2. E4 Site Evaluation

Site Evaluation

Introduction.

Site evaluation the process of inspecting and assessing a property to determine management needs

Understand the

- **Site** a property or part of a property where turf and ornamental practices are applied.
- Site size.
- Maintenance history.
- **Cultural practices** methods of controlling a plant and the environment that a plant grows in e.g., tilling watering, pruning, fertilizing, mowing.
- Adjacent properties.
- Customer's or supervisor's expectations.

Site Evaluation

Introduction.

- Create a standard for recording the site evaluation.

- Many of your observations may relate to plant health.

- On each pesticide application, update the site evaluation as necessary based on your observations.

Site Evaluation

Abiotic stresses non-living plant stresses caused by unfavorable growing conditions e.g., frost, drought .

Plant symptoms abnormal conditions of plants that indicate a disease or disorder.

Site Evaluation

Inspect and Document the Site

Gather information from customer and document findings.

- **Determine the property boundaries from the customer, property records, and online sources.**
- **Boundaries are needed not only to determine site size but to make sure pesticide applications are not going offsite.**

Site Evaluation

Inspect and Document the Site

Concerns and expectations. Talk to customers and/or supervisors and find expectations.

- **Some customers would prefer fewer pesticide applications.**
- **Some people are more tolerant of weeds**
- **The input for different expectations varies ,higher input landscape requires more labor, materials, and money.**
- **Expectations differ for different areas of the property.**

Site Evaluation

Inspect and Document the Site

Existence of pollinator gardens.

- **Verify if there are butterfly or bee gardens on the property.**

Site Evaluation

Inspect and Document the Site

Existence of pollinator gardens.

Take precautions around pollinator areas—herbicide applications may be harmful to bees and other pollinators.

Site Evaluation

Walk the Site and Document Findings. Outdoor sites.

Area. Find the area of the site from

- **Often the engineering department of government properties will have mapping capability.**
- **Some county government offices have mapping programs.**
- **Contractors often can purchase mapping programs.**
- **Manual method using a measurement wheel.**

Site Evaluation

Walk the Site and Document Findings. Outdoor sites.

Area Plants and turfgrass—inventory existing plants

- **Identify species of turfgrass since requirements will differ.**
- **Document noxious weeds or other invasive species.**

Site Evaluation

Location effects influences of site conditions such as exposure, soil type, and moisture, on plants.

- Slope. Will the property be prone to runoff and erosion? Are there steep hills or access issues that would limit equipment operation?
- Aspect. What direction do various areas on the property face? Aspect influences wind patterns and sunlight.
- Irrigation. Is there an irrigation system or is the site watered regularly? Are the irrigation heads correct. Does the system water the turf and not hard surfaces?

Short Summary

Search customer records and property records for site information including boundaries.

Survey plant health.

Determine the light exposure.

Identify the species of turf grass present.

Quick Questions

What are abiotic stressors

Non-lining plant conditions caused be unfavorable weather.

How will the slope of the site influence management?

Runoff or drainage

What are plant symptoms?

Abnormal conditions of plants that indicate a disease or disorder.

Site Evaluation

Walk the Site and Document Findings.

Outdoor sites.

- **Drainage. How does the site drain? Are there waterbodies e.g., ponds, streams, lakes, or wetlands nearby? Note the nearest storm drains—any spills would be washed into a surface water.**

- **Light. What is the light exposure? full sun, partial sun, or shade. Densely shaded areas will not successfully grow turfgrass and may be prone to weeds. Consider a shade-tolerant planting or mulch.**

Site Evaluation

Walk the Site and Document Findings

Outdoor sites

Soil properties. Soil probe

- **Coarse—sands loamy sands, and sandy loam.**
- **Medium—loams and silt loams.**
- **Fine clay—clay loams, silty clay loams, and silty clays.**

Soil particle sizes

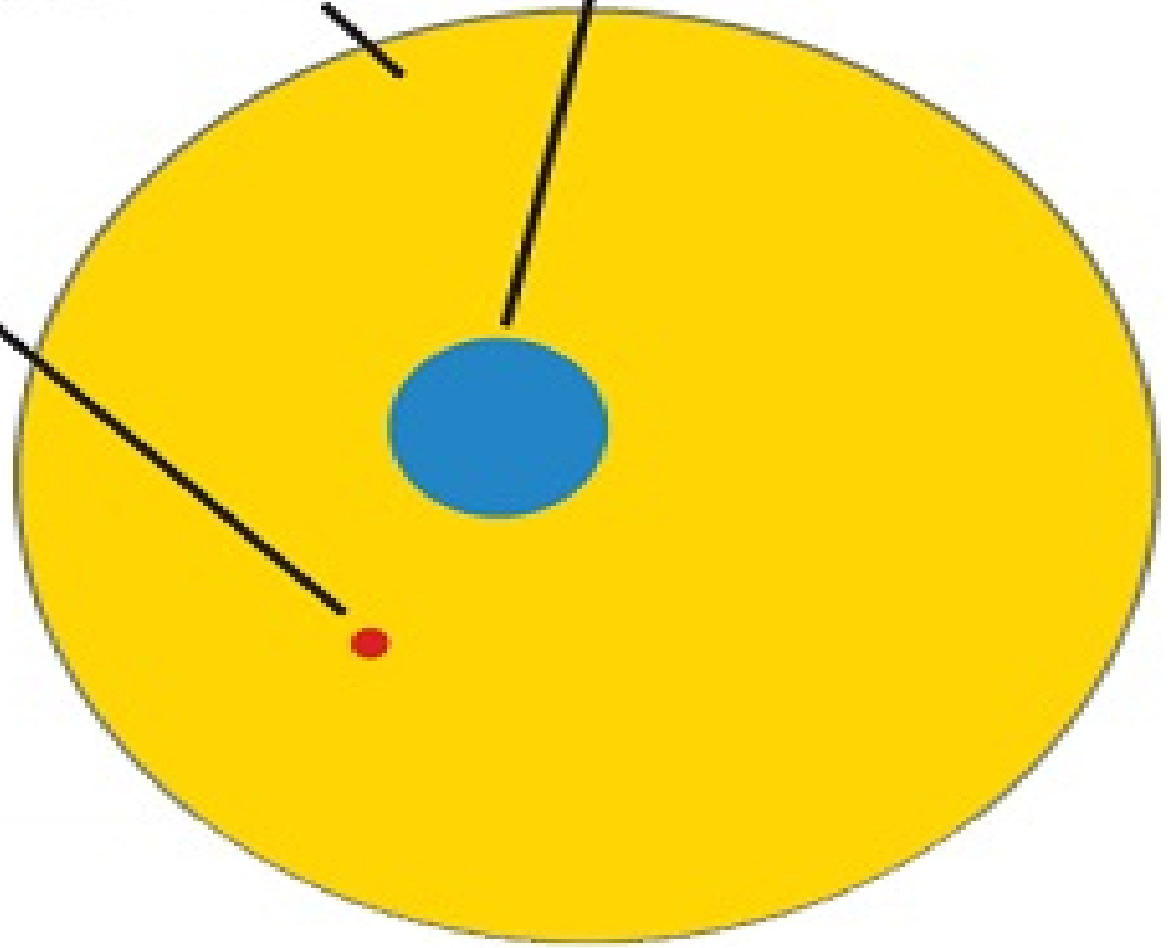
Site Evaluation

Walk the Site and Document Findings Outdoor sites. Soil properties. **Soil probe** —a tool for evaluating soil conditions.

SILT – 0.05 to 0.002 mm

SAND – 2.0 to 0.05 mm

CLAY – less than 0.002 mm



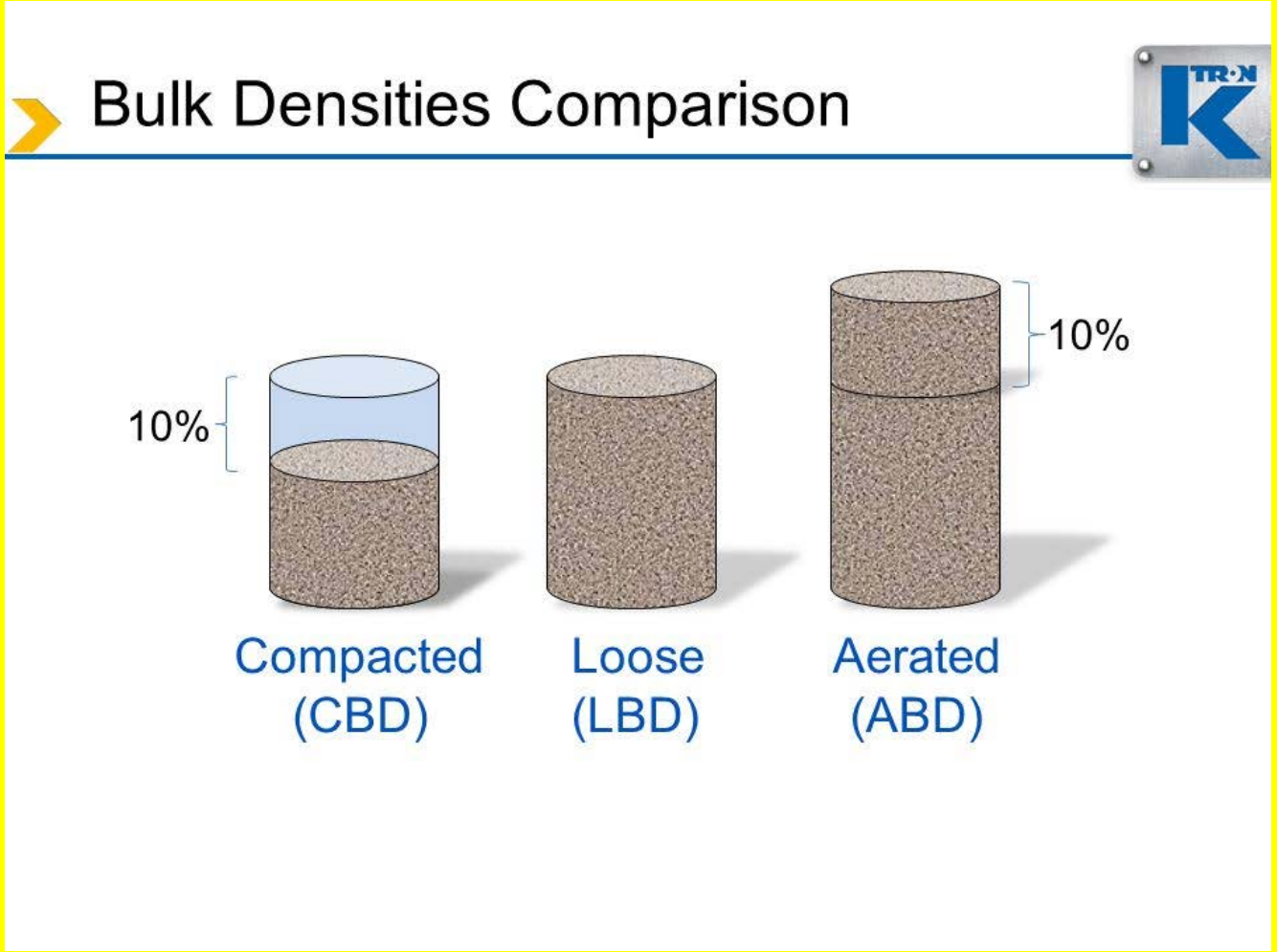
Site Evaluation

Walk the Site and Document Findings

Outdoor sites.

Soil properties.

- **Bulk density the dry weight of the soil divided by the soil volume.**



Site Evaluation

Walk the Site

Send turfgrass soil sample to the University of Minnesota Soil Testing Laboratory or to a private lab.

A soil test will provide information on

- **Soil texture**
- **Nutrient needs**
- **pH**
- **Organic matter content**

Site Evaluation

Walk the Site and Document Findings. Outdoor sites.

- Optimum soil pH 6.0 to 7.0
- Higher or lower pH will affect the availability of key plant nutrients and the activity of soil microorganisms. will also affect the soil ability to hold nutrients.
- Soils that are too acidic (low pH) or too alkaline (high pH) will affect plant growth.

Site Evaluation

Walk the Site and Document Findings. Outdoor sites.

Adjacent sites

- **Inspect adjacent site for sensitive areas e.g., a daycare center, children playing in the yard, neighbors growing flowers (pollinators), etc.**
- **If there is a neighbor on adjacent properties who has chemical sensitivities to pesticides note this in the file.**

Site Evaluation

Walk the Site and Document Findings. Outdoor sites.

Environmental and non-target concerns

Assess the site for potential contamination to ground water

- **Steep slopes**
- **Drainage ways**
- **Wetlands**
- **Streams**
- **Lakes**

Site Evaluation

Walk the Site and Document Findings. Outdoor sites and non-target concerns

Document potential for non-target impacts

- Bee, butterfly, and other pollinator gardens.
- Bees fly up to 2 miles from the hive to gather nectar and pollen.
- Many commercial sites and townhouses have stormwater treatment ponds that are also habitat for birds, frogs and other wildlife.

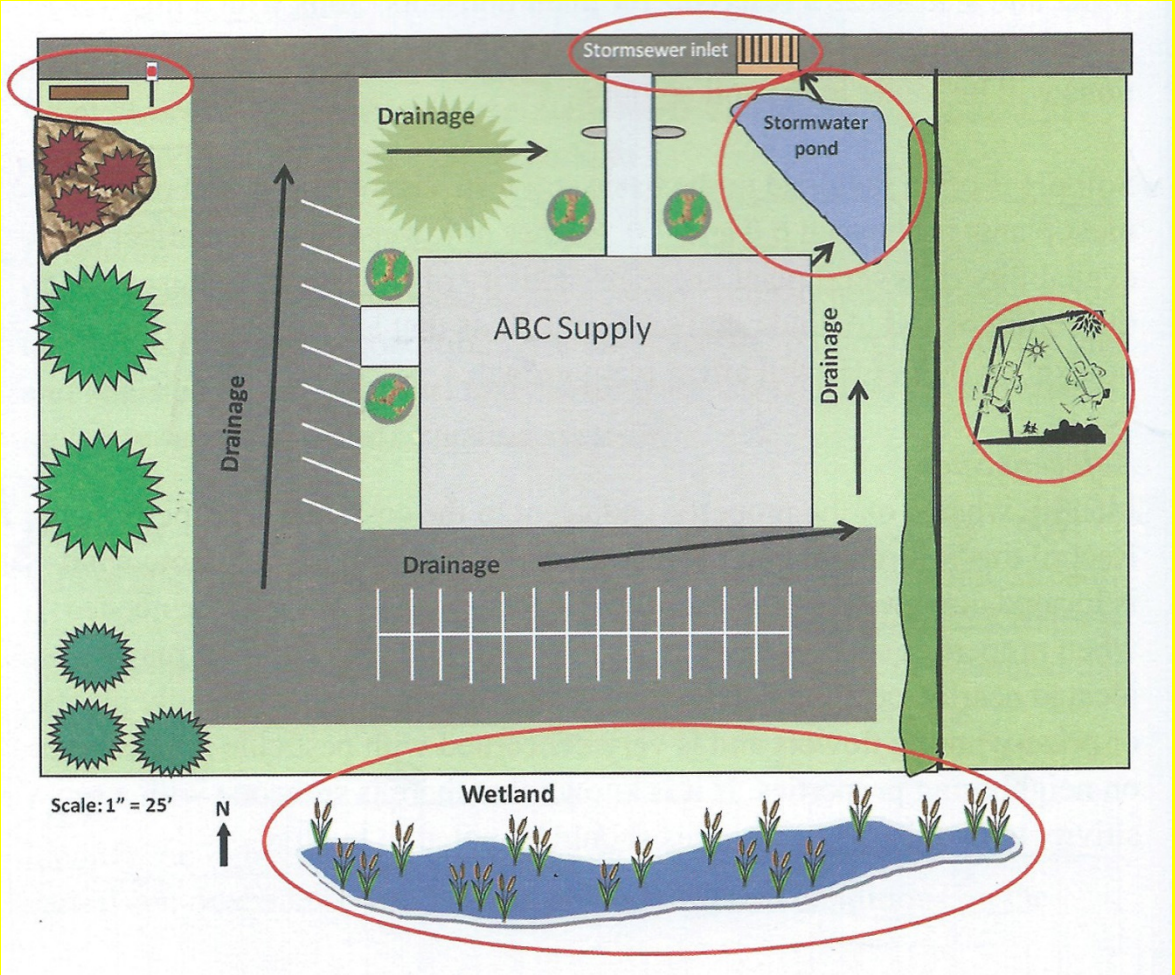
Site Evaluation

Walk the Site and Document Findings.

Outdoor sites.

Example Site contains

1. **Environmental—wetland, stormwater pond, storm sewer inlet.**
2. **Non-target—bench for bus riders, adjacent property daycare center—possibly children are present**



Category E Turf and Ornamentals Pesticide Safety Education Manual Chapter 4

Short Summary

Determine how the site drains and if the are nearby bodies of water.

Assess the site for potential contamination to ground water: steep slopes, drainage ways, wetlands, streams, lakes.

Soils that are too acidic or too alkaline will influence plant health.

Quick Questions

What will a soil test determine?

Soil texture, nutrient needs, pH. Organic matter content

How far can bees fly?

Up to two miles

What will soil pH affect?

Nutrient availability and ability to hold nutrients

Site Evaluation

Interiorscapes and greenhouses

Inventory

- Species
- Quantities
- Sizes
- Photograph anything you can’t ID

Site Evaluation

Interiorscapes and greenhouses

Light conditions

- Use a light meter measuring in foot candles (fc) to determine light levels.

- Plants in multistory buildings with a central atrium will have higher light levels for plants on the north side of the atrium.

Site Evaluation

Interiorscapes and greenhouses

- **Temperature and humidity**

- **Commercial buildings control temps between 60 and 80 °F. At higher temps plants will dry out faster. Most tropicals won't tolerate temps below 50 °F.**

Site Evaluation

Interiorscapes and greenhouses

- **Ventilation** Document where vents are located e.g. in the ceiling along the walls, in the floor. Knowing where vents are located and adjusting vents will help contain spraying to the target area.
- **Irrigation** water. Minerals in water can reduce the effectiveness of pesticide sprays. Test water for hardness. Softened water may cause excess sodium buildup in plants.
- Ensure adequate **drainage** of potted plants—avoid standing water.

Site Evaluation

Interiorscapes and greenhouses

- **Potential stressors Public areas result in unusual stressors e.g., people with beverages, children playing.**
- **Safety issues Access may require ladders. Some areas may not be appropriate for spray applications e.g., pool rooms—move plants to an appropriate area for spray application. If chemigation is going to be applied make sure anti-backflow devices are working.**
- **Insect new plants for insects or diseases-quarantine and treat in a safe area before installation.**

Site Evaluation

Document Problems, Potential Problems, and Risks

Measure and map the affected areas.

- **Document any plant problems you identified during the site assessment.**
- **Measure the affected area or inventory the affected plants (indoor plants or trees).**
- **If trees are involved, measure the DBH at 4.5 feet.**

Site Evaluation

Document Problems, Potential Problems, and Risks

Determine the possible cause of plant problems.

- **Diagnosis** The positive identification of a problem and its cause. Determine the cause and select the best management option.

- Diagnostics includes examining the plant/s and the surrounding areas and speak to property owners and others with information How was the site treated?

Site Evaluation

Document Problems, Potential Problems, and Risks

Determine the possible cause of plant problems.

Diagnosticians employ a systematic process

- **Plant knowledge**
- **Assessment using books and websites**
- **Knowledge of diagnostic techniques**
- **Open, logical mind**
- **Patience and thoroughness**

Site Evaluation

Document Problems, Potential Problems, and Risks

Identify the affected plant.

- **Understanding the appearance of a healthy plant is essential to understanding an abnormal plant.**
- **Pathogens —disease causing organisms, have a host range. Sometimes it is possible to diagnose a problem based on the host range.**
- **The host range can be broad or narrow e.g. sawfly, narrow or Japanese beetle, broad.**
- **Once you identify the problem look for information resources.**

Site Evaluation

Document Problems, Potential Problems, and Risks.

Describe the symptoms.

- **Symptoms** response or alteration of appearance due to a pest or problem.
- What types of damage? Is the problem affecting the entire pant or specific plant parts?
- Progression of the problem over time e.g., on trees, diseases often start on the lower canopy and progress. Insect problems often affect the entire plant.

Site Evaluation

Document Problems, Potential Problems, and Risks.

Describe the symptoms.

Progression of the problem over time e.g.,

- **Abiotic (non - living) disorders often follow an event like flood frost, or herbicide exposure. Talk to the property manager to determine if an event preceded the disorder.**

Site Evaluation

Document Problems, Potential Problems, and Risks.

Describe the symptoms.

Look for signs of the pest signs may include

- **Fungal spores**
- **Bacterial ooze**
- **Insect droppings i.e., frass insect excrement**
- **Exit holes**
- **Signs of tunneling**
- **Sap or resin on stem**

Short Summary

Abiotic non - living disorders often follow an event like flood frost, or herbicide exposure.

Use a light meter that measures in foot candles to determine light exposure.

Symptoms response or alteration of appearance due to a pest or problem.

Quick Questions

What are plant pathogens?

Plant disease-causing organisms

How do insect problems progress?

Insect problems often affect the entire plant

Name a pest with a narrow host range.

Sawfly

Site Evaluation

Document Problems, Potential Problems, and Risks

Points to remember.

Location of initial symptoms can be a useful diagnostic

- **Most leaf spot diseases appear in the lower canopy.**
- **Vascular wilts show up in the upper canopy—this occurs because the damaged root or blocked vascular system cannot replace the water being lost in the upper canopy.**

Site Evaluation

Document Problems, Potential Problems, and Risks

Points to remember.

- **Location of initial symptoms can be a useful diagnostic**

- **If injury shows up on external portions first, look for environmental factors e.g., air pollution, salt spray damage, cold injury, some herbicide injury, some insect or disease pests.**

Site Evaluation

Document Problems, Potential Problems, and Risks.

Examine the surrounding area and look for a pattern

- **If a variety of plants are affected the pest may have a broad host range or there is an abiotic problem.**
- **If only one type of plant is affected this variety may be particularly sensitive to an abiotic cause or that the pest has a narrow host range e.g., white pines are sensitive to air pollution.**

Consider cultural practices and other abiotic causes e.g., improper mowing height (too short) leads to thinning lawn and subsequent weed infestation, shallow irrigation leads to shallow root system

Site Evaluation

Document Problems, Potential Problems, and Risks

Most common abiotic stressors are

- **Insufficient or excess watering can lead to water stress which makes turf more susceptible to insect / disease / weed pressure.**

- **High or low temperatures**

Site Evaluation

Site conditions

- Soil type
- Light
- Exposure
- Wind
- Moisture

Site Evaluation

Document Problems, Potential Problems, and Risks.

- Soil condition. Poor soils are associated with slow growth, dieback, discolored foliage.
- pH matters—a soil test form the UofM Minnesota Soil Testing Lab can provide details on pH
- http://soiltest.cfans.umn.edu
- How well is the soil drained? Poorly drained soils favor root-rot pathogens.

Site Evaluation

Document Problems, Potential Problems, and Risks

Road salt is a stressor to turfgrass and other landscape plants especially along streets, sidewalks, and roadways.

- **On high-speed roads salt damage is most severe within 60 feet of the road.**
- **Damage to deciduous trees includes twig damage and ‘witch’s broom.’**
- **On evergreens damage symptoms include yellowing or browning of needles and twig dieback.**

Site Evaluation

Document Problems, Potential Problems, and Risks.

Road salt is a stressor to turfgrass and other landscape plants especially along streets, sidewalks, and roadways.

Salt damage to yew
www.missouribotanicalgarden.org

Site Evaluation

Document Problems, Potential Problems, and Risks

Symptoms of excess soil salt

- **Browning of leaf edges.**
- **Fewer or smaller leaves, flowers, and fruit.**

Salt damage to white pine

Site Evaluation

Use Reference Materials to Identify the Pest or Problem.

Reference materials include

- **Books**
- **Binomial plant keys**
- **UofM Extension Staff**
- **UofM Extension http://www.extension.umn.edu/garden/**
- **Plant disease Diagnostic Clinic http://pdc.umn.edu/**

Site Evaluation

Use Reference Materials to Identify the Pest or Problem.

Tips for using reference materials

- **Look for the host plant or suspected pest in the index.**
- **On the index host plant entry you will find symptoms, pests, disease, entries and further sub divisions i.e., a disease groups.**
- **Examine the reference book symptoms to help identify the problem, not just the photos.**
- **Photos of disease symptoms differ over time as the disease develops.**

Site Evaluation

Site Evaluation at time of Application

- **Weather conditions. Check the forecast. If rain is forecast the application may need to be delayed. Weather information must be recorded at the time application i.e., wind speed and direction, temperature— this is a requirement under Minnesota Law.**
- **Measuring temperature and relative humidity will also help determine if pesticide volatilization is likely to occur.**
- **When planning the application the property do not mow 3 days before the application and 2 days after the application.**

Site Evaluation

Site Evaluation at time of Application

Check the target area and adjoining properties for the presence of people and pets. Make sure they are notified and out of the area or indoors according to company policy.

Perform visual check for

- **Open windows if spraying**
- **Vehicle in way of application**
- **Pets, adults, or children in yard**
- **Neighbors present if spraying**

Site Evaluation

Site Evaluation at time of Application

- **Ventilation For interiorscapes verify where the vents are located so that you don’t spray pesticides where they can enter the ventilation system.**

Short Summary

Most leaf spot diseases appear in the lower canopy.

Vascular wilts show up in the upper canopy.

Weather conditions. Check the forecast. If rain is forecast the pesticide application may need to be delayed.

Quick Questions

What are the symptoms of salt injury

Browning of leaf edges, fewer or smaller leaves

Where can you take a sample of suspected plant disease?

UofM Plant Disease Clinic

Why do you need to record wind speed and direction, temperature at the time of a pesticide application this is a requirement under Minnesota Law.