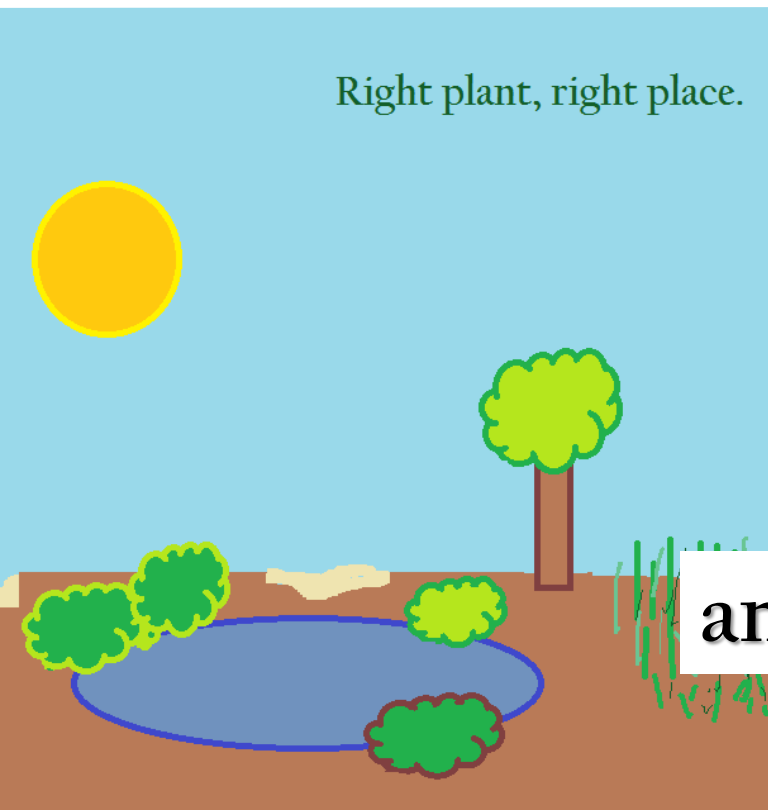


Turfgrass IPM

* All images unless otherwise noted are from Wikimedia commons image search

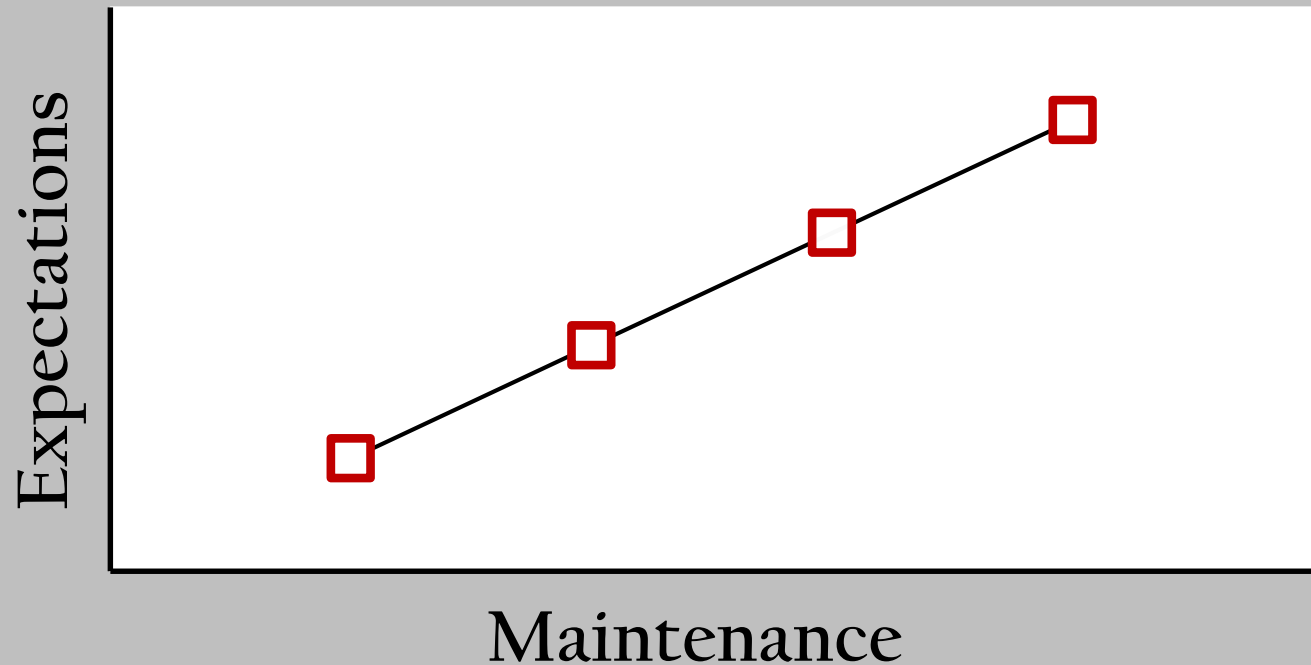
What to consider?

Right plant, right place.



and

Realistic level of maintenance



Turfgrass IPM

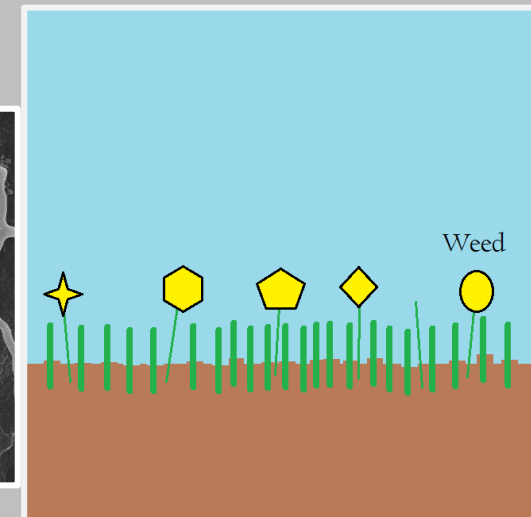
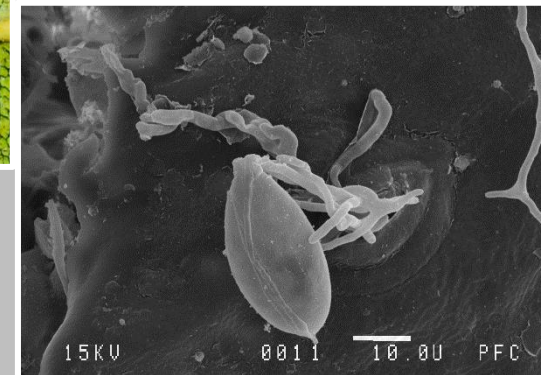
What to consider?

