LAWNS IN AMERICA

SHADES OF GREEN

OR

MY LAWN IS GREENER THAN YOURS

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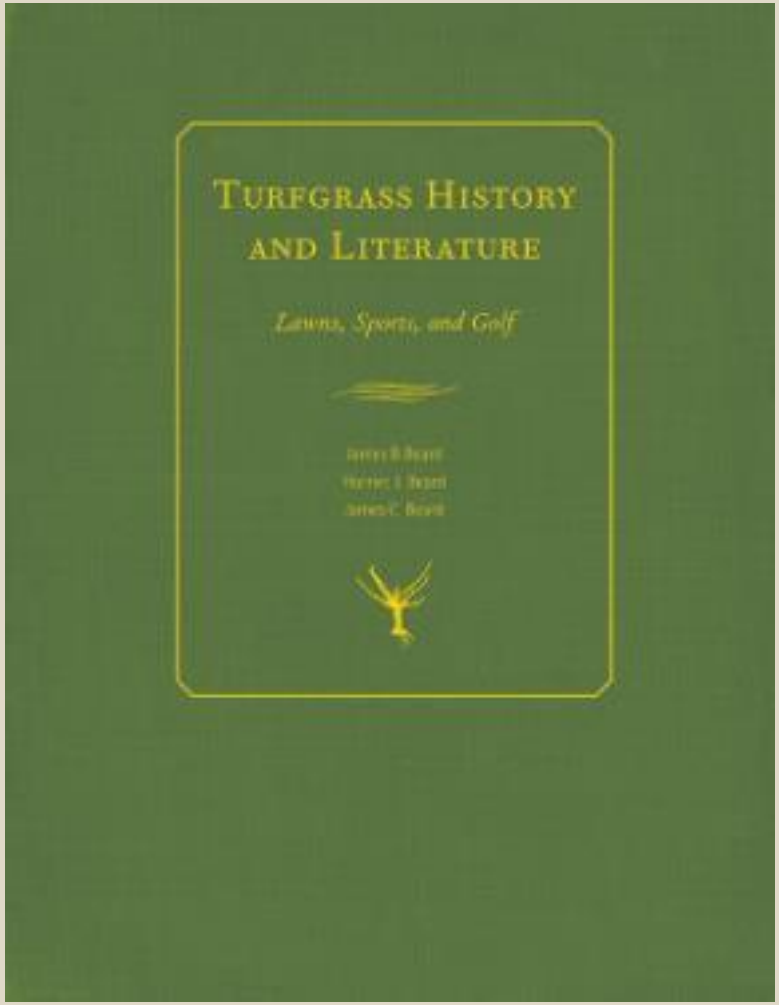
Dr. James B. Beard
"*Turfgrass History and Literature*
Lawns, Sports, and Golf"



www.thelawninstitute.org

“*Professional turfgrass culture is one of the few areas of applied plant science where:*

The ultimate goal is perfection,

Which is seldom achieved,

When reached, it is fleeting,

Therein lies the ultimate challenge.

Further

Upon approaching perfection in turfgrass,

The more evident the imperfections become,

The more difficult and costly they are to correct,

There lies the intrigue.”

DR. JAMES B. BEARD

Agenda

- Fun Facts about lawns and turfgrasses
- Today's turfgrass industry
- The evolution of lawns in Europe and America
- The invention of the mower and other equipment.
- How the sports industry has driven lawn advances for homeowners.
- Guidance for homeowners – "Love a Good Lawn"
  - Cornell recommends *"Lawn Care: The Easiest Steps to an Attractive Environmental Asset"*

Fun Facts

- Turf is the most Irrigated Crop in the U.S.
- It requires 1” of water per week during the growing season.
- A 10’ x 10’ square of lawn requires 62 gals. per week.
- 30% of the water used on the East Coast is for watering crops.
- A single golf course in Tampa, Florida uses 178,800 gallons of water every day: the daily water consumption of over 2,200 people.
- Grass plants are 75 to 80% water, by weight.
- Up to 90% of the weight of a grass plant is in its roots.
- In a well maintained, thick lawn there are 6 turf plants per sq. inch.
- Turf converts 5% of CO^2 back into $O^{2.}$ A 250 sq. ft. lawn produces enough oxygen for a family of four.
- Grass traps more than 12 million tons of dust and dirt annually

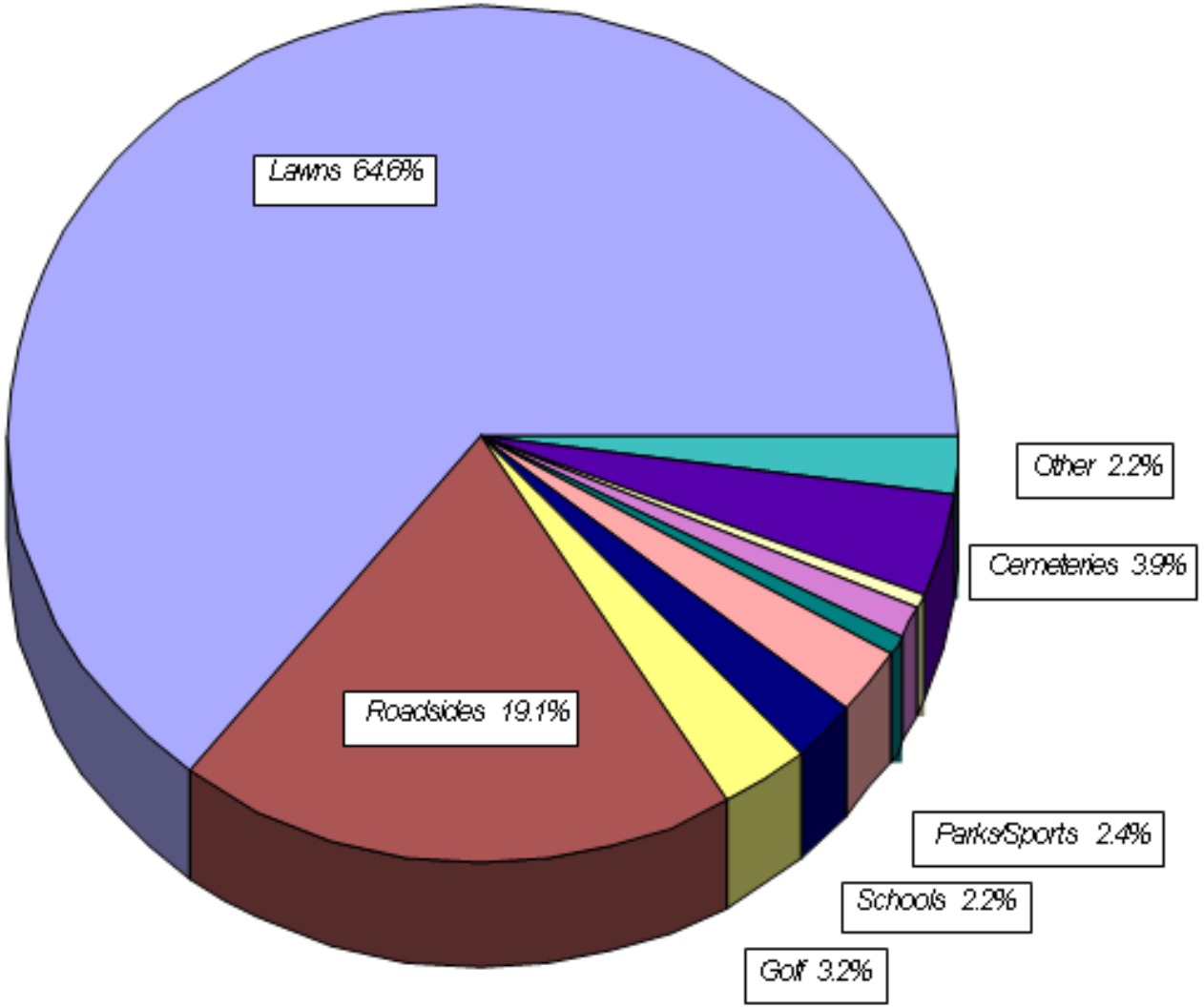
More Fun Facts

- The national average lawn size is about one-fifth of an acre.
- The average homeowner will spend 150 hours a year maintaining their lawn.
- $29.1 billion is spent on lawns or $90.23 per person each year
- The landscape services industry has annual revenues of $78 billion. 90 million pounds of fertilizer and 78 million pounds of pesticides are used annually.
- 10 times more herbicides per acre are spread on lawns than on the fields of agribusiness.
- Phosphorus run-off from lawn fertilizer causes algae blooms that suck oxygen out of lakes, and harm fish.
- A gas-powered mower emits as much pollution per hour as 11 cars.
- *With 85 million home lawns and over 16,000 golf courses, you have close to 50 million acres of cultivated turf in America.*

