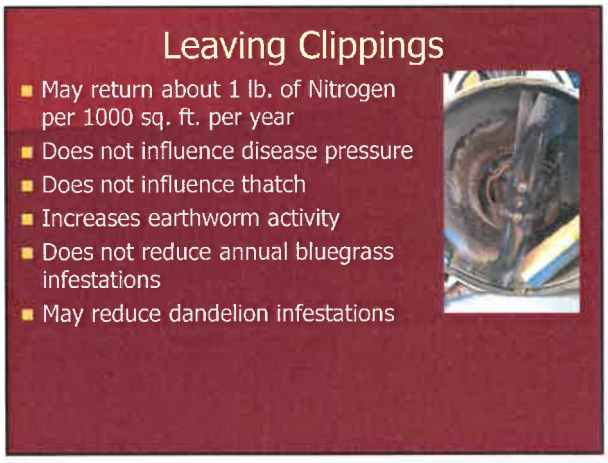


Chart 1: Percent cover on five dates with six treatments for perennial ryegrass
Percent cover
120
100
80
60
40
20
0
4/8/2008
4/15/2008
4/22/2008
4/29/2008
5/6/2008
5/13/2008
5/20/2008
5/27/2008
6/3/2008
Date
Treatment
Bare
Geotextile
Compost
Mulch
Mat


May 8, 2007
GEOTEXTILE
BARE
MULCH
MAT


MOWING


As mowing height decreases
Shorter blade
Shorter root
Maintenance level increases


Leaving Clippings
May return about 1 lb. of Nitrogen per 1000 sq. ft. per year
Does not influence disease pressure
Does not influence thatch
Increases earthworm activity
Does not reduce annual bluegrass infestations
May reduce dandelion infestations


Leaf mulching

Rotary mowers vs...

Reel mowers

What is going on here?

Mowing efficiency

- A sharp mower blade increases efficiency 20-30%
- A 3.5 HP mower used for one hour releases as many pollutants as a new car driven 340 miles
- A fairway type mower uses 4 gallons of fuel per hour and emits 80 lbs. of CO_2
- Small equipment can release 25% of the gasoline in the tank as unburned exhaust
- 800 MILLION gallons of gas is burned by lawnmowers in the USA annually!

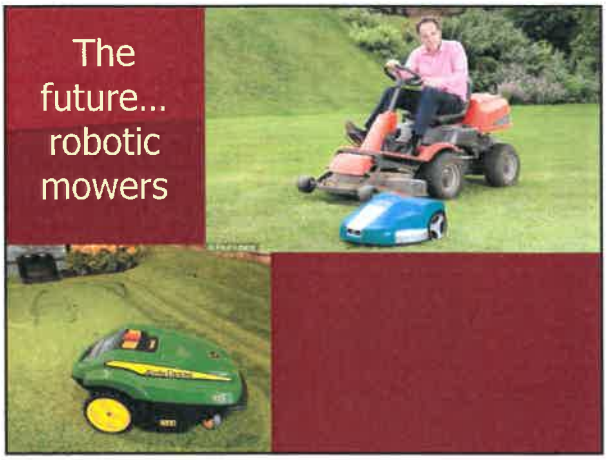
Mowing height matters

As mowing height increases, crabgrass decreases

Mowing Height (Inches)	% Crabgrass in September
1	96
2	63
3	22
4	4

Tall fescue turfgrass, with large crabgrass seeded into it. Doyle, Michigan State University, 2008

The future… robotic mowers



Lime

Do you need to add lime?

Lawns like a pH of 6.5 to 7.2

You must do a soil test!

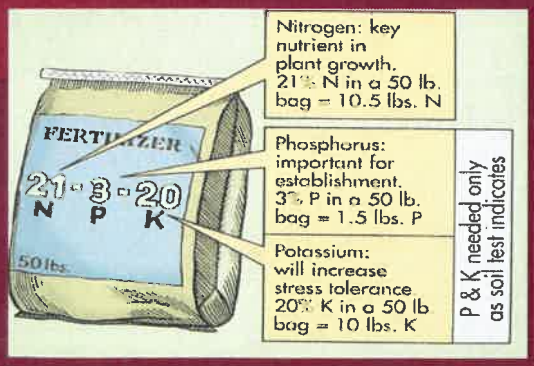
Testing Soil pH

- Buy a test kit and test it yourself
- Take a sample to a local garden center or Cornell Cooperative Extension

Feed it right!

- Soil test
- Know size of area
- Proper setting
- Impervious surfaces
- Spreader type

All spreaders need to be calibrated, especially when they come new out of the box!



New NYS Law!