Cultural practices:

1. **Mowing**
2. **Fertilization**
3. **Irrigation**

influence

Pest, disease, and weed levels



Transferring IDMM

Control

Cultural practices:

1. Mo
2. Fe
3. Irr

Deer disease and weed levels

**Assess risk /
mitigate damage**

Turfgrass IDA

hello

[REDACTED] I took the time last summer and fall and removed the existing lawn, rototilled, brought in sand, top soil and peat moss and planted a great lawn. It remained a beautiful dark green throughout the winter until recently.

Initially I noticed a few yellow patches which I interpreted for dog or deer urine. Over the past 2 weeks the spots have increased to alarming levels. I direly need some assistance to resolve this. I understand I have some weeds coming up that I can rectify but the other scares me. My lawn has been heralded as the nicest in the area and if I lose it I will be beside my self.

I have included some photos of showing conditions. There are spots more infected than shown. Is it possible for a turf grass expert like yourself to come and inspect and advise.

On pins and needles

[REDACTED]

Turfgrass IPM

* Photos courtesy of wikicommons

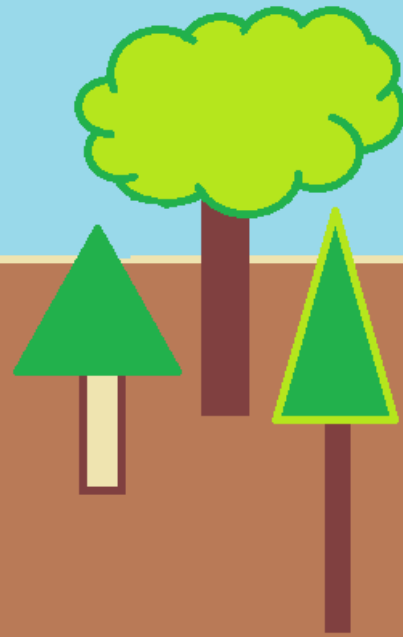
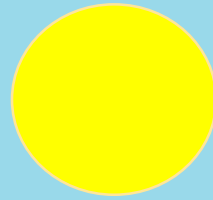


40 million acres nationwide

- **2 % of total land in the U.S.**
- **Largest irrigated crop in the country**

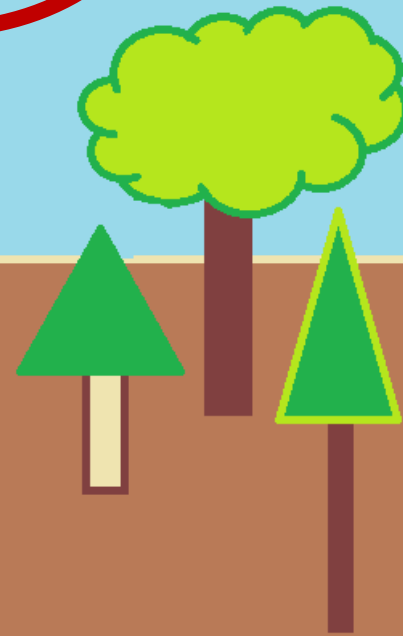
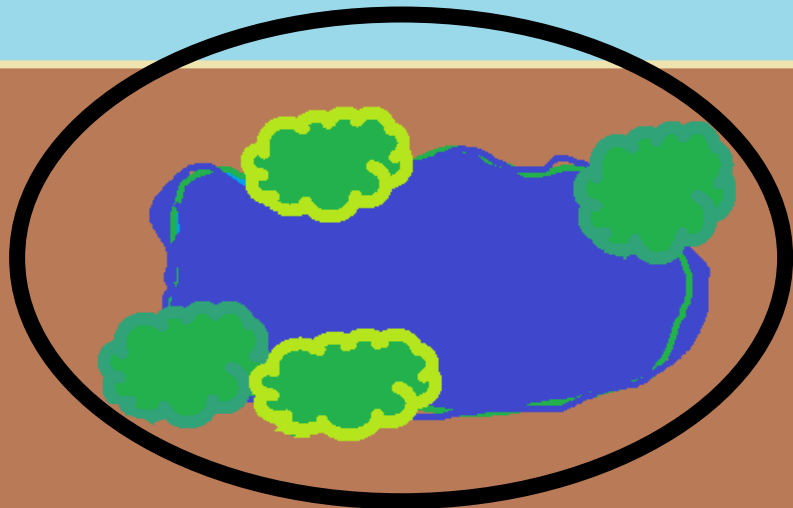
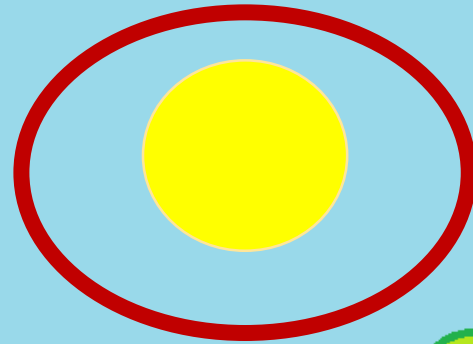
Turfgrass IPM

Right plant, right place.



Turfgrass IPM

Right plant, right place.