Definitions

- A **lawn** is residential, commercial or industrial land on which **grass** grows.
- **Turf** is the term used by horticulturists referring to **grass** that is mowed and maintained.
- **Turfgrasses** were developed to enhance the quality of life of humans and animals.
- **Pasture** is land covered with grass and plants suitable for grazing animals.
- A **Sporting Pitch** is turf managed for a specific sport uses. Golf, soccer, baseball, football, tennis and horse racing have unique requirements.
- **Parks, highways** and **cemeteries** also contain vast amounts of managed turf.

The U.S. Turfgrass Industry



National Turfgrass Federation, Sept. 2006

Who's Who in Green?

The Turfgrass industry represents 474,237 businesses and employs 969,257 people including ….

- Athletic field managers
- Lawn care operators
- Golf course superintendents
- Architects
- Developers
- Homeowners
- Landscape designers
- Contractors
- Seed and Sod producers
- Parks and grounds superintendents
- Roadside and vegetation managers
- Cemetery managers.

All are focused on growing grass.

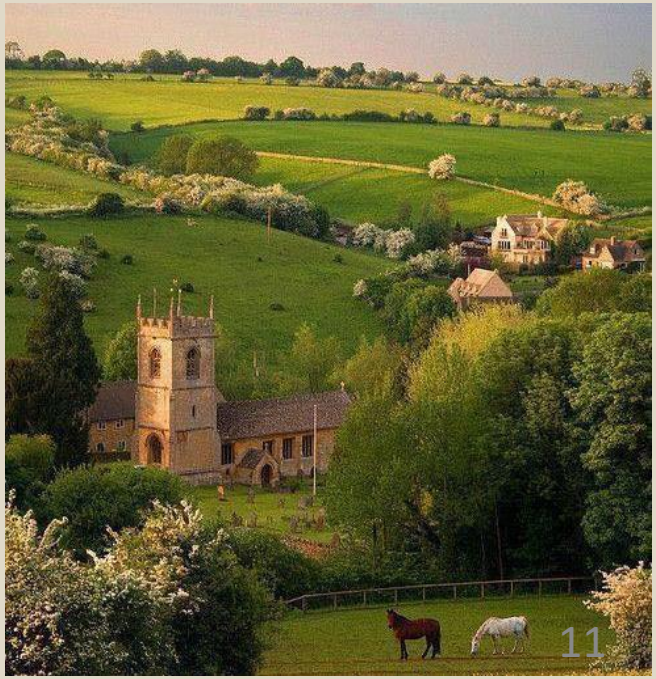
Turfgrass Associations

- National Turfgrass Evaluation Program (NTEP)
- United States Golf Association (USGA)
- Golf Course Supt Association of America (GCSAA)
- Professional Lawn Care Association of America (PLCAA)
- Turfgrass Producers International (TPI)
- Oregon Seed Council (OSC)
- Sports Turf Managers Association (STMA)
- The Irrigation Association (IA)
- American Society of Landscape Architects (ASLA)
- The Lawn Institute
- The U.S. Tennis Association
- The Outdoor Power Equipment Institute
- University Programs (teaching and research): Penn State, NCSU, OSU, MSU, UMASS, GA, Purdue, Texas A & M, Maryland, Nebraska
- Magazine and Publications

All are focused on growing grass.

Turfgrass History - Safety

- Low turf grasses of expansive savannas in African and prairies in North America allowed humans to better spot danger or stalk prey.
- In medieval England and Europe (5th to 15th century), tree-free grass-filled spaces around castles made it easier to for watchman to scan the horizon for friend, foe or game. (Forests hid bandits and monsters!)
- 12th century literature refers to Turfgrass lawns managed by animals grazing or hand scythes.



St. Andrews church, Gloucestershire

Turfgrass History - Wealth

- 15th century paintings depict private ornamental lawns and lawns in public parks.

By Frédéric Scalberge (1542-1640)
https://commons.wikimedia.org/w/index.php?curid=35485

- 16th century estates had elaborate formal gardens
  - Lawns were maintained by servants by hand
  - Only the wealthy could afford lawns.
  - It was a symbol of success.

St. Mary's* chapel, S*udeley castle

Village Gardens and Lawns Evolved

- Medieval European villagers
  - Space around homes used to grow vegetables, fruits and herbs for culinary and medicinal purposes.
  - Central grassy spaces or “commons” were used as the grazing area for their sheep and cows.
- Early immigrants to North American
  - Copied European design.
  - Brought seeds for grains, carrots, onions, and livestock.
  - Imported seeds for pasture grasses (and weeds) when native prairie grasses over-grazed.
- As villages in North America formed, home gardens were a few flowers in front, with an enclosed yard in the back for food.

Public Gardens in Paris introduced ….

- In 1680, at Versailles André Le Nôtre created the *Tapis Vert.*
- In the 1800s artists started to celebrate outdoor spaces as places of leisure, inspiration and relaxation
- 1854-1870 Emperor Napoleon III's reconstruction of Paris included tree-lined boulevards and parks and introduced public green spaces to be enjoyed as open-air salons.

Rural residents were prompted to cultivate their own flower gardens.

President Washington's Mount Vernon Bowling Green

Originally designed with geometric kitchen gardens, in 1785 more naturalistic landscaping was implemented based on English architect and landscape designer Batty Langley's book, *New Principles* of Gardening, published in 1728.

The Bowling Green, once a week, was poled to scatter worm casts then mowed with scythes and occasionally rolled with stone rollers to smooth the surface.

President Jefferson’s West Lawn

Thomas Jefferson, heavily influenced by naturalistic gardening techniques in the 1780’s, was an avid collector, gardener and advocate of growing vegetables to homeowners. He is viewed as the American father of landscape architecture at University of Virginia.

Monticello's West Lawn, which features the "Nickel View" of the house, is an icon of American landscapes. It was smoothed and leveled as a favorite playground for children, but only scythed a few times a year.

The White House

- Planned by President George Washington (1789-1897).
- First occupied by John Adams (1797-1801)
- Modified by Thomas Jefferson (1801-1809).

The original mowing technique.

Mowing Inventions

1830 - First mechanical lawn mower invented by Edwin Budding in Gloucestershire, England.

- Designed primarily to cut the grass on sports grounds and extensive gardens.
- Formed as a series of blades arranged around a cylinder with a push handle.
- Patterned after a machine used in a cloth factory for shearing the nap on velvet.

1850's – more inventions including horse and pony drawn mowers.

1870 - Elwood McGuire of Richmond, Indiana designed a lightweight mower to be pushed by people

By 1885, America was building 50,000 lawnmowers a year and shipping them to every country on the globe.

1902 – First commercially available mowers with internal combustion gasoline engines.

1950's - rotary mowers, effective pesticides, combination fertilizer and weed-control products, watering improvements, and rotary spreaders for more efficient application caused a lawn boom by homeowners.

http://www.american- lawns.com/history/history_lawn.html

Mowers Through History

Coldwell Mowers From Newburgh, NY

Advertises
Hand, Horse
and Mower

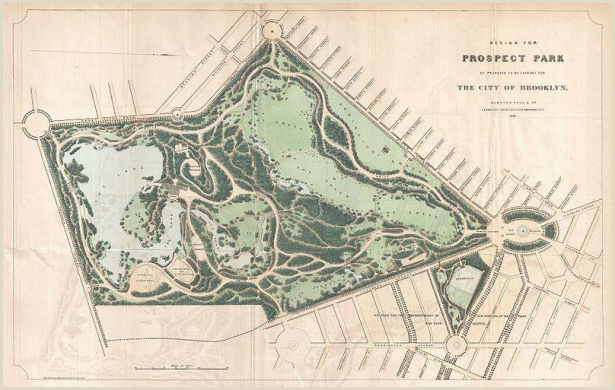
Riding Reel Mower
circa 1935

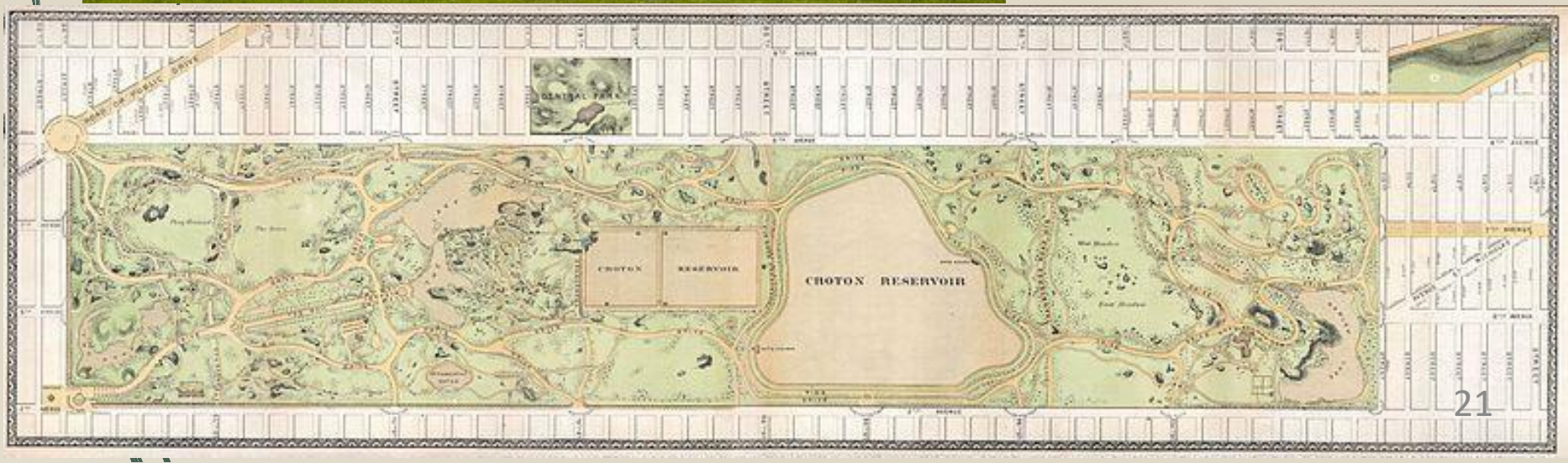
Walk Type
Gas Power
Reel Mower

Frederick Law Olmsted

Central Park 1858

Brooklyn Prospect Park 1867





Frederick Law Olmsted

Chicago Riverside suburb – 1868
Designed with Front Lawns and 0pen shared space

Levittown 1947 – 1952

Abraham Levit & Son's suburban community included established lawns as part of the home sale package.

http://statemuseumpa.org/levittown/one/d.html

1951 Indian Cycle Mower

1950's Toro Golf Course Mower

Sports Industry Drove Turfgrass Industry

- Late 12th and early 13th century sports use included “bowling greens” the forerunner of tennis courts, croquet courts and golf putting greens.
- From the 12th century forward, sodding (also called turfing in the early days) was the form of turfgrass establishment. Sod was typically harvested by hand from older, established, livestock-grazed lawn sites.
- Late 16th century, cricket and soccer were the first team sports played on turfgrass in England, also golf in Scotland
- The early 19th century, a horse pulled “sled-like device” was introduced for controlling width and depth while harvesting sod.
- 1950’s - The growing golf and team sport markets, and the increasing popularity of sodding, prompted research by turfgrass breeders in both cool-season and warm-season turfgrass.
- 1960’s – Artificial turf installed in the Houston Astrodome
- Special considerations for sports turf include type of grass, density of turf, length of blades and equipment.

From the late 1800's baseball grew in America.
Stadiums had extensive staff to maintain the turf, and still do.

Sports Turf Componants

Sports Turf Management

Management Services examples

- Granular & Chemical Applications
- Aerification
- Deep Tine Aerification
- Fraze Mowing
- Top Dressing
- Verticutting
- Insect & Pest Control
- Over Seeding
- Synthetic Sterilization
- Soil Testing
- Mowing
- Fertility & Weed Management Programs
- Irrigation

Guidance for Home Owners

Love A Good Lawn

With more than 2.8 million acres of home lawns in New York State, what we do with our lawns matters. By cultivating a dense vigorous lawn you create an attractive environmental asset that will:

