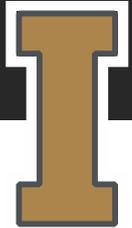
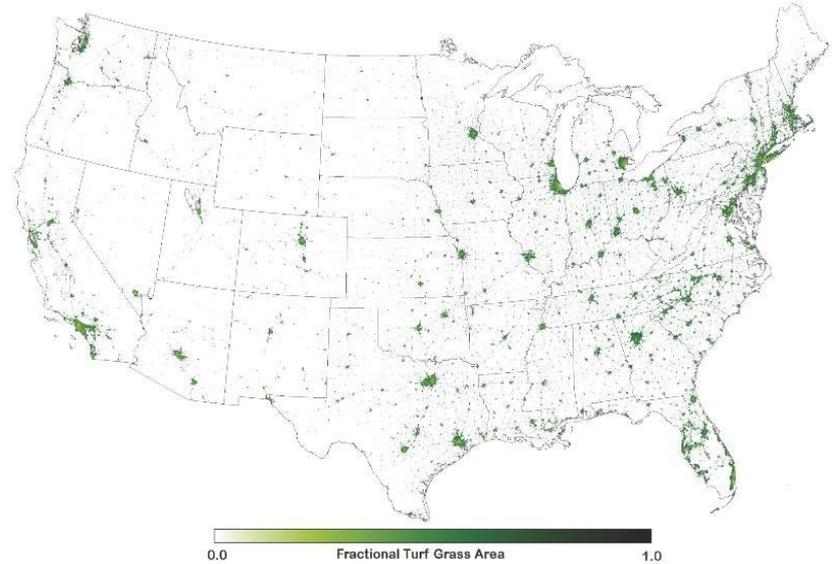


TURF MANAGEMENT

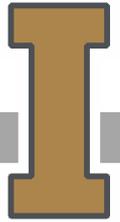


HOW MANY ACRES OF TURF IN US?

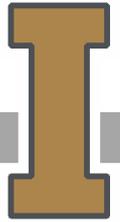
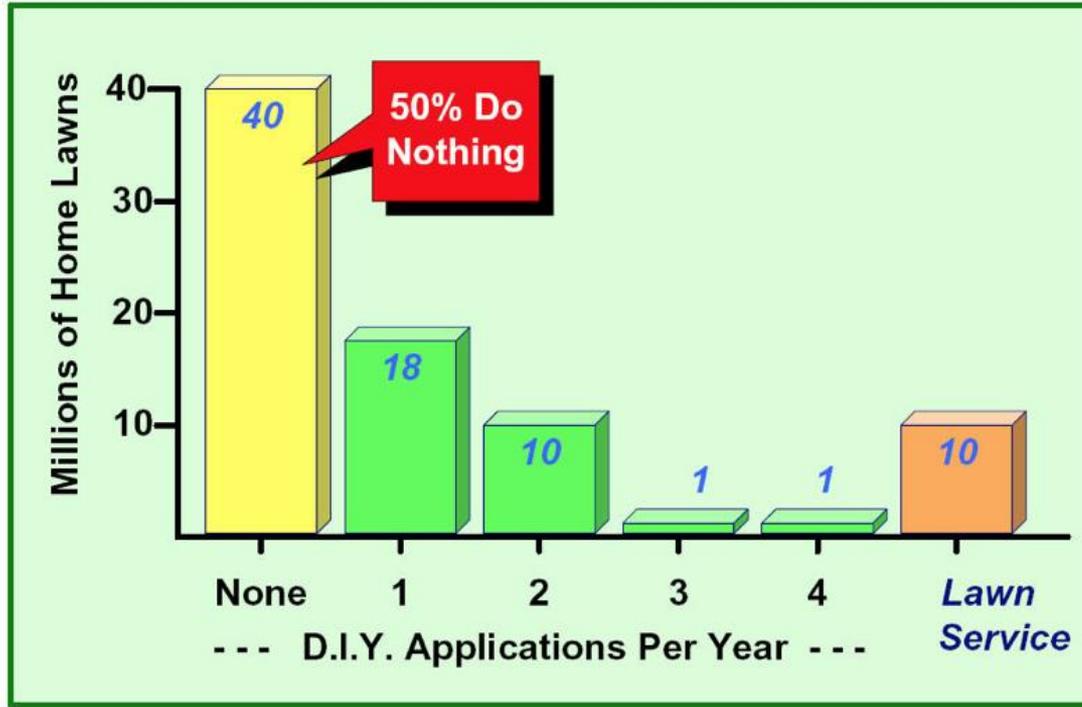
- ~41M Acres of turf in continental US.
 - Lawns, parks, golf courses, athletic fields
- 1.9% of continental U.S.
- 80 M home lawns
 - 30M acres