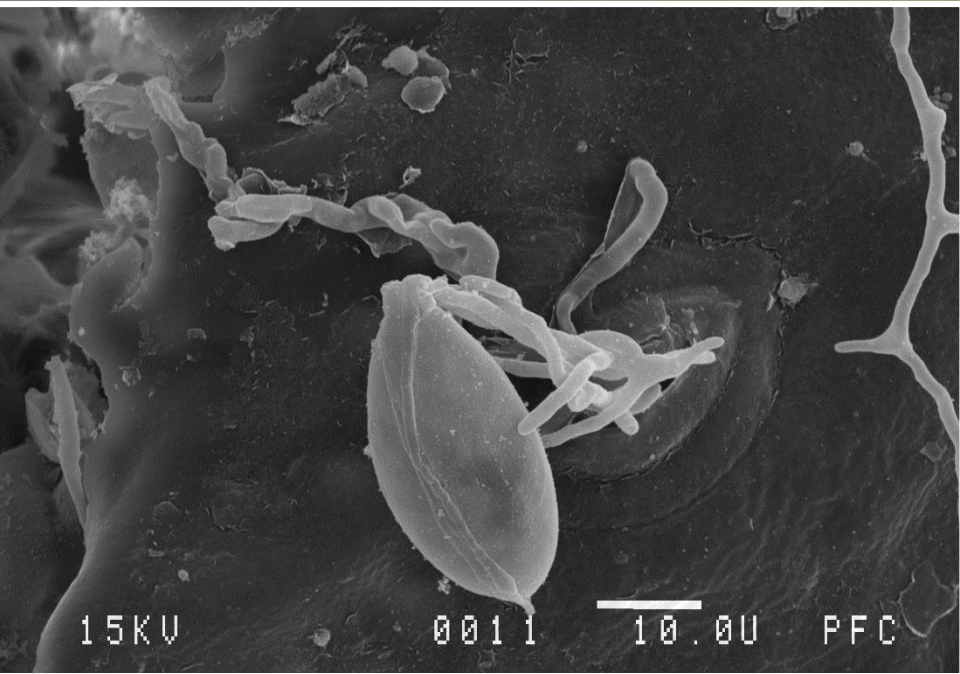


SUPPORT
OUR TROOPS

Pests

1. Insects

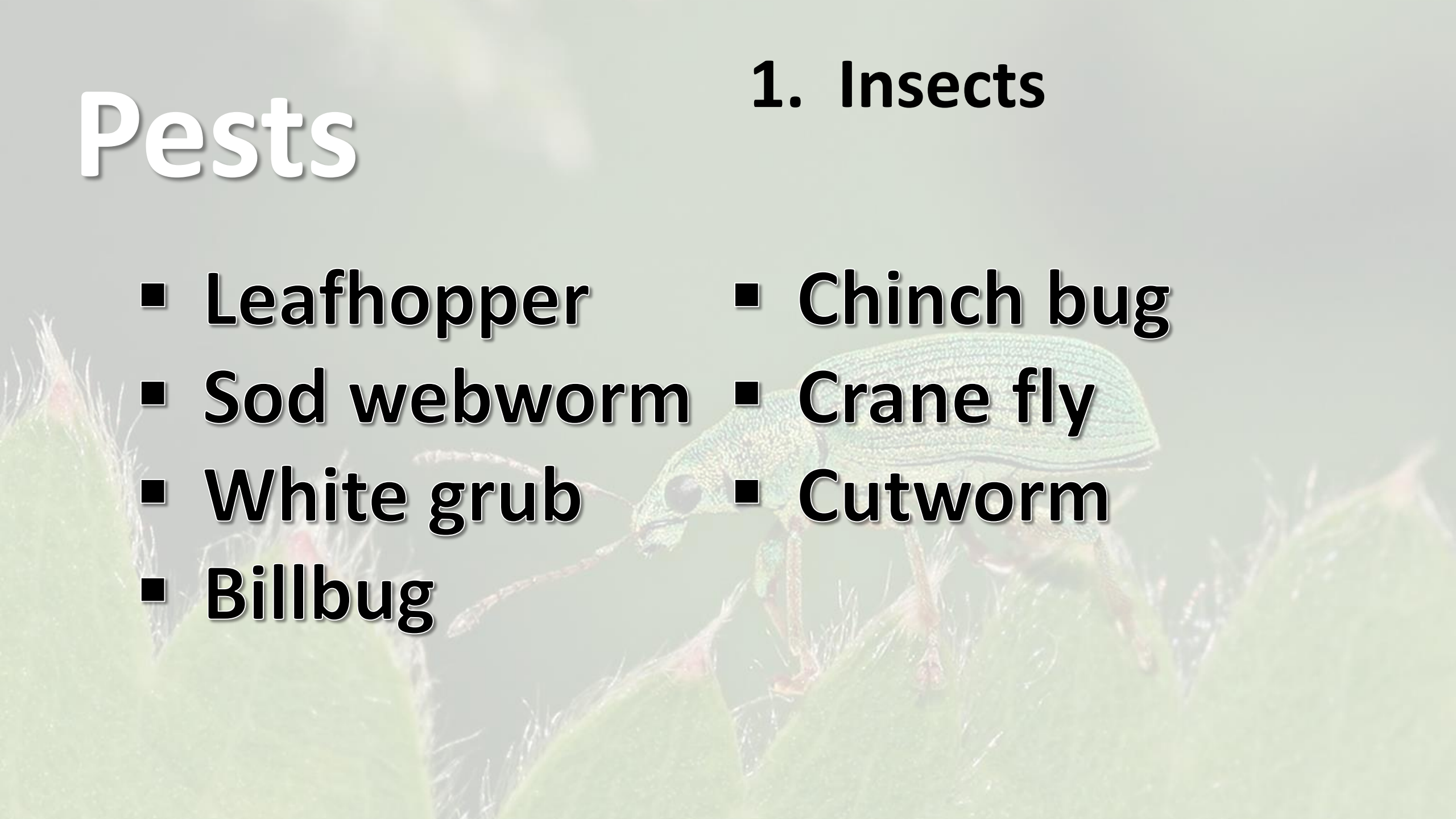
2. Fungi



Pests

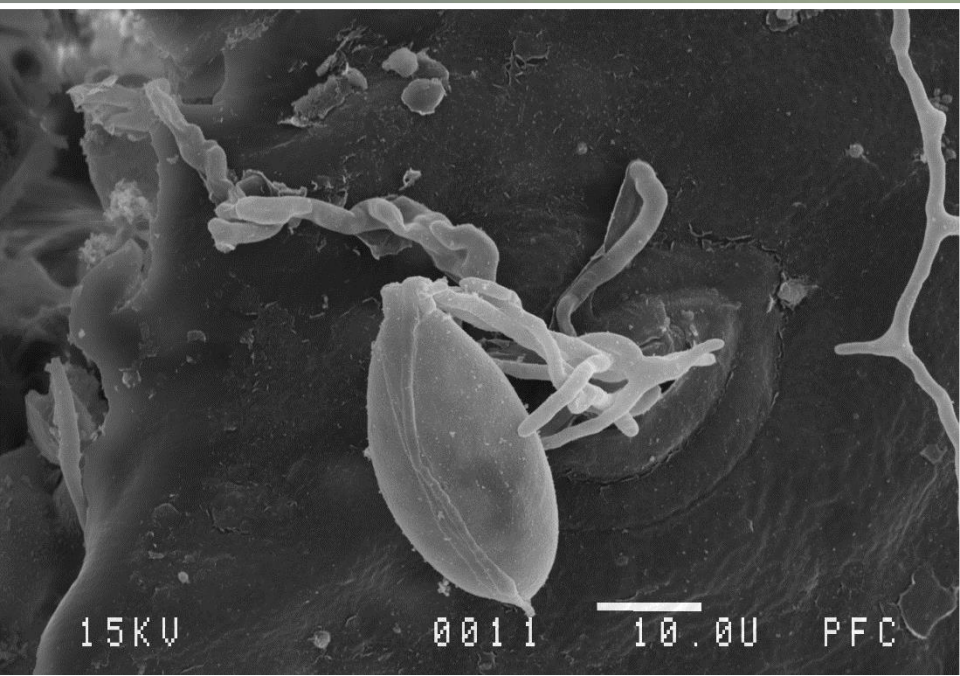
1. Insects

- Leafhopper
- Sod webworm
- White grub
- Billbug
- Chinch bug
- Crane fly
- Cutworm



Pests

2. Fungi



Pests

A green beetle is shown on a corn cob, which is the background of the slide. The beetle is positioned in the center, facing left. The corn cob is partially visible on the left side of the frame.