- As of January 1, 2012:
- No P application on a lawn unless you are establishing a new lawn or a soil test indicates the need for P
- Prohibits the application of lawn fertilizer on impervious surfaces and requires clean-up of spills
- Prohibits the application of lawn fertilizer within 20 feet of any surface water (with some exceptions)

- Prohibits the application of lawn fertilizer between December 1 and April 1
- See our website for a summary of the law:
- http://www.ccerensselaer.org/Home.aspx

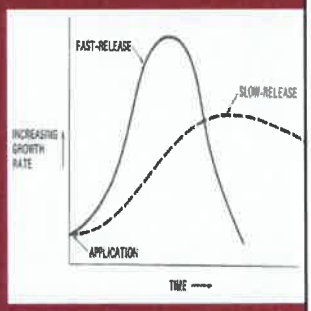
Testing Soil for Nutrients

- University of Massachusetts
- pH, P, K
- Mg, Ca, Al, Fe, Mn, Zn
- Organic matter
- Provides a fertility recommendation for up to three "crops"
- Lead level

See examples of UMass soil test reports

Nitrogen Fertilizers

- Quick release
- Slow release, organic or synthetic
- Without a soil test, we generally base what we do in turf on supplying nitrogen
- General rule: no more than 1 lb. of N per 1,000 square feet per application



Slow vs. Quick Release Fertilizers

- More constant supply of nutrients
- Lower burn potential
- Slower response
- Low leaching potential
- More expensive

- Quickly supply nutrients
- Higher burn potential
- Faster response
- Higher leaching potential
- Less expensive

Fast release N fertilizers

Source	Ratio	Comments
Ammonium nitrate	33-0-0	Fast release
Ammonium sulfate	21-0-0	Strongly acidifying, 24% S
Urea	45-0-0	High burn potential

Types of Slow Release Nitrogen

Nitrogen Name	Fertilizer Grade	Comments
Ureaformaldehyde (UF)	38-0-0	67% slow release by microorganisms, 33% quick release by water Availability may be limited during times of cool soil temperatures
Sulfur-coated urea (SCU)	32-0-0	About 30% quickly available. Releases over 10 to 15 weeks. Coated with varying thicknesses of wax and sulfur
Isobutylidenediurea (IBDU)	31-0-0	About 30 % quickly available. Release time depends upon particle size, not soil temperature. Blends release over 3 to 4 months
Polymer-coated urea	39 to 44-0-0	Coating absorbs moisture, which dissolves urea and diffuses into soil. Uniform release rate

Organic Fertilizers
(all slow release)

Name brand	Ratio	Comments
Milorganite	6-2-0	Activated sewage sludge
Ringer	6-1-3	Bone, blood and seed meal
Sustane	5-2-4	Composted turkey waste
Jonathan Greene	8-3-1	Feather, bone, blood, kelp meal, wheat shorts, amino and humic acids

Cornell's Home Lawn Program

Maintenance Level	May	Jun	Jul	Aug	Sept	Fall	Total
Low					1		1-2
Medium	1				1		2
High	1				1	1	3

Lbs. of N /1000 sq. ft. /month

Watering

- What type of irrigation do you have?
- How much rainfall does your yard receive each week?
- How much water is needed per week?
- When is the best time to water?

Watering

- Two tests:
  - Check the soil infiltration rate. How long does it take the soil to absorb 1" of water?
  - Check the irrigation rate. How long does it take for the sprinkler to put out 1" of water?

Lawn Diseases

When in doubt, call or bring a turf sample to CCE.

Capital District Turfgrass Diagnostic Lab

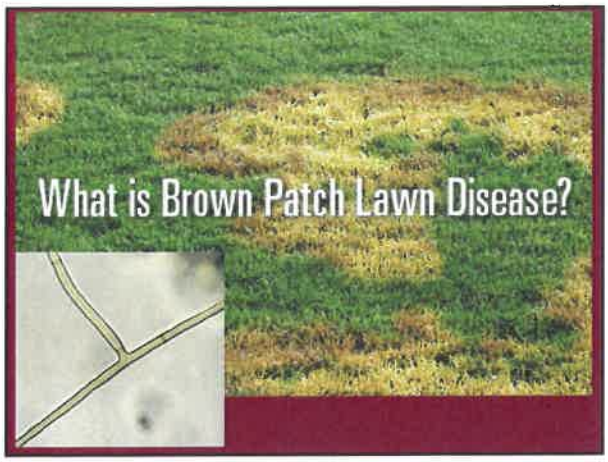
- How do you know what is wrong with your turf just by looking at it??
- Call Cornell Cooperative Extension of Rensselaer County at (518) 272-4210

Lawn Diseases

- Some you can see, some you can not
- Cool weather diseases
- Warm weather diseases
- Wet weather diseases
- Dry weather diseases

Grey Snow Mold

Tall fescue, lots of water, August 2018



Lawn Weeds

- Grassy or Broadleaf?
- Annual, Biennial, or Perennial?