Milesi, C., S.W. Running, C.D. Elvidge, J.B. Dietz, B.T. Tuttle, R.R. Nemani. 2005. Mapping and modeling the biogeochemical cycling of turf grasses in the United States. *Environmental Management* 36(3), 426-438.



HOME LAWN CARE



BENEFITS OF TURFGRASS

Oxygen production/carbon credit

Reduced leaching

Reduced erosion

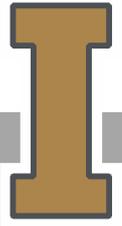
Cooling

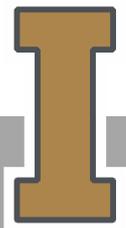
Pollutant absorption

Pesticide degradation

Stops mud

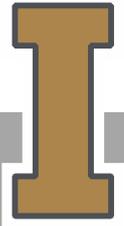
Home barrier





TURFGRASS DISORDERS: NON-PEST

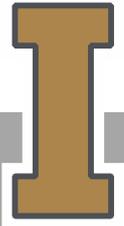
- Improper species selection
- Lack of air movement
- Too hot, dry or wet weather
- Too much or not enough nutrients
- Soil compaction
- Competition from other plants
- Too much thatch
- Improper height of cut
- Too much or little sunlight
- Poorly maintained mower
- Improper irrigation



CAUSE OF PROBLEMS

Improper management

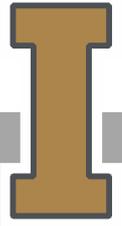
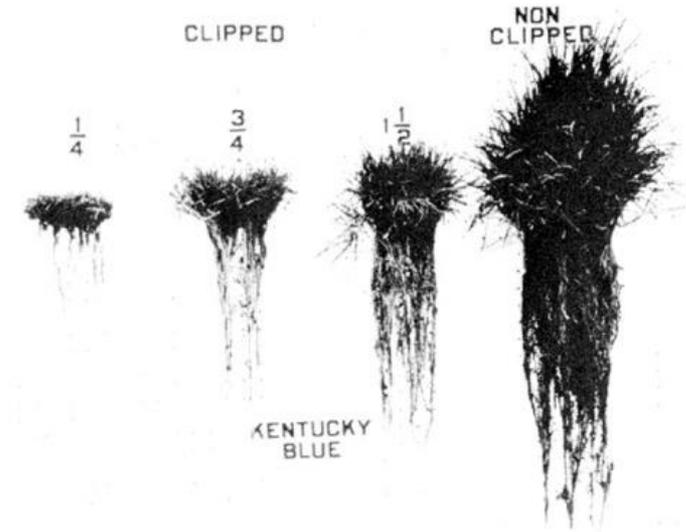
- Mowing: Too short, not often enough
- Fertilizer: Wrong time, improper amount
- Irrigation: Improper amount, coverage
- Thatch: Complicates care
- Soil compaction: Unhealthy roots = unhealthy grass
- Pests: Healthy plants have fewer pests
- Species: Right plant, right place



MOW IT HIGH!

2 to 3 ½ inches

- Healthier and deeper roots
- Less heat and drought stress
- Fewer weeds, insects and disease
- Less frequent mowing
- Increased water infiltration, less runoff
- Reduced potential for fertilizer leaching and runoff
- Early / late season exceptions



Fine Fescue Mowing Height Study

3 inches

1.5 inches



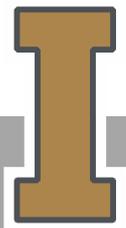
Crabgrass and yellow foxtail

MOW FREQUENTLY!

Follow the 1/3 rule:

- Never remove more than 1/3 of the turf's height in a single cutting.
- Healthier for the plant
- Fewer pest/disease problems
- Better looking lawn

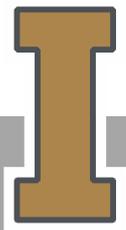
Important: Sharp blade



LEAVE THEM LIE!