2. Fungi

- Anthracnose
- Brown blight
- Brown patch
- Curvularia blight
- Damping off
- Dollar spot
- Downy mildew
- Fairy ring and mushrooms
- Microdochium patch
- Necrotic ring spot
- Powdery mildew
- Pythium
- Red thread
- Rusts
- Take-all patch
- Yellow patch
- Yellow tuft

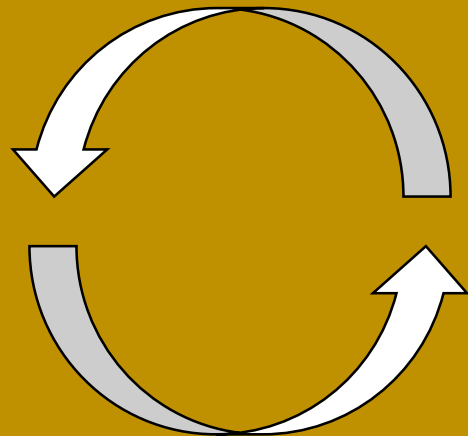
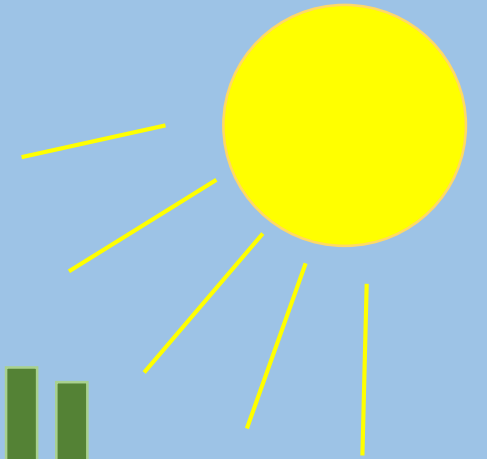
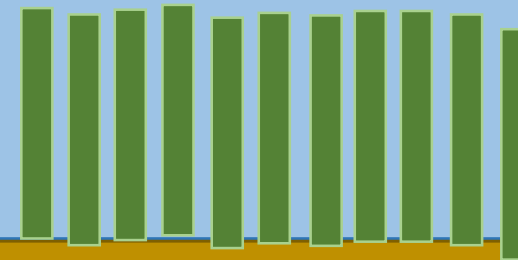
Weeds

- Bindweed
- Buttercup
- Chicory
- Chickweed
- Clover
- English daisy
- Henbit
- Knotweed
- Lambsquarters
- Pineapple weed

- Plantain
- Purslane
- Shepherdspurse
- Red sorrel
- Speedwells
- Spurge
- Thistle
- Woodsorrel
- Yarrow

Ecological perspective

Soil



Decay

Microbial

Nutrients





- **1.25 to 1.5 (in)**

- **1.5 to 2**

- **0.375 to 1**

- **-**

- **1.25 to 1.5**

- **1.25 to 1.5**

**Fine fescues
(chewings, creeping,
and hard)**

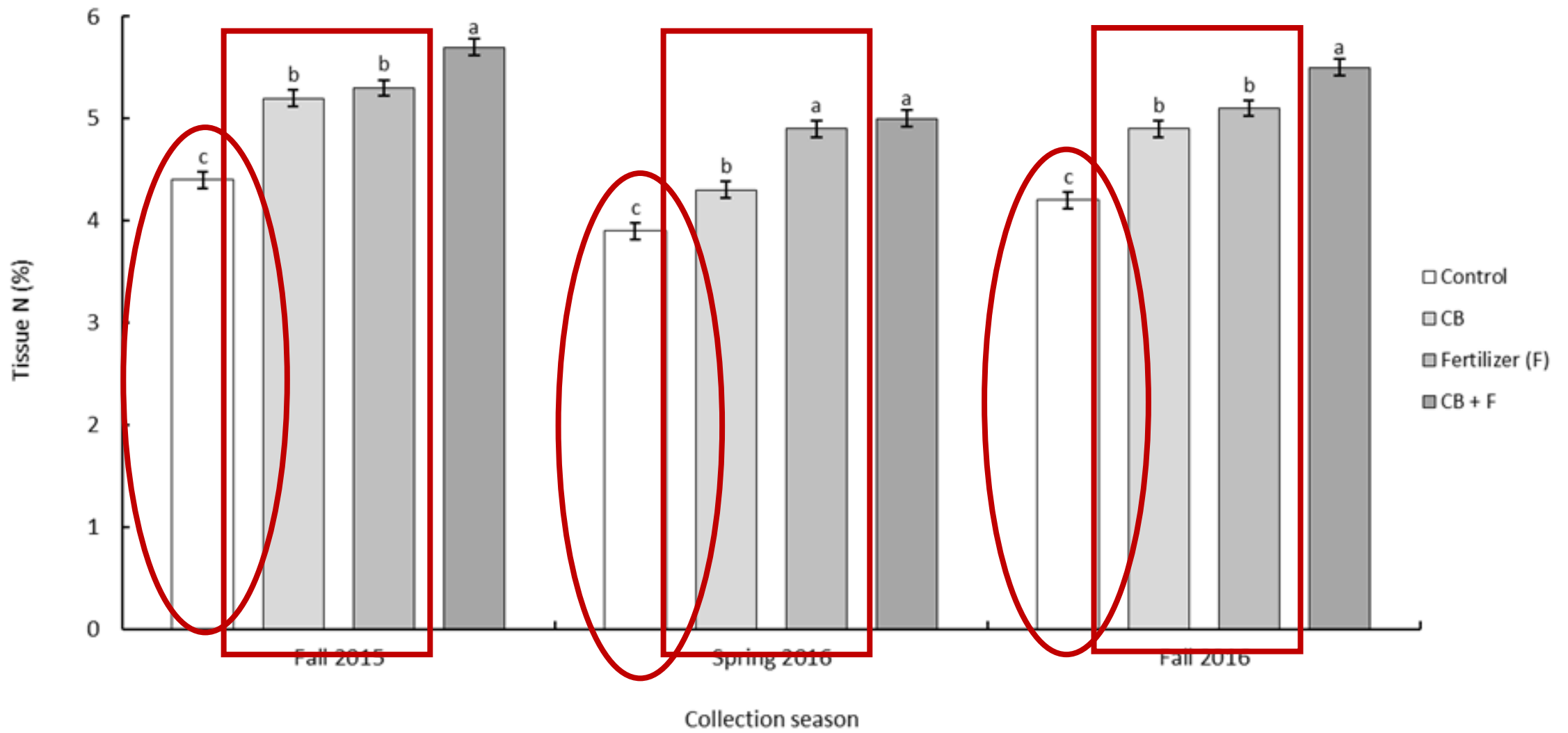
Tall fescue

Colonial bentgrass

Creeping bentgrass

Kentucky bluegrass

Perennial ryegrass



Fertilization

Major concerns:

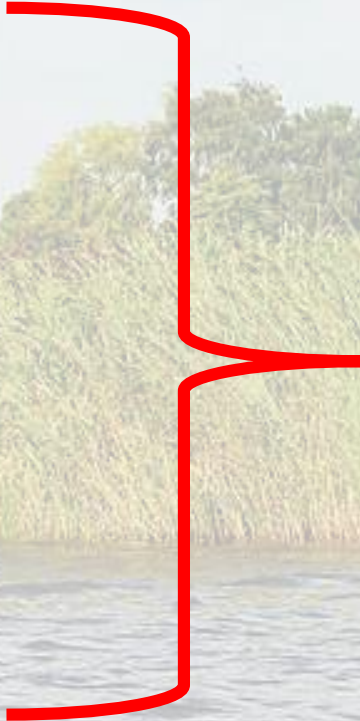
- **Over application leads to succulent turfgrass**
- **Under application may lead to less competitive growth**

Irrigation

1. Timing

2. Rate

3. Type



Highly variable and dependent upon site conditions

Irrigation



conce

suitable e
l pests al

ce comp



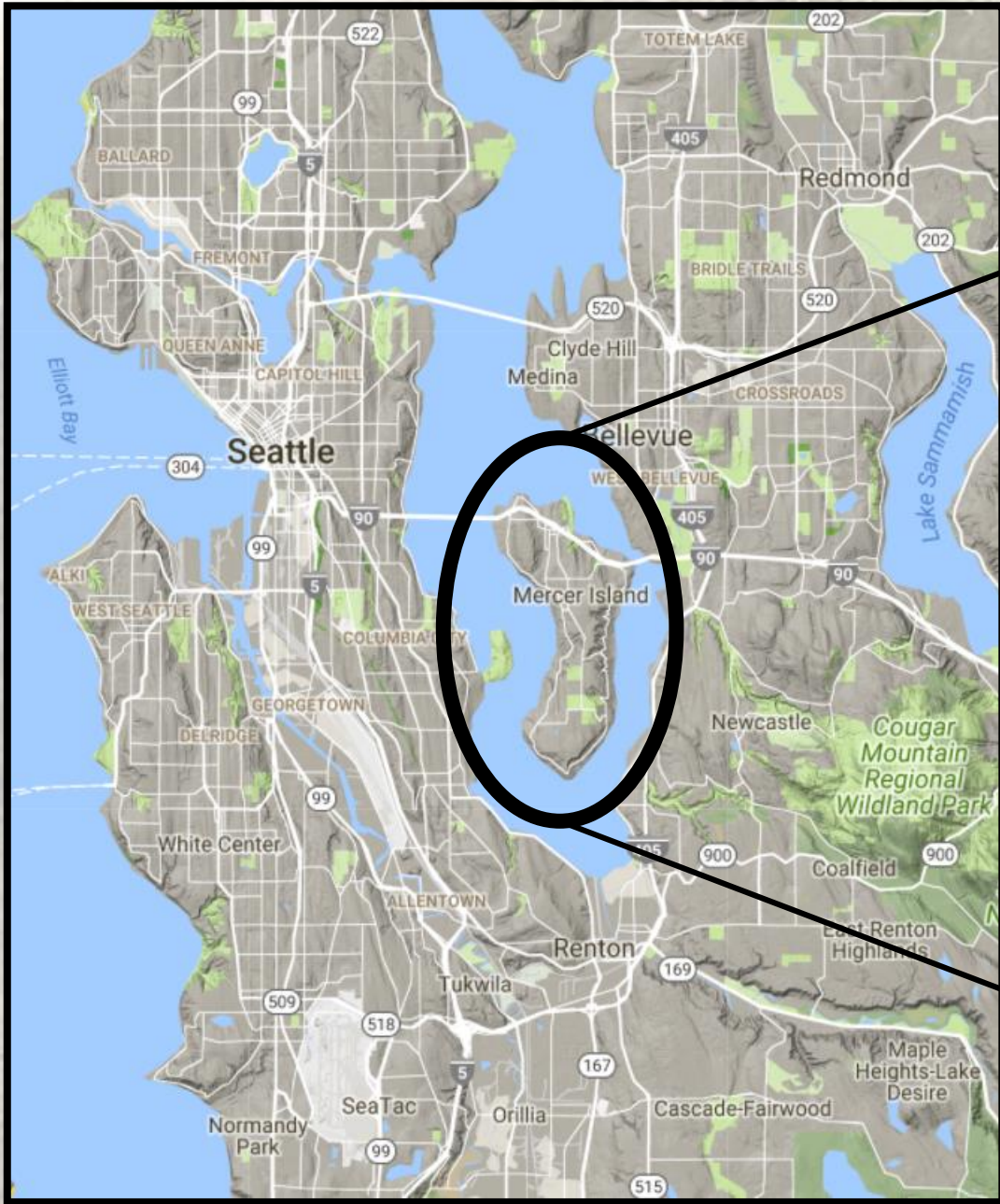
for pathogens

of desired plant

A photograph of a soil profile showing different layers of soil. The top layer is dark brown, followed by a lighter brown layer, and then a darker, more textured layer. The text "Soil management" is overlaid in white, bold, sans-serif font across the middle of the image.

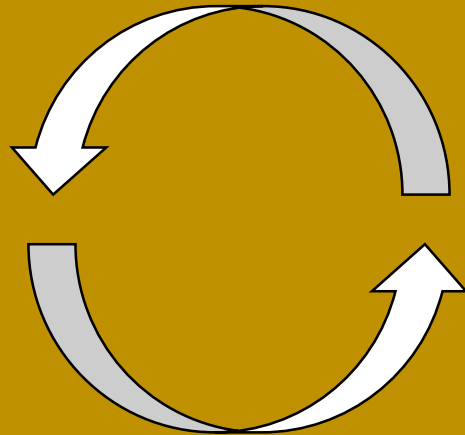
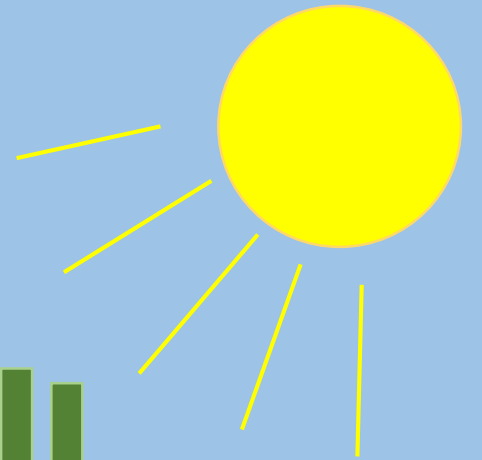
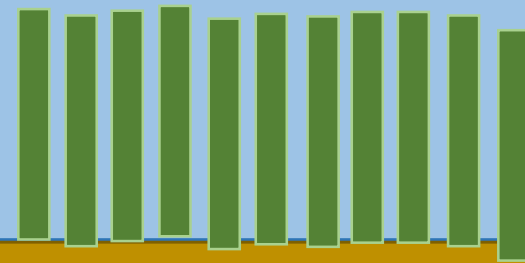
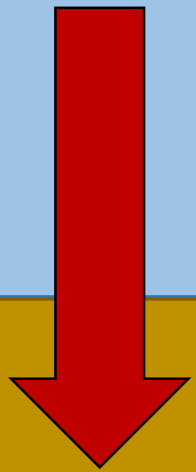
Soil management

By Chris Yeates, CC BY-SA 2.0, <https://commons.wikimedia.org/w/index.php?curid=9193263>



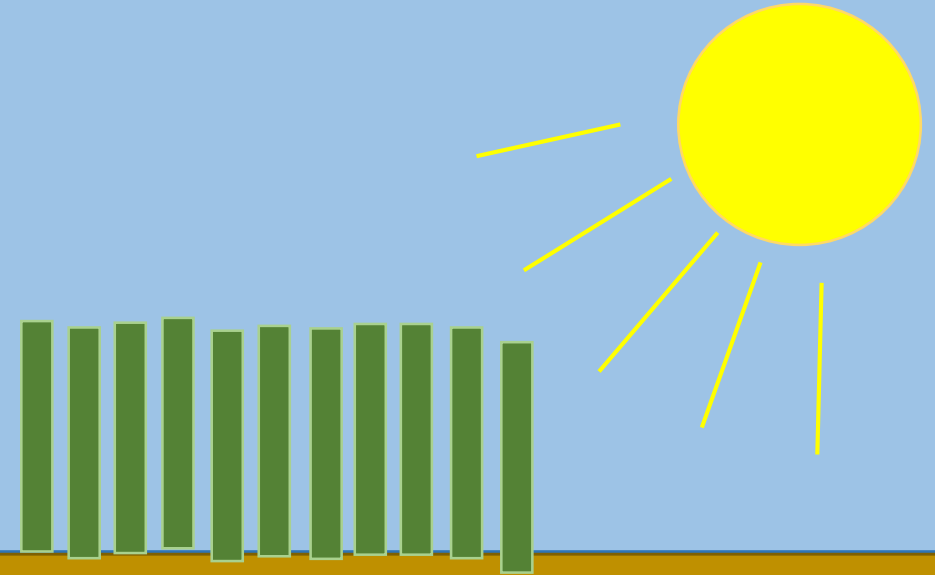
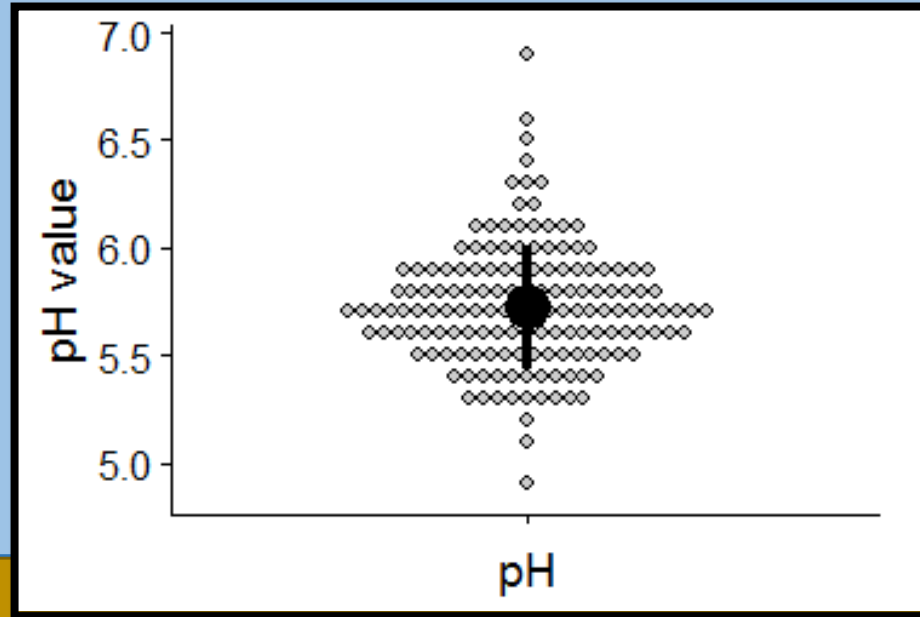
Ecological perspective

Inputs (e.g. irrigation, nutrients, heat ...)



Soil chemical properties

pH



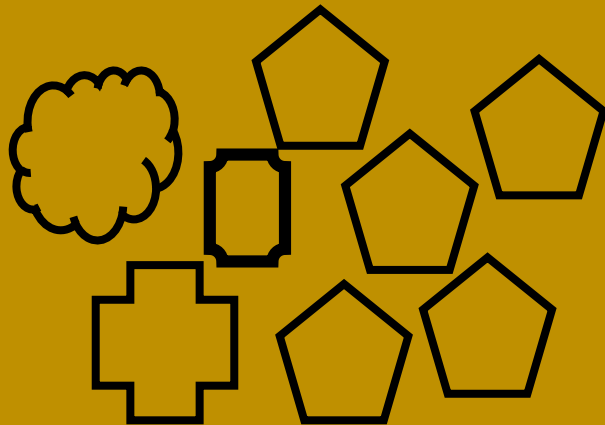
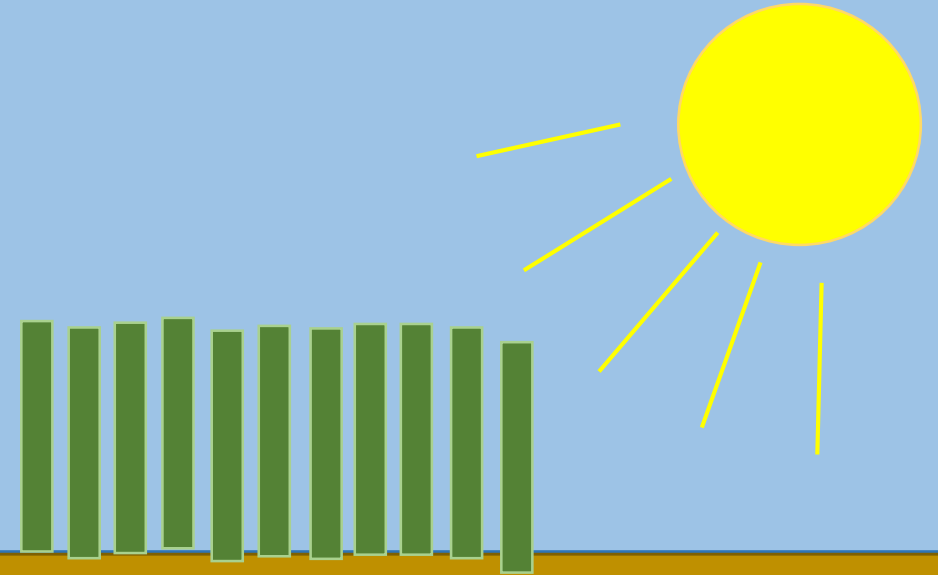
Nutrient availability:

- Nitrogen (N), phosphorus (P), potassium (K)
- Calcium (Ca), iron (Fe), Magnesium (Mg)

Soil physical properties

Structure

Texture



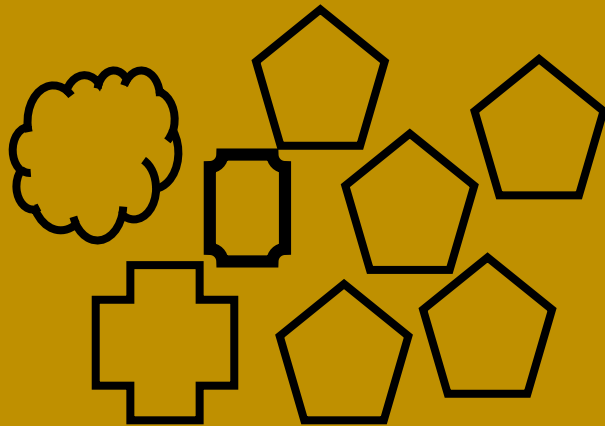
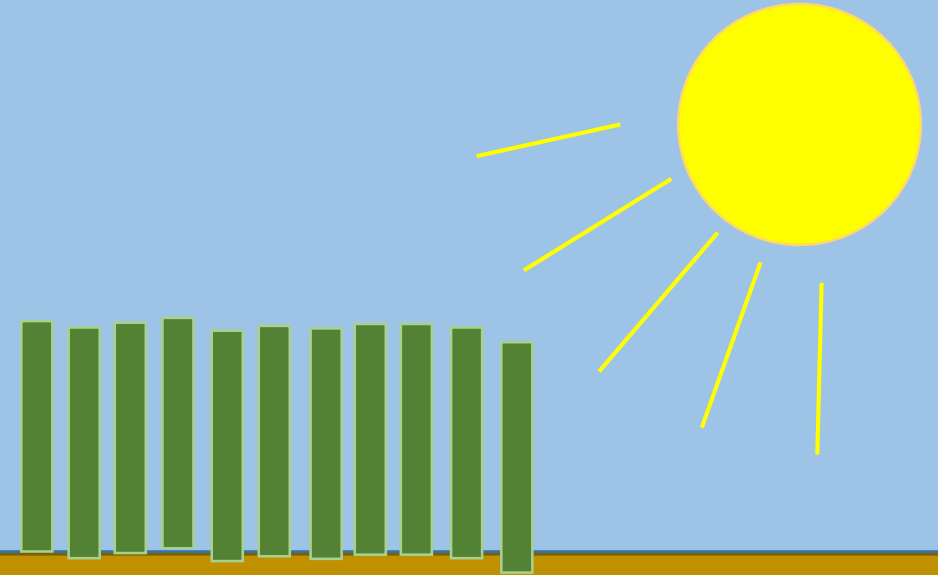
Percent:

- Sand
- Silt
- Clay

Soil physical properties

Structure

Texture



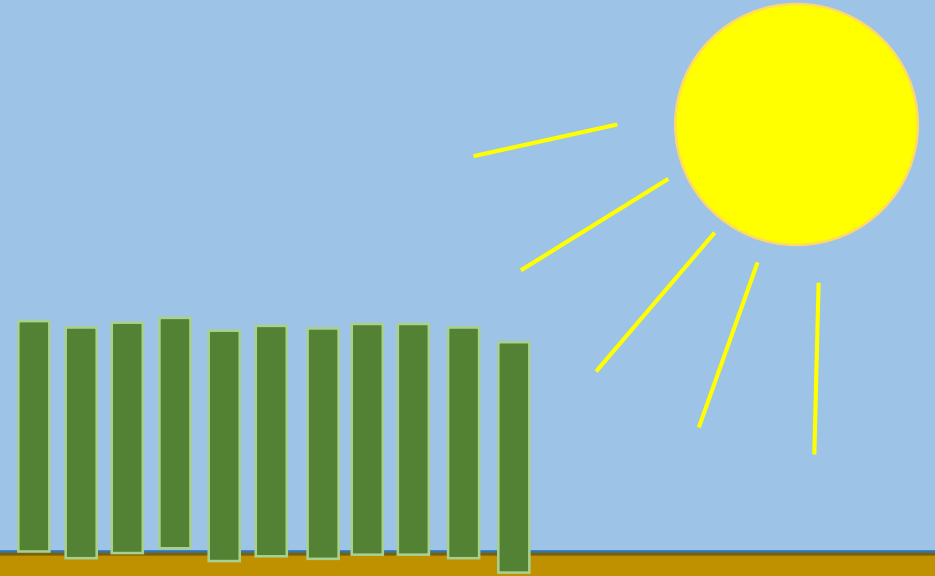
Percent:

- Sand
- Silt
- Clay

Irrigation and soil
moisture

Soil environment

- Chemical
- Physical
- Biological

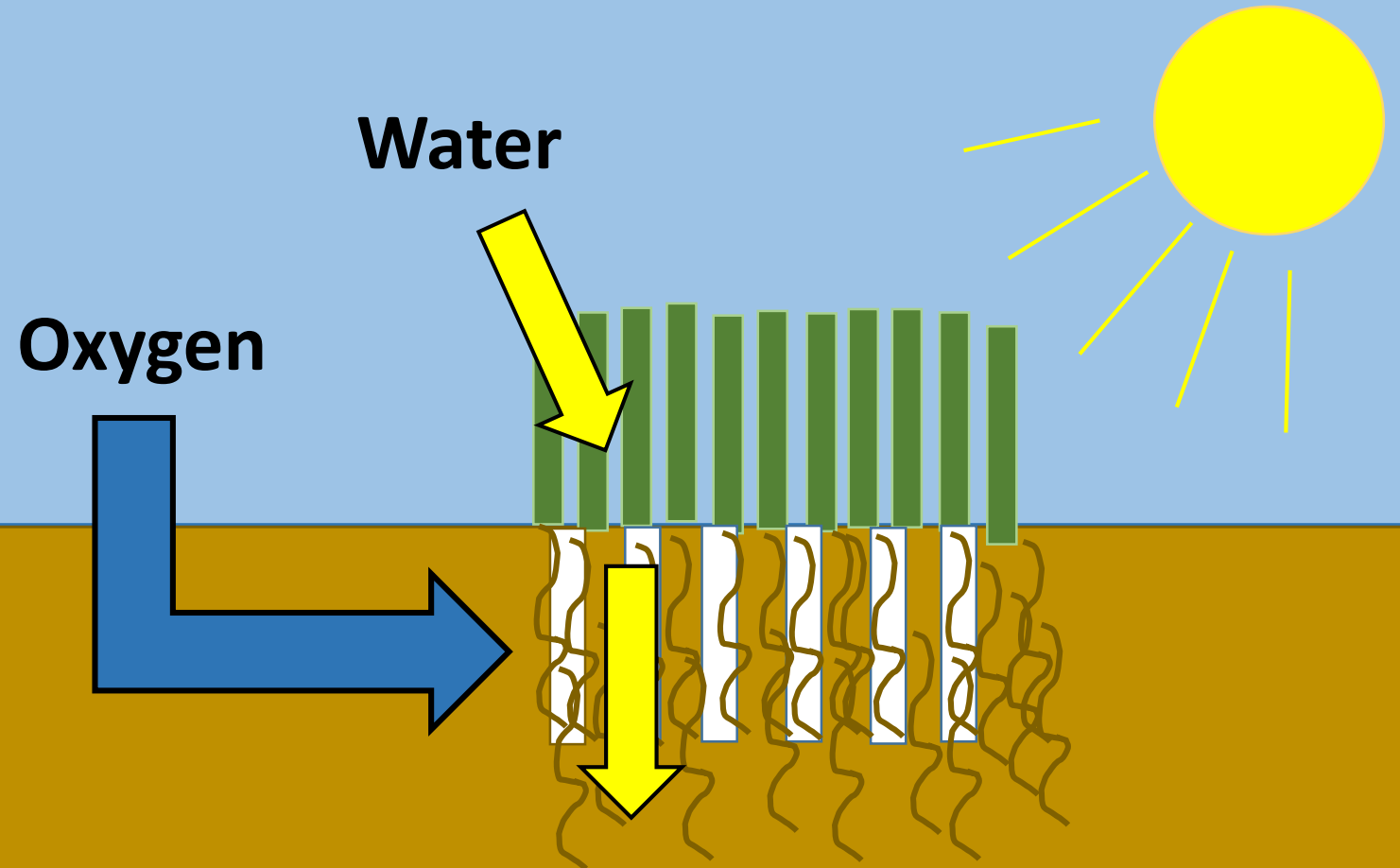


Soil cultivation

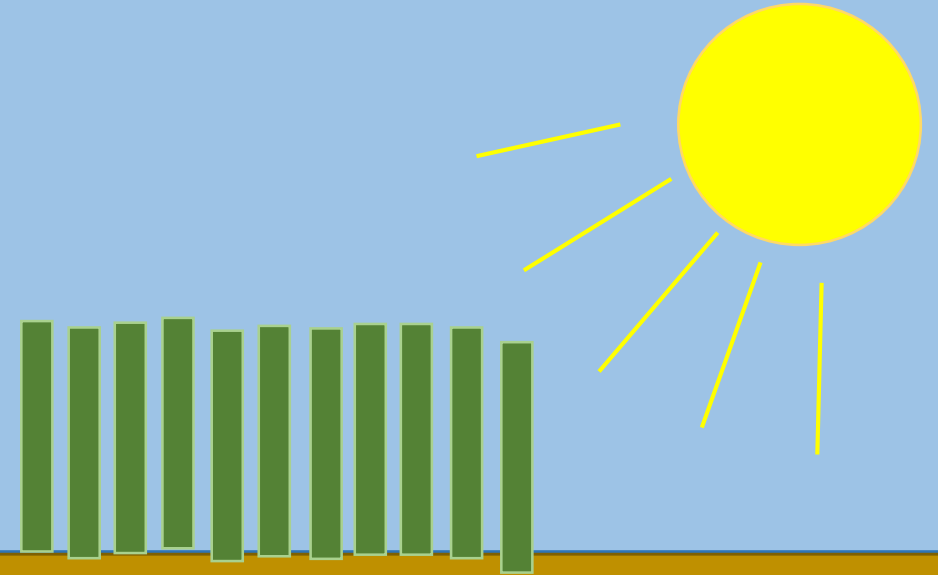
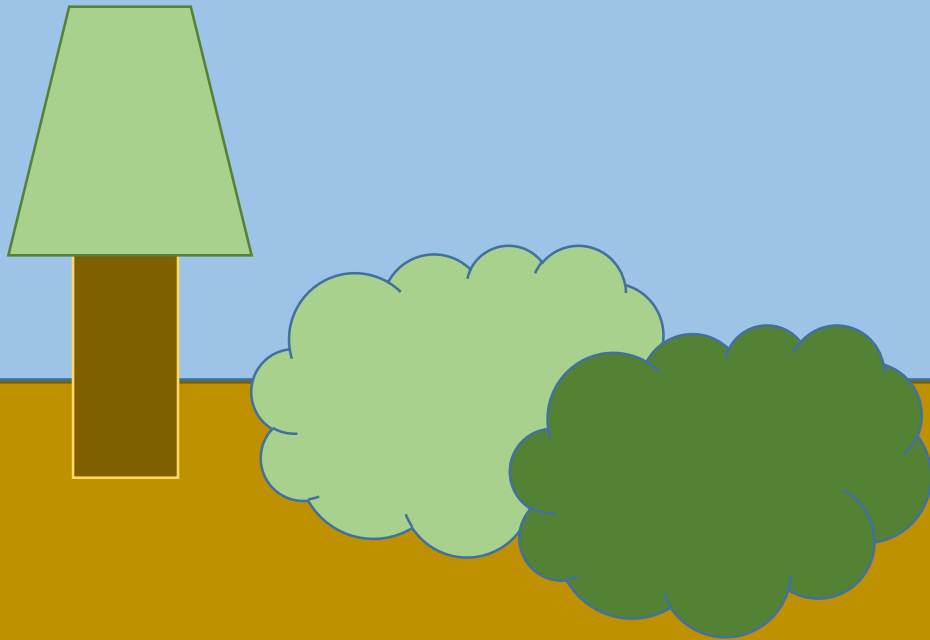
- Aerification
- De-thatch



Soil environment



Environment



More diversity = more functionality

Simplify

Baseline

- **Soil sample (pH, nutrients)**
- **Texture**

Records

- **Year to year comparisons**

Approach

- **Group site by soil conditions**
- **Group sites by environmental conditions**
- **Group problematic site together in a management strategy**

Be your own scientist:

- **If and when you have problems, go back to records**
- **Then contact the county agent, or university personnel**



Thank you! Questions?

nathan.stacey@wsu.edu