

The background features a stylized forest scene. On the left, a large tree trunk with brown bark and a thin branch extends upwards. In the center, a light-colored tree trunk is visible. On the right, a tree with a thick brown trunk and a dense, rounded canopy of green leaves is shown. The bottom of the image is filled with a layer of green foliage and bushes. The overall color palette is soft and natural, with various shades of green and brown.

Gardening Through the Lens of Integrated Pest Management

Kait Ryan

Introduction



Hi! I'm Kait.

I am a professional horticulturalist who works in Public Garden Management.


OVERVIEW

1. What is IPM?
2. How to implement an IPM approach?
3. Commons Turf Pests
4. Common Garden Pests

A stylized illustration of a forest scene. On the left, a large tree trunk is visible. In the center, the text is displayed. On the right, another tree with a full green canopy stands. At the bottom, there is a layer of green grass and several red mushrooms with white spots.

01

What is Integrated Pest Management?

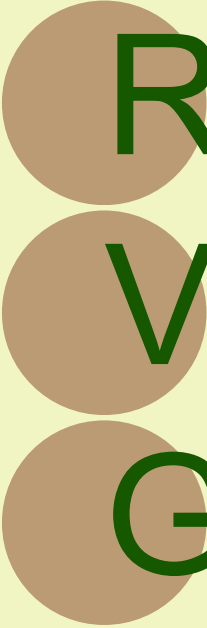


The United States Environmental Protection Agency describes Integrated Pest Management (IPM) as "an environmentally friendly, common sense approach to controlling pests..."

The approach...

“...uses current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.”

Your approach to IPM can be customized
to your...



Resources

Values

Goals

Your approach to IPM should comply to...

Local Laws

“Best Practices”