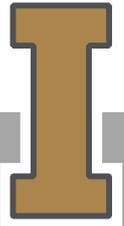
Leave grass clippings:

- Recycles nutrients
- Provides OM
- Less rubbish in landfills
- Keeps pesticides in lawn
- Clippings **do not** cause thatch!



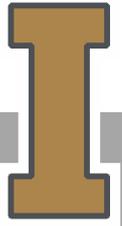
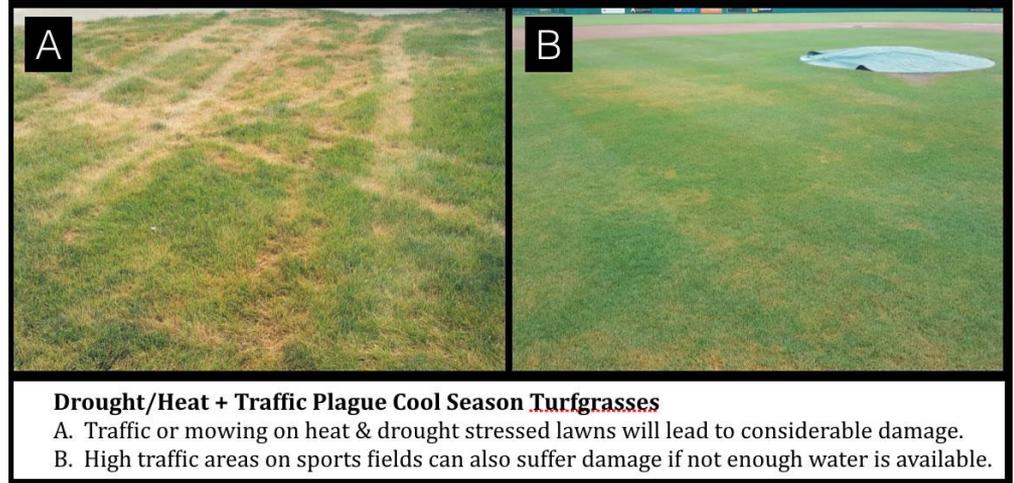
LEAVE THEM LIE! EXCEPT...

- When you have to violate the 1/3 rule.
- You use the clippings for some beneficial purpose (compost, mulch)
- On high maintenance turf. (Golf greens, tennis courts)



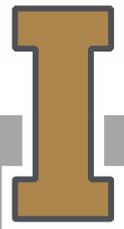
AVOID MOWING A STRESSED LAWN

- Wheels and even your feet can kill the leaves in drought and heat stressed turf
- Mow when it is cooler...early morning, evening
- Irrigate today, mow tomorrow



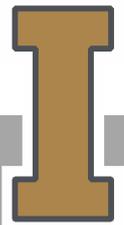
KEEP YOUR BLADES SHARP

- Shredded/torn leaves turn gray or brown
- May look drought stressed
 - Increased water to green up
- Sharpen at least yearly! 3X is better
- Common issue on fescue
- Increases chance for disease infection



FERTILIZATION

- Nitrogen is most important nutrient
- P, K, as soil test indicates need
- Recycling grass clippings will recycle substantial N, reducing need for fertilizer application by 25 to 40%.
- Younger lawn +traffic = ^ fertilizer



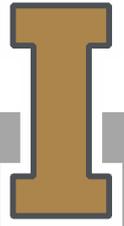
FERTILIZATION– NOT ENOUGH

Poor color and vigor

Doesn't recover from traffic (playing kids, dogs)

More weeds (clover)

Certain disease become a problem (rust, dollar spot)