Lawn Weed Removal

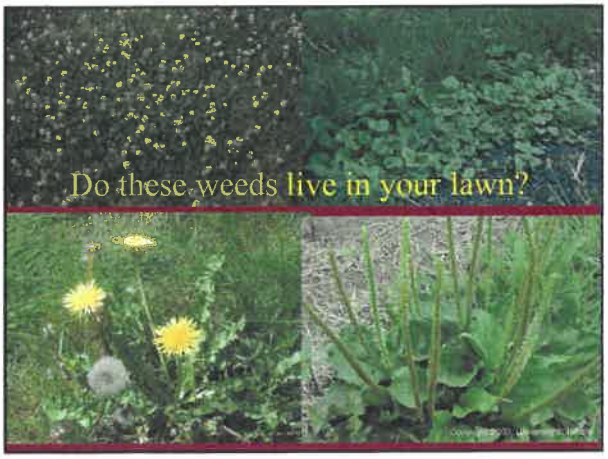
Must-have weed removal tools

Herbicide

A fun and dangerous tool

Want to get rid of your weeds?

- How many weeds can you tolerate?
- Weed ID is critical
- Some weeds (such as annual bluegrass, quackgrass, orchardgrass) are almost impossible for homeowners to manage
- Herbicides are the easiest (and almost the only) option



How can we manage broadleaved weeds?

- 2,4-D herbicide will kill many broadleaved weeds but leaves the grass alone
- 2,4-D is used in spring or fall
- 2, 4-D is sometimes mixed with mecoprop or other herbicides (including triclopyr or diclorprop) and is readily available to homeowners
- Timing is key for good weed death!

Ground ivy

Ground ivy

- Rounded leaves with teeth on edges
- Tubular light purple flower in spring
- Aggressive spreader via stolons
- Spread into landscape beds
- Distinctive odor

What about ground ivy and other perennial weeds that laugh at 2,4-D?

- These include wild violet and white clover
- Must use Triclopyr + 2-4D or Diclorprop + 2,4-D
- Weeds must be actively growing
- Repeat applications may be needed
- Late summer/fall or spring application
- New research indicates that 2,4-D alone can work well in OCTOBER!

Iron Herbicides

- Introduced in 2011
- Spot treatment application
- Contains iron, which is absorbed and oxidizes the plant
- Selectively kills weeds, causes grasses to turn darker green
- Liquid formulation
- Said to manage dandelion, English daisy, white clover, black medic, bull thistle, Canada thistle, common chickweed, creeping buttercup, Persian speedwell, slender speedwell, broadleaf plantain, narrow-leaved plantain, mosses, algae
- "Ortho Elementals Lawn Weed Killer" and "Fiesta"
- Will likely need 2 to 3 applications 3 to 4 weeks apart

Photos from the Canadian website "Daily Home Renovation Tips"

Immediately after application

Five days after application

FIESTA™

Turf Bio-Herbicide

Before FIESTA

After FIESTA (2 apps, 41 days)

ENGAGE AGRO

Our Study- Easiest to control

- Henbit, ajuga, white clover, oxalis and motherwort were controlled with one application in June

- Ground ivy was largely controlled by one June application, and completely controlled by two applications about 3 weeks apart
- Two apps were needed for ground ivy in late summer/early fall

Broadleaf plantain

- Two June apps gave about 90% control in a sunny area; 3 apps needed for 100% control
- Two late summer/fall apps seemed to be slightly more effective

Sprayed on June 8 and June 21

What is this and why do we grow it?

When the forsythia blooms, it is time to apply your pre-emergent crabgrass product.

Can we use a pre-emergent herbicide on a newly seeded patch or entire lawn???

- No!
- And yes!

- Siduron or Tupersan was historically the only safe herbicide
- Now there is mesotrione (Tenacity) – sold with starter fertilizer, or separately

Corn gluten

- Was an accidental discovery
- Research-based
- Nitrogen and herbicide effects
- Non-toxic to animals
- Does not effect established turf (other than the fert.)

- Slow release N source
- High rates are required
- Not water soluble
- Exempt from EPA registration
- Working on a sprayable form

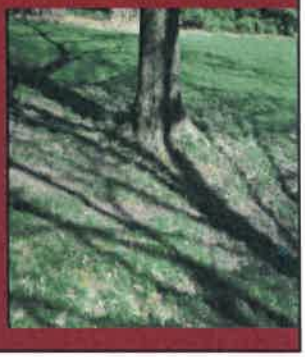
Can we control crabgrass *after* it germinates?

- Yes, but this is difficult for homeowners, since the herbicides used are not as readily available as the pre-emergent herbicides

- Look for products which contain fenoxaprop (Acclaim) or methanearsonates (MSMA)

A moment on moss

- Primarily in lawns that are in poor condition
- Moss is not a good competitor
- Check fertility, pH
- Increase sunlight?
- De-mossing products
- Moss gardening



A Few Lawn Insects

Colletes inaequalis – Polyester bee

Castleton Cemetery, late March 2016

"What is killing my lawn?"