Provide a safe and fun place for outdoor play for people and pets of all ages

Catch, filter and conserve surface water to reduces run off of contaminants

Reduce soil erosion

Cool surface temperature

Capture and store carbon

Filter air pollutants

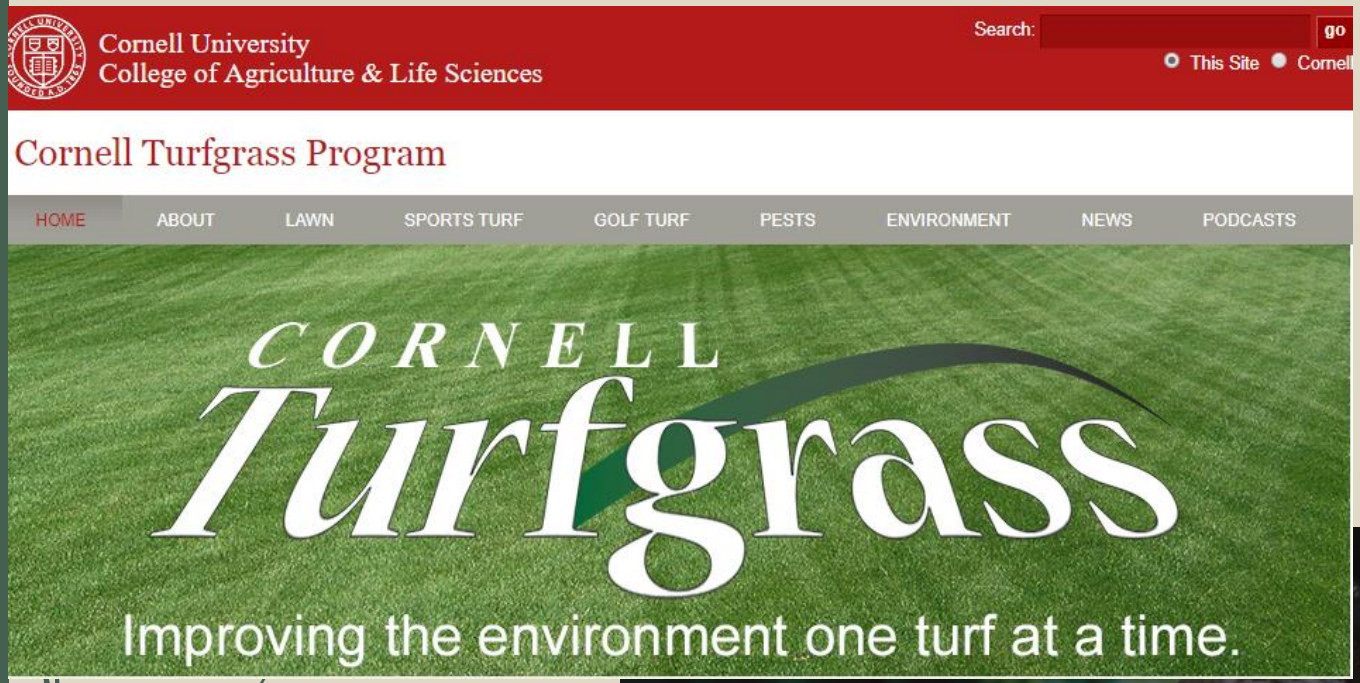
Reduce noise pollution

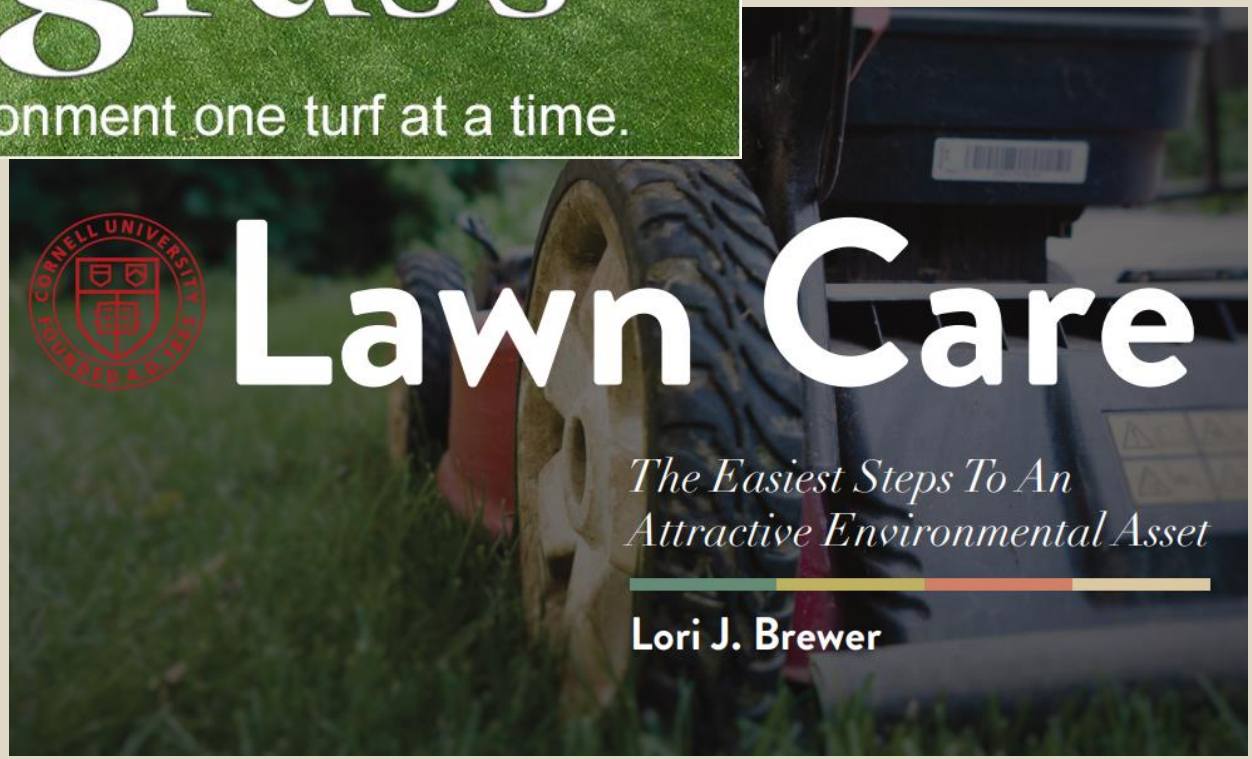
Find more details in The Benefits of Turf.

Home Lawn Myths

- Lawns should be de-thatched
- Clippings lead to thatch
- Weed and feed products are great
- Early spring fertilization is great
- Spring renovation is great
- Pre-emergent herbicide can be used after the weeds are up
- Mow low in the spring and fall but leave lawns high in the summer
- Lime is needed every year
- Treat for grubs every year
- Spring is a good time to treat for grubs

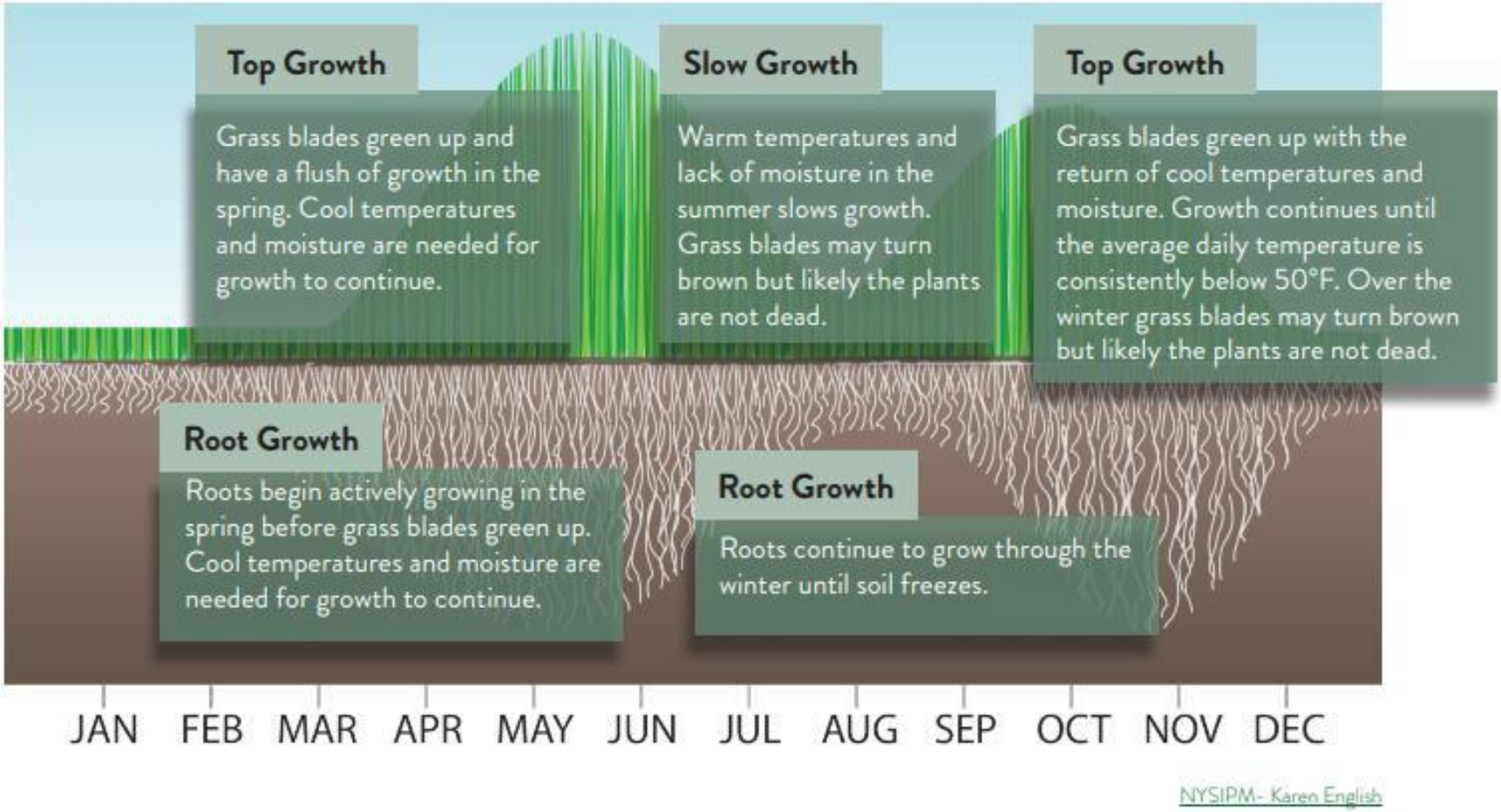
Turf.CALS.Cornell.edu/Lawn





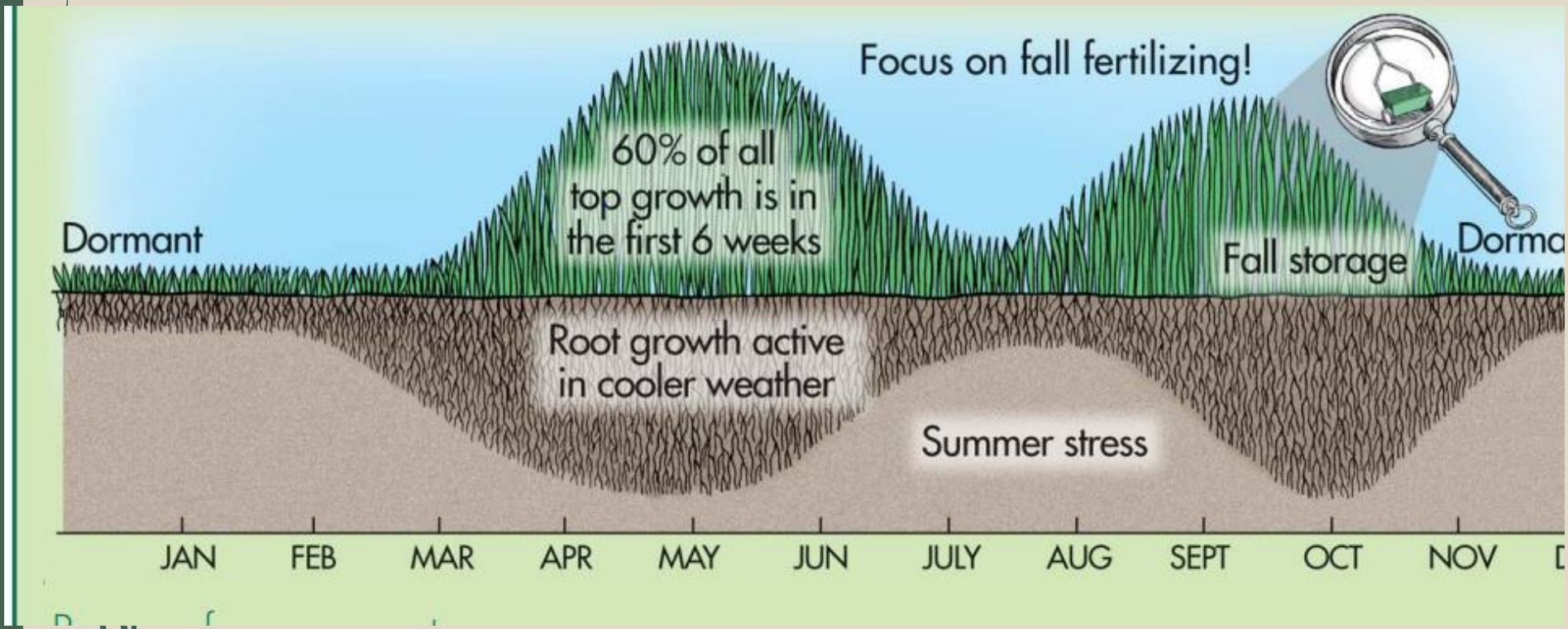
Step One | Know Your Lawn

In New York and areas with similar growing conditions, most lawns contain a mixture of cool-season grasses and weeds. Tap on the buttons below to find out more.



NYSIPM- Karen English

Know your lawn's seasonal growth



Step Two | Make Adjustments

Keep the Mower Blade Sharp.

Dull mower blades increase fuel use by up to 20% and shred the tips of grass blades. At the start of the season, consider taking your mower in for a tune up and blade sharpening. Throughout the season, check the appearance of your grass and mower blades. Look to achieve a clean cut on grass blades by sharpening mower blades at least once a season or when you see ragged brown grass blade tips.

Click above image for video content

Mow Grass Higher.

Lawns cut lower than 3 to 3.5 inches will require more fertilizer and water.

Mulch Grass Clippings.

Grass blades are mostly water and nutrients. Leaving cut blades in place lowers fertilizer needs. A mulching mower is designed to finely chop grass blades and tree leaves so they may slip between growing grass to soil surface.

Mow Tree Leaves in Fall.

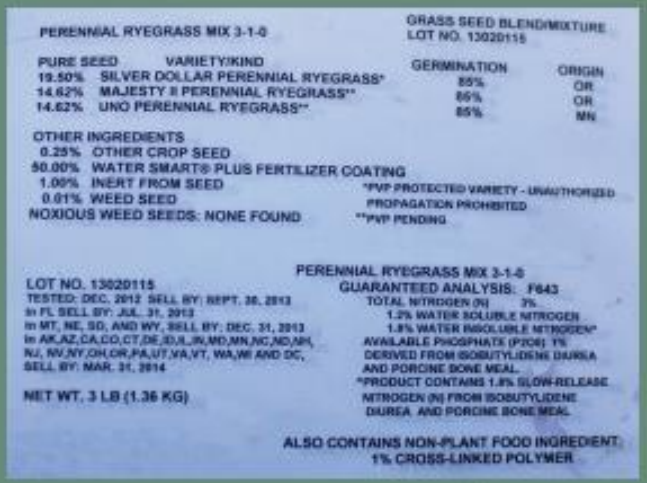
Lawn health is not compromised when tree leaves that drop on the lawn in the fall are chopped finely enough to slip between grass blades to soil surface. Chop dry leaves with a sharp mower blade when some grass is still peeking through throughout the fall.

Patch Weak/Bare Spots

If there is an empty space in your lawn, weeds will more rapidly invade it. Fill bare spots using a seed mixture of perennial rye grass.

Click above image for video content

Perennial rye grass seed bag



PERENNIAL RYEGRASS MIX 3-1-0

GRASS SEED BLEND/MIXTURE
LOT NO. 13020115

PURE SEED	VARIETY/KIND	GERMINATION	ORIGIN
19.50%	SILVER DOLLAR PERENNIAL RYEGRASS*	85%	OR
14.62%	MAJESTY II PERENNIAL RYEGRASS**	86%	OR
14.62%	UNO PERENNIAL RYEGRASS**	85%	MN

OTHER INGREDIENTS
0.25% OTHER CROP SEED
50.00% WATER SMART® PLUS FERTILIZER COATING
1.00% INERT FROM SEED
0.01% WEED SEED
NOXIOUS WEED SEEDS: NONE FOUND

*PVP PROTECTED VARIETY - UNAUTHORIZED PROPAGATION PROHIBITED
**PVP PENDING

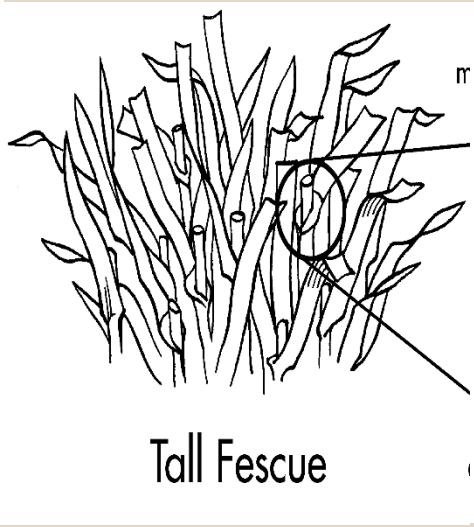
LOT NO. 13020115
TESTED: DEC. 2012 SELL BY: SEPT. 30, 2013
In FL SELL BY: JUL. 31, 2013
In MT, NE, SD, AND WY, SELL BY: DEC. 31, 2013
In AK,AZ,CA,CO,CT,DE,ID,IL,IN,MD,MN,NC,ND,NH, NJ, NV,NY,OH,OR,PA,UT,VA,VT, WA,WI AND DC, SELL BY: MAR. 31, 2014

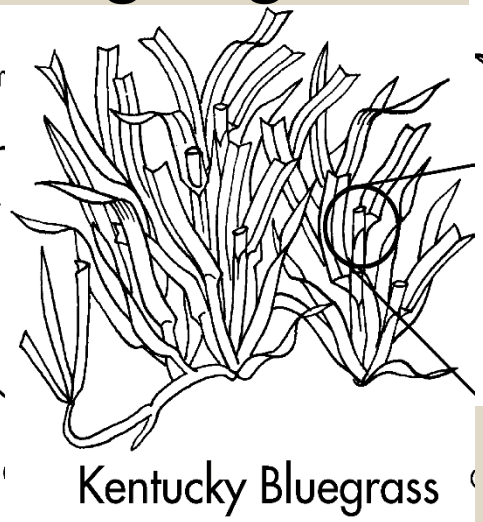
NET WT. 3 LB (1.36 KG)

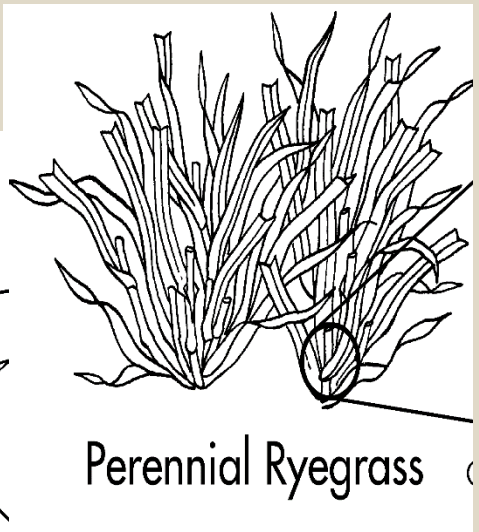
PERENNIAL RYEGRASS MIX 3-1-0
GUARANTEED ANALYSIS: F643
TOTAL NITROGEN (N) 3%
1.2% WATER SOLUBLE NITROGEN
1.8% WATER INSOLUBLE NITROGEN*
AVAILABLE PHOSPHATE (P2O5) 1%
DERIVED FROM ISOBUTYLIDENE DIUREA AND PORCINE BONE MEAL.
*PRODUCT CONTAINS 1.8% SLOW-RELEASE NITROGEN (N) FROM ISOBUTYLIDENE DIUREA AND PORCINE BONE MEAL

ALSO CONTAINS NON-PLANT FOOD INGREDIENT
1% CROSS-LINKED POLYMER

Choose the right grass

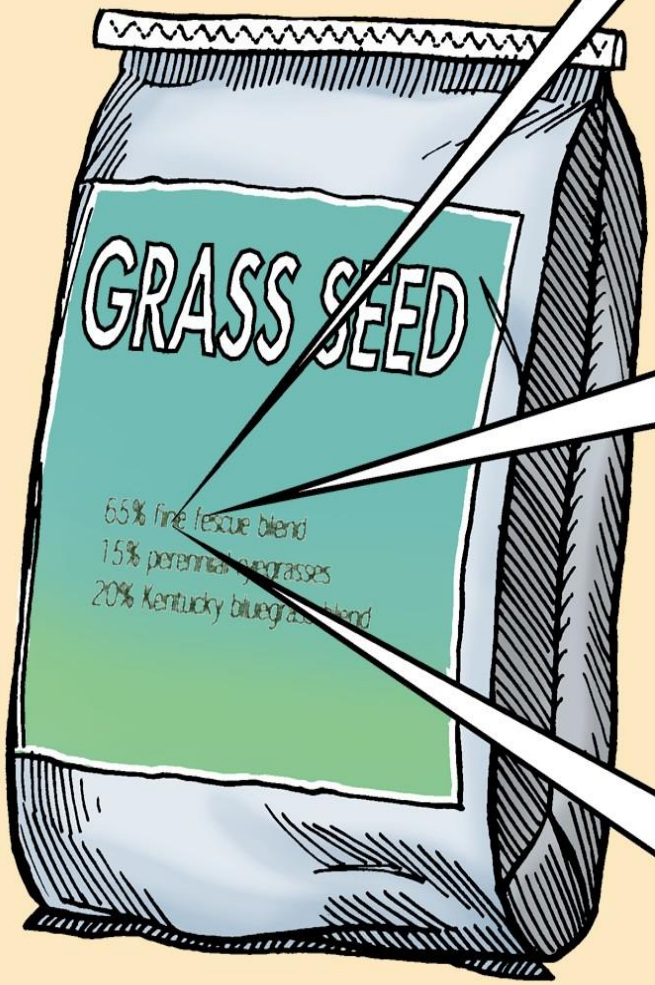






Cool season grasses	Fine Fescue	Tall Fescue	Kentucky Bluegrass	Perennial Ryegrass
Quality	Medium	Medium	High	Medium-High
Maintenance	Low	Low-Medium	Medium	Medium-High
Establishment	Average	Average	Slow	Rapid
Drought Tolerance	Some	Some	Poor	Fair
Shade Tolerance	Excellent	Good	Poor	Poor
Traffic Tolerance	Poor	Good	Good	Good
High Use Value	True Low Input Turf	Excellent for un-irrigated high use	Excellent for high use	Excellent for high use

Choose the right blend and mixes



Sunny, medium to high maintenance	
65% Kentucky bluegrass blend 15% perennial ryegrasses 20% fine fescues	3 to 4 lbs. per 1,000 sq. ft.

Sunny, low maintenance	
65% fine fescue blend 15% perennial ryegrasses 20% Kentucky bluegrass blend	4 to 5 lbs. per 1,000 sq. ft.
or	
100% tall fescue blend	7 to 10 lbs. per 1,000 sq. ft.

Shady	
100% fine fescue blend	4 to 5 lbs. per 1,000 sq. ft.

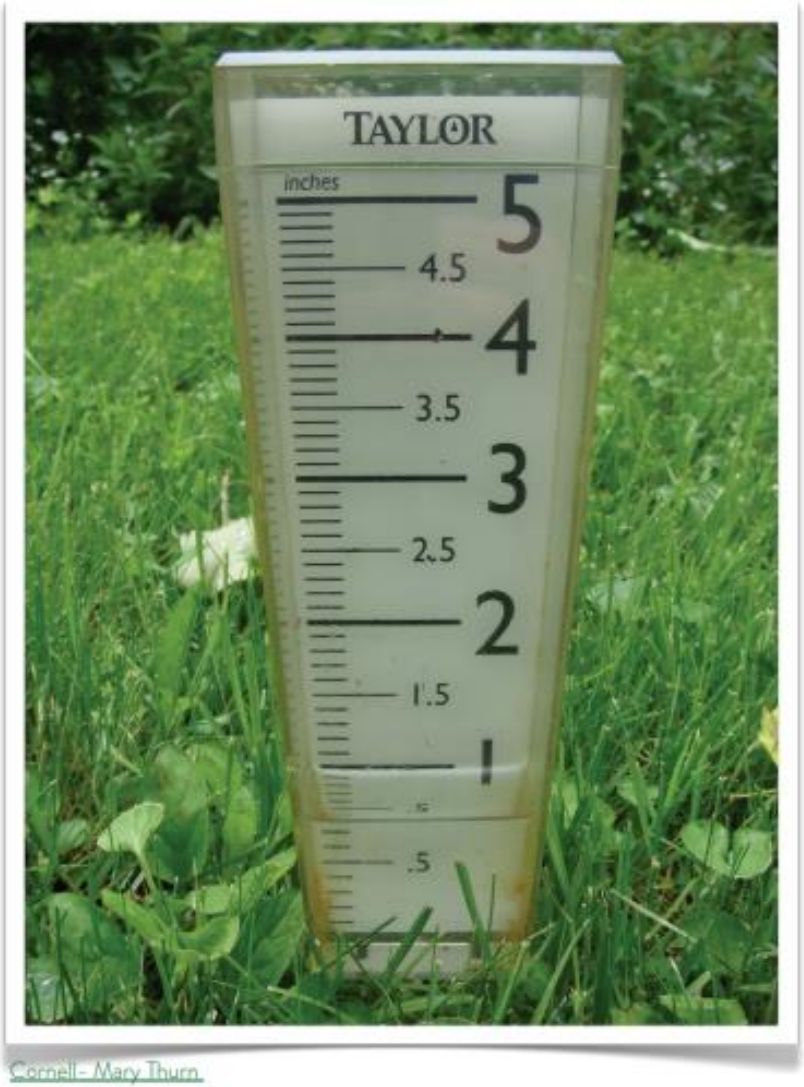
Step Three | Do Less

Skip Spring Feed.

If your lawn is thick with a dense cover of desirable grass that grows vigorously, do not apply spring feed (fertilizer). The lawn is getting enough nutrients released from the soil, grass clippings and a late season feeding.

Follow the Clump Rule.

Mow often enough to avoid piles of grass clippings. This might be every 5 days during the flush of top growth in spring, not at all during summer drought and every 7-14 days the rest of the growing season.



Cornell- Mary Thurn

Limit Watering.

Cool-season grasses slow growth under drought conditions. They may even turn brown but are likely not dead. Drough stress is rarely lethal as most lawns will survive on a fraction of an inch of water over a 3-week period. Use a rain gauge to measure your rainfall. During active growth apply supplemental irrigation to reach no more than one inch per week at a rate where all the water is soaked up with no puddles forming or running off. Choose a sunny morning to allow leaves to dry and minimize disease conditions.

In addition, moss thrives in damp wet soils. Limit watering and fix soil compaction in the area.

Live With Some Weeds.

Pulling weeds is easiest when the soil is moist.

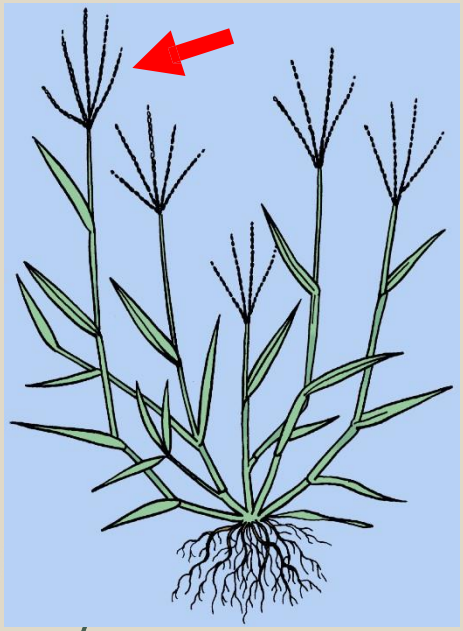
Be sure to remove the entire root system.

Don’t put seedy weeds into your compost.

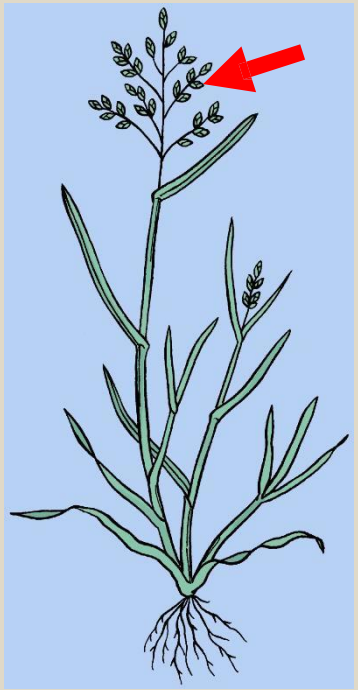
A targeted spray on young small weeds with the proper herbicide can be efficient. Be certain to properly identify the weed and read the herbicide product label to determine if the active ingredient(s) listed will kill the identified weed. **The label is the law.**

Your time and money will be wasted if you spray herbicide that is not effective for your specific weed issue.

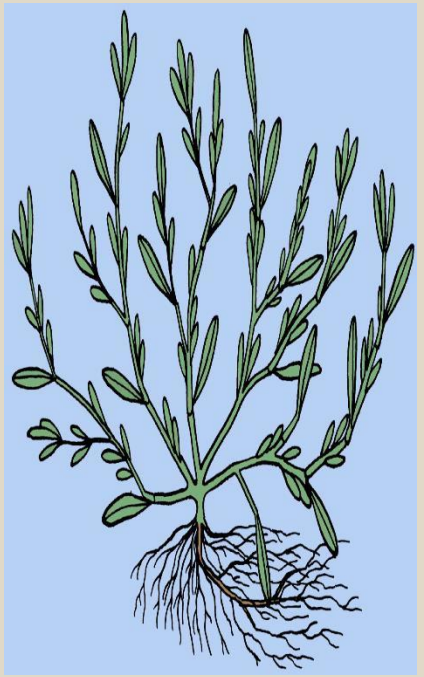
Annual Weeds



Crabgrass



Annual bluegrass

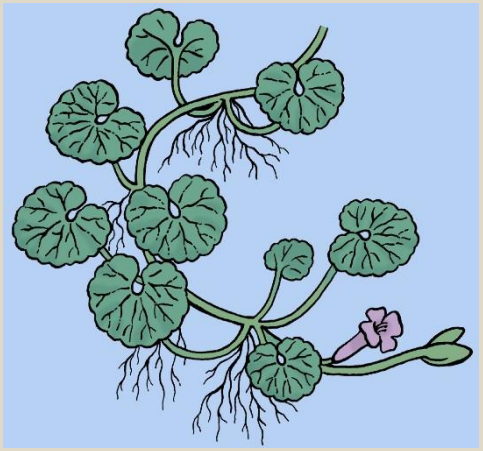


Knotweed

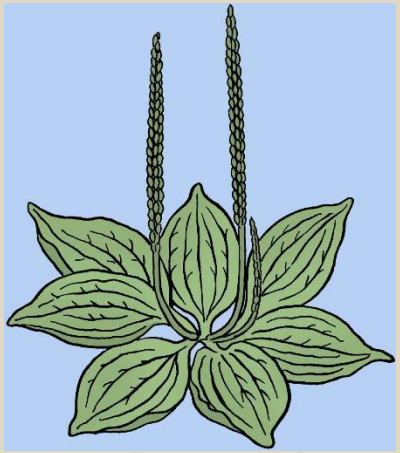
Perennial Weeds

Clover

Dandelion



Ground ivy



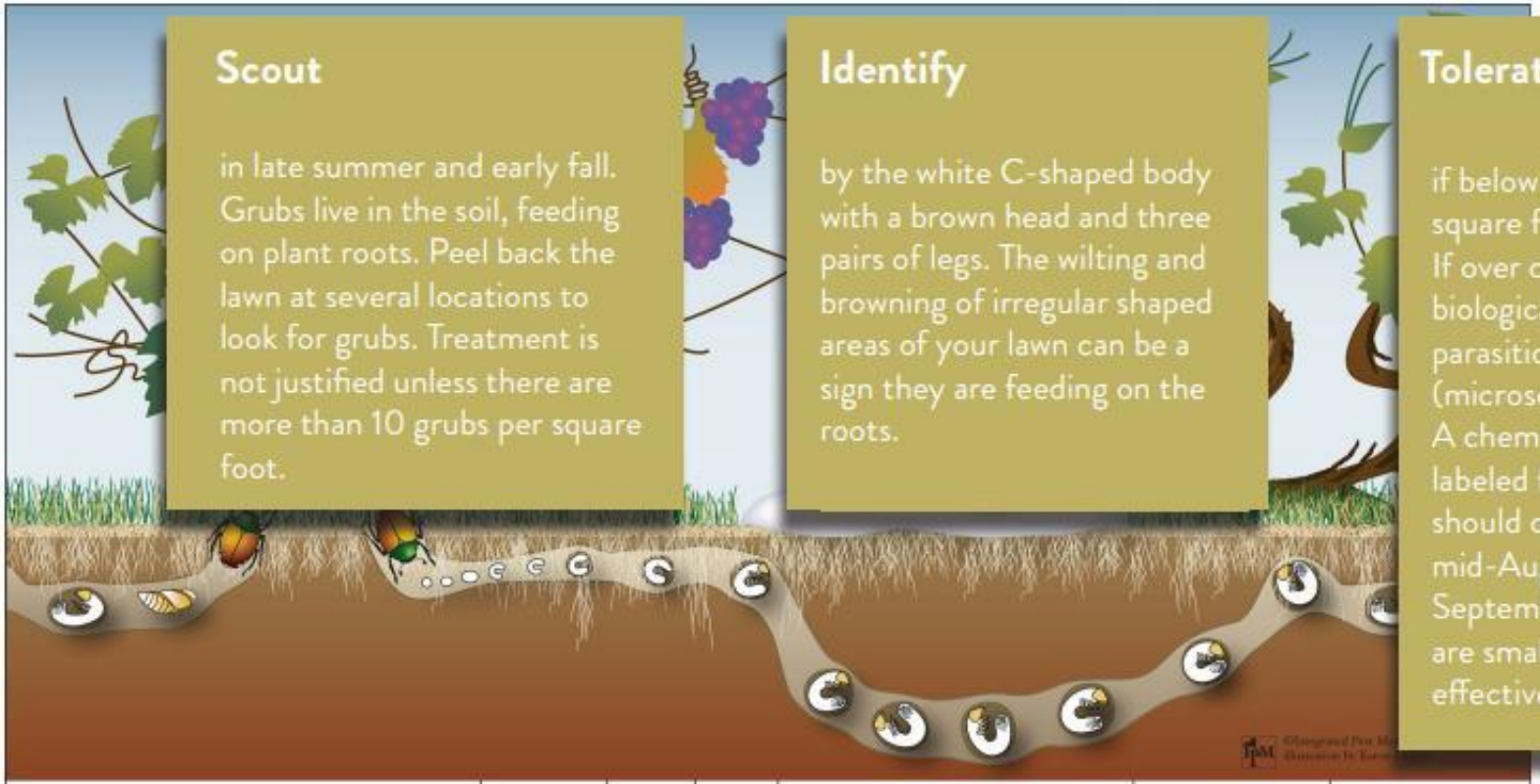
Plantain

Nutsedge

Manage pests and diseases when necessary.

Japanese Beetle: Integrated Pest Management Example

A properly mowed, watered and fertilized lawn may tolerate 10 to 15 grubs per square foot. The same number of grubs can devastate a weak lawn.



JUNE — JULY		AUG	SEPT	OCT	NOV — APRIL		MAY	JUNE
Pupation and adult emergence	Egg laying & hatching	Larval growth			Downward migration; hibernation; overwintering grubs		Upward migration; short feeding period; pupation	

More info: scouting video

Minimize Diseases with Best Practices

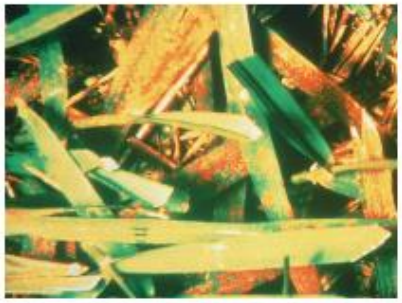
Disease Examples

Brown Patch
Summer

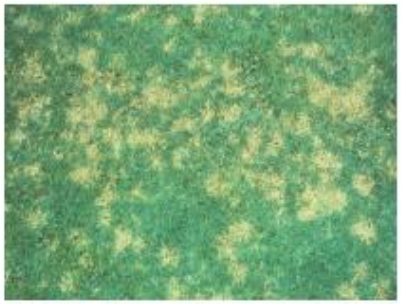
Gray Leaf Spot
Summer

Red Thread
Spring and Fall

Fairy Rings
Spring and Fall



Rust
Summer



Dollar Spot
Spring, Summer and Fall

Pythium Blight
Summer

Pink Snow Mold
Late Fall to Early Spring

- Use alternatives to grass in shady areas
- Avoid excess nitrogen - when nitrogen is needed, focus on late season feeding
- Limit leaf blade wetness by limiting watering to the morning and to achieve no more than 1 inch per week
- Choose disease resistant cool-season grass

Manage Pests Only When Necessary

Underground Feeders

Northern Masked Chafer
(larvae and adult)

European Chafer
(adult)

Oriental Beetle
(adult and grub)

Japanese Beetle
(adult and grub)

Lawn grubs feed underground on the roots of grass blades.

Surface Feeders

Hairy Cinch Bug

Bluegrass Bill Bug (larvae and adult)

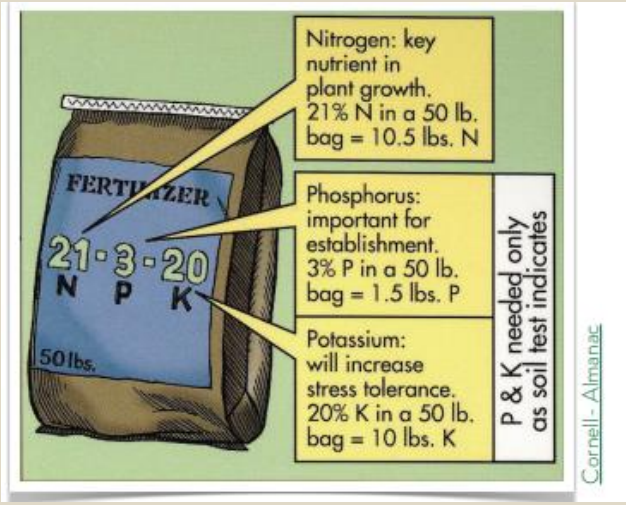
Sod Webworms (larvae)

Black Cutworms (larvae and adult)

Erwin C. Nielsen in IDNR

Whatever you do …
read and follow all label directions:

- Seeds
- Pesticides
- Fertilizers
- Equipment Operation
- Protective Gear



Protect the environment and yourself

- Kids and pets
- Birds and wildlife
- Pollinators
- Water: Avoid runoff and pollutants
- Soil: Avoid erosion and contamination
- Proper container disposal

Step Four | Use Alternatives

Grass is not a good choice for shade, popular paths and steep slopes.

- A minimum of 4 hours of direct sun is needed even for shade tolerant grasses such as fescues.
- For any grass to thrive concentrated foot or equipment traffic needs to be spread out. This includes varying mowing paths to distribute mower tire traffic.
- Managing mowing equipment over steep areas is a hassle and potentially dangerous, alternative cover minimizes risk.

Organic mulches (formerly living material) such as chopped leaves, straw, wood chips and shredded bark.

Inorganic mulches such as gravel and stones.

Shade-tolerant perennials, annuals, woodland natives and groundcovers such as Hosta species, impatiens, coleus, salvia, mosses, ferns, trilliums, wild ginger, lily-of-the-valley, sweet woodruff, and geranium (pictured).

Sun-loving groundcovers such as wildflowers, junipers, ivies and sedums.

For more options see:
Weed Suppressive Groundcovers

Replace Lawn with Gardens or Meadows

http://putnam.cce.cornell.edu/gardening/create-a-pollinator-paradise

Lawns in American Today

- Today's home lawns have historically been influenced by:
  - Displays of wealth and fashion
  - Implementation by landscape designers
  - Technology advances in mowing and grasses
  - Turfgrass research and education
  - Sports industry research and inventions

Lawns in America Tomorrow

- A good lawn can be achieved by following some simple guidelines.
- A good lawn today will be more resilient to future stresses and pressures.
  - Temperature extremes and fluctuations
  - Water extremes e.g. drought and heavy downpours
  - Invasive pests and new diseases
- Responsible lawn care protects our environment.
- Pollinator friendly alternatives exist.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MOWING AND GROWING FORWARD!