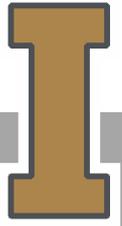
FERTILIZATION- TOO MUCH

More mowing, clippings

Needs more water

More thatch, more quickly

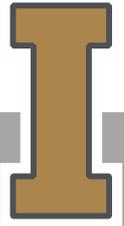
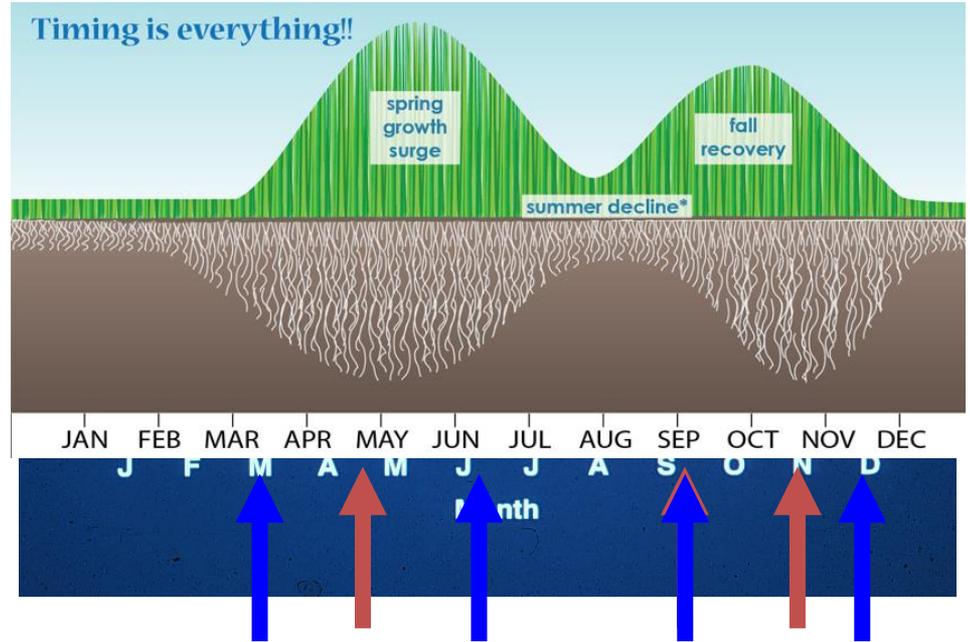
Certain diseases become a problem (Necrotic ring spot, leaf spot)



FERTILIZATION: WHEN?

Cool Season:
Bluegrass, Fescue.

- Fall
- Late Spring
- Little in summer



FERTILIZER BURN

Don't apply to wet or stressed turf

Apply evenly

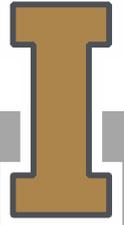
Don't spill

Use granules or pelleted vs. pulverized

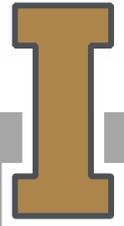
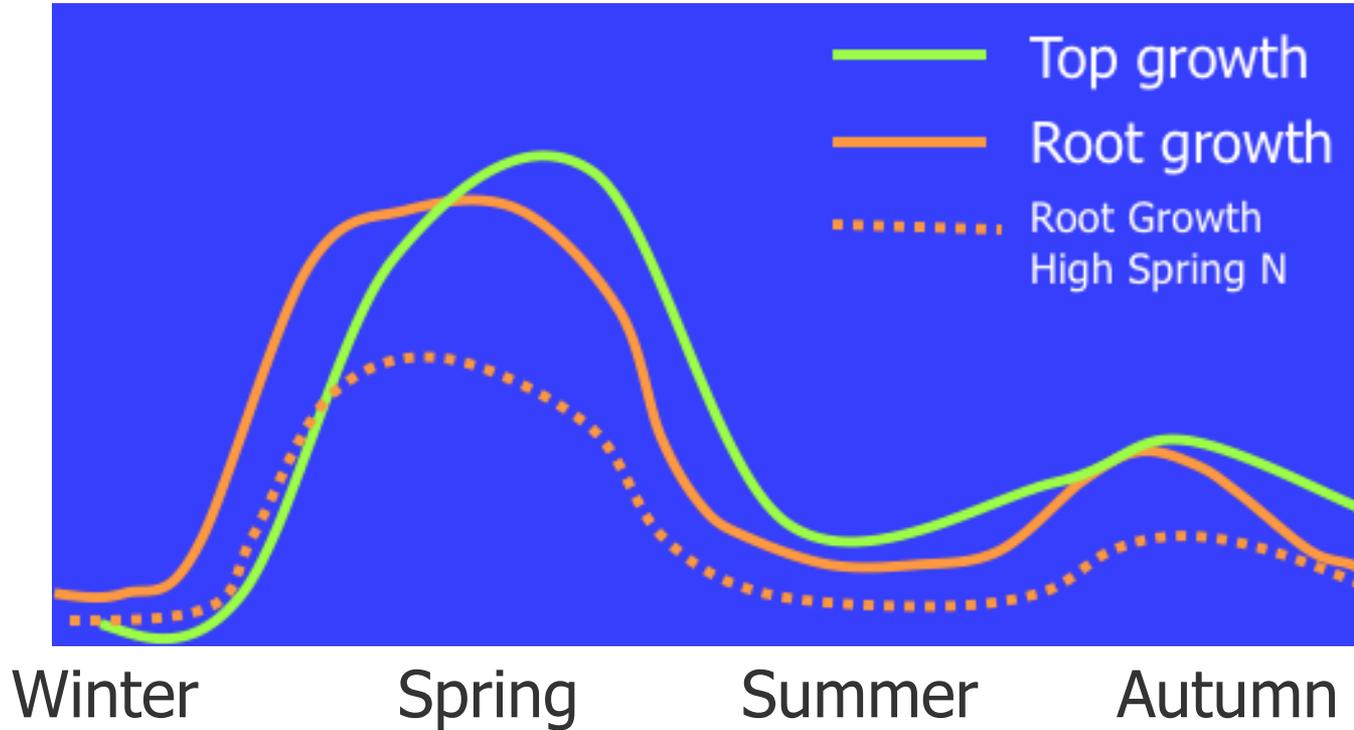
Water-in soluble fertilizers

Use insoluble, organic forms

Apply no more than 1 lb./1,000 sq. ft. per application



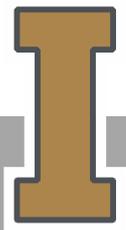
COOL SEASON TURF ROOT AND SHOOT DEVELOPMENT



FERTILIZER: WHAT IS THE BEST?

There is no “best” fertilizer.

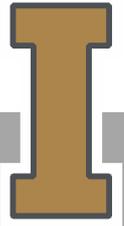
- Plants do not distinguish between synthetic/ organic/ brand
- All fertilizers are effective on Idaho lawns
- Apply the right amount at the right time



COMMON PROBLEMS

Nitrogen deficient

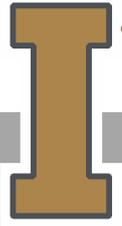
- Thin turf
- Weeds
- Disease
- Low growth rate
- Light green/yellow color



PHOSPHORUS

Do we need it in Washington or Idaho soils?

- Simplot
- Bans on phosphorus fertilizers
 - 16 states.
 - Causes algae blooms in water
 - Common cause
 - Cigarette butts
 - Plant debris in storm drain

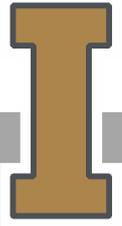


IRRIGATION MANAGEMENT

Based upon

- Temperature
- Evaporation plus transpiration
- Good system and coverage

April	.5"
May	.75"
August	1.5"
September	1"

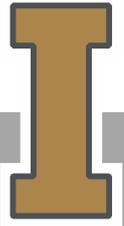


IRRIGATION MANAGEMENT

When?

- Foot printing
- Blue/grey cast
- Scorch/brown
- Dormant

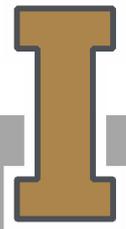
Use the screwdriver test



WATERING 101

Too much water:

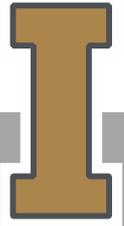
- Squishy
- Shallow roots
 - Decreased drought and pest tolerance
 - Increased need for fertilizer
 - Increased thatch production
 - Increased weeds
- Soil compaction
- Thatch



WATERING 101

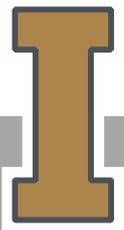
Not enough water:

- Less dense
- Not as green
- Poor wear tolerance
- Tracking
- Increased pest pressure



WATERING 101

- ✓ Apply enough water to wet the top three inches of soil profile (0.2" water for silt loam)
- ✓ Water again when you see signs of wilt or drought stress on the lawn or by schedule
- ✓ Apply enough water to wet the top three inches of soil profile (0.2" water for silt loam)
- ✓ Water between 9PM and 9AM, if possible
- ✓ Check distribution pattern if specific dry spots persist

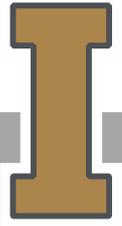


MYTHBUSTING

Watering at night causes disease development

The basis for the myth:

- Water doesn't evaporate as quickly at night, thus leaving a wet surface on the plant
- Fungus is a stealthy organism and prefers the darkness of night (hello...refrigerator)
 - Mildew
 - Dollar spot
 - Leaf spot
 - Pythium

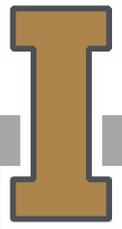


WATERING 101

The truth:

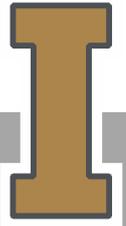
Watering at night in Wa/Id arid climate is a good thing

- The dewy “sugary” substance (guttation fluid) that forms on the leaf surface is washed off; this CAN cause fungus in more humid climates—but not here
- Water pressure is better
- Reduces evaporation
- Less windy



WATERING 101

✓ You can't evaluate sprinkler system performance simply by watching it!



THATCH MANAGEMENT

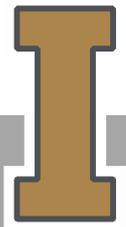


leaves

crown

thatch

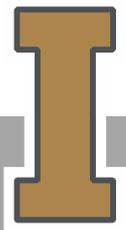
soil



THATCH MANAGEMENT

Factors:

- Bluegrass lawns form thatch...fescue and ryegrass lawns do not
- Thatch forms more quickly on bluegrass lawns that are overwatered and fertilized too much
- If you have a bumpy lawn from nightcrawlers, you won't have thatch



THATCH MANAGEMENT

Mechanical removal

- Power-raking, dethatching
- Do early, before greenup
- Effective for removing small amounts of thatch
- Don't be too aggressive

Core cultivation (aeration)

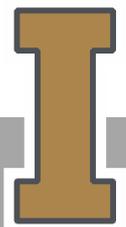
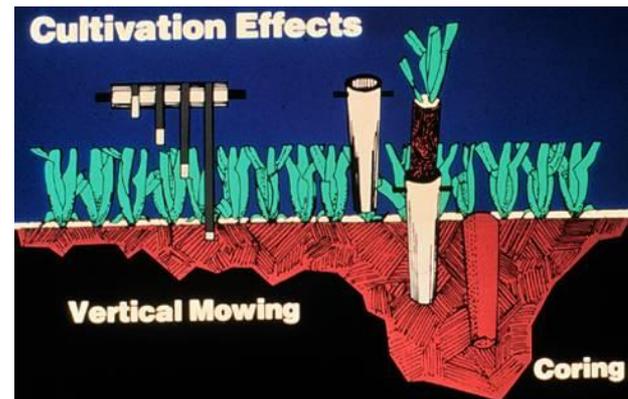
- Recommended practice
- Spring and/or fall
- Also relieves compaction

Topdressing

- Difficult to do correctly
- Leave to the pros

Biological dethatchers

- They don't work!





CORE AERATION

Can be done spring and/or fall

Important to pull a plug – not just poke a hole

Holes should be close together – no more than 2-3 inches apart

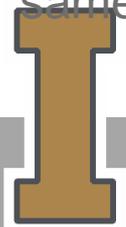
Holes should be 2-3 inches deep

Water lawn well about 2 days prior to aerating

Plugs should be left to fall apart if the lawn has a thatch layer

Plugs can be collected if there is no thatch in the lawn

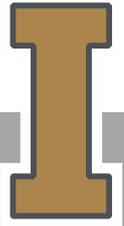
Can put down seed and fertilizer (if needed) at the same time



CORE AERATION

Benefits

- Manages thatch
- Reduces compaction
- Increases gas exchange
- Enhances water infiltration
- Improves root growth
- Provides ideal environment for seed germination



BEST TURF???

- Intended use of the turf
- Desired quality level
- Willingness, ability to provide adequate care
- Availability of resources (water, money, time)
- Soil or water problems (salt)
- Shade (old homes, mountain homes)
- History of pest problems (Necrotic ring spot)
- Elevation (limits the use of buffalograss)
- Availability of seed or sod



ORGANIC TURF MANAGEMENT

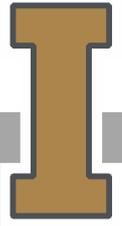
Numerous fertilizers

- Low N analysis (< 20% N)
- High cost per unit of nitrogen
- Mined sources of P, K, S, Ca, Fe, micros

Few effective pest control products

Biostimulants

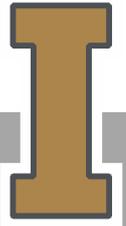
Most organic products (some fertilizers, most pesticides) are produced and sold by small companies



ORGANIC WEED CONTROL

Corn gluten meal

- Preemergent herbicide activity
- Excellent N source
- ~ 1.00/pound
- Use rate 15-20 pounds/1000 sq. ft.



ORGANIC WEED CONTROL

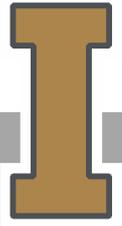
High use rates (12-20 lb/1000 ft²)

One to two applications/yr

Expensive - \$25-\$45 per application/1000 ft²

Pre-emergence effect only

Controls some annuals... kind of
20 lbs. CGM/1000 equals 2 lbs. N

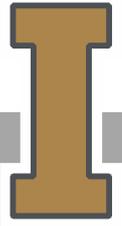


POST EMERGENCE HERBICIDE

- Clove Oil
- Sodium laurel sulphate
- Vinegar (20 % Acetic Acid)
- Lecithin,
- Citric acid,

Non-selective

Are they REALLY dead?





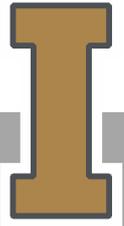




GRASSES

Species and varieties differ in:

- Appearance
- Wear tolerance
- Maintenance requirements
- Pest susceptibility
- Site tolerance

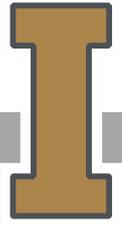


Blend:

- 2 or more grasses of the same species
 - Glade + Bristol + Cheri Kentucky bluegrasses

Mixture:

- 2 or more different species
 - Kentucky bluegrass + perennial ryegrass



PLANTING PROCEDURES

Eliminate weedy perennial grasses

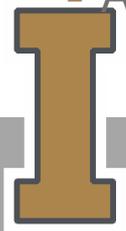
- Quackgrass, bentgrass

Rough grade to correct slope

Amend soil if needed

Analyze soil

- Adjust nutrients and pH



PLANTING PROCEDURES

Work soil to depth of 6 inches

Remove stones and debris

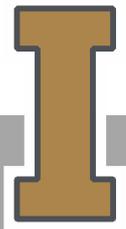
Smooth grade area

Apply starter fertilizer

Plant:

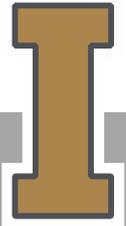
- Late summer is best

Rake, mulch, water the seedbed



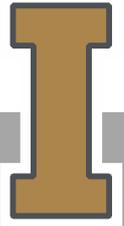
WATERING

- ❑ Amount and frequency depends on weather conditions.
- ❑ Keep moist - NOT wet.
- ❑ Decrease amount and frequency as roots develop.



MOWING

- ❑ Mow as soon as desired height is passed.
- ❑ Keep blades sharp and properly adjusted.
 - Dull blades may pull up seedlings



POST-PLANTING CARE

Watering

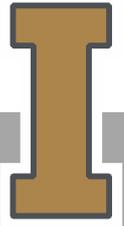
Mowing

Fertilizing

Pest management



Healthy Turf



SHADED TURFGRASS



Satisfactory

- rough bluegrass, fine fescue

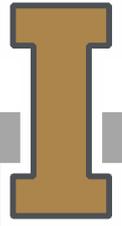
Fair

- tall fescue, perennial rye

Poor

- Kentucky bluegrass

Varieties make a difference



SHADED TURFGRASS

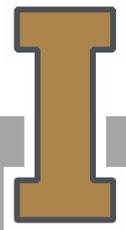
Tree and shrub roots compete for water and nutrients.

Tree canopies = umbrella.

High humidity can increase disease.

Suggestions:

- Trim trees, reduce fertility, use tolerant grasses, mow high, irrigate carefully
- Plant ground covers



https://www.youtube.com/watch?v=K_RM2lgwk5o

Integrated Pest Management for Turfgrass