Chinch Bug

- Adult 3/16 inch long
- Start red, then gray, then black with white wings
- Piercing-sucking mouthparts
- Prefer hot dry weather
- "True bug"
- Incomplete metamorphosis

Chinch Bug Cycle

- Two generations per year
- Adults overwinter in leaf litter and thatch
- Female lays up to 300 eggs in 40-50 days

Chinch Bug Damage

- Cool weather promotes the fungus disease Beauveria
- Second generation = more damage
- Feed on all types of grasses
- Monitor in July and August
- Yellowing then browning patches

Chinch bug detection device

Chinch Bug Treatment

- Management primarily using insecticides
- Some cultivars differ
- 'Baron' and 'Newport' Kentucky Bluegrass and 'Pennfine' and 'Manhattan' perennial ryegrass show some resistance
- Endophytes

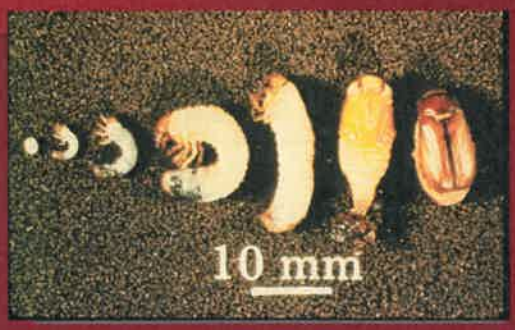
Hairy chinch bug adults, normal and short winged forms

Chemical insecticides for chinch bug management (homeowners)

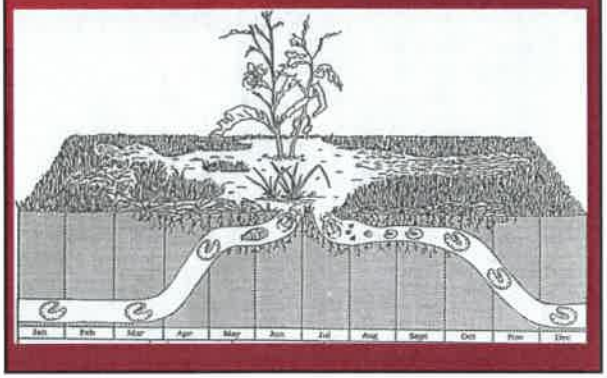
- Carbaryl, bifenthrin, cyfluthrin, imidacloprid
- Read label before applying, but probably will have to:
- Water lawn before and maybe after applying
- May need a follow-up treatment in 2 to 3 weeks

Turfgrass is dead from feeding of grubs

Lawn Damaging Pests



Grub Lifecycle



Japanese Beetle

- Feeds within 2 inches of surface
- Often feeds within thatch
- Record count = 122 grubs per sq. ft.


Japanese beetle adult

European Chafer


European chafer adult

- Feeds within 1-2 inches of surface
- Mobile pests
- Feed later in fall and earlier in spring
- Often hard to kill with chemical pesticides
- Larger than Japanese

European chafer

Biological grub indicators

Scouting scenes at Pelham Country Club

Looking for eggs or first instars

Insecticides for White Grub Control

- Chlorantraniliprole – branded "Grubex," "Acelepryn," others
- Imidacloprid – can be branded "Grubex" as well!
- Trichlorfon – "Fast-acting"
- Carbaryl
- Azadiractin
- Acephate
- Chlorpyrifos
- Bifenthrin
- Cyfluthrin

Biologicals for White Grub Management

- Milky spore disease (*Bacillus popilliae*)
- *Bacillus thuringiensis*
  - Variety *Japanensis*
  - Strain *buibui*
- Entomogenous nematodes
  - *Steinernema carpocapsae*
  - *Steinernema glaseri*
  - *Heterorhabditis bacteriophora*

More on nematodes

- Sensitive to UV light, temp., pesticide residue
- Apply at 1.5 to 2.0 billion per acre
- Have traditionally been quite costly but have come down to about $300/acre (2012)

Concerns about Milky Spore

- Cornell launched a field and lab study in 2003 to determine efficacy of milky spore
- CCE Rensselaer Co. was a participant
- No treatment of milky spore in the lab was effective
- Field study abandoned in late 2004
- More follow-up is needed

Mechanical management for grub control

- Whitney Cranshaw, University of Colorado, claimed in 1989 that 3" spiked sandals controlled 56% of the grubs in test plots
- No mention of how much aerifying was actually done

Mechanical management for grub control

- Dr. Ben McGraw of SUNY-Delhi has demonstrated that up to 81% of the grubs can be killed by aerifying
- 2 times, same day, 1 inch tines, hollow or solid tines, spaced 1.5 inches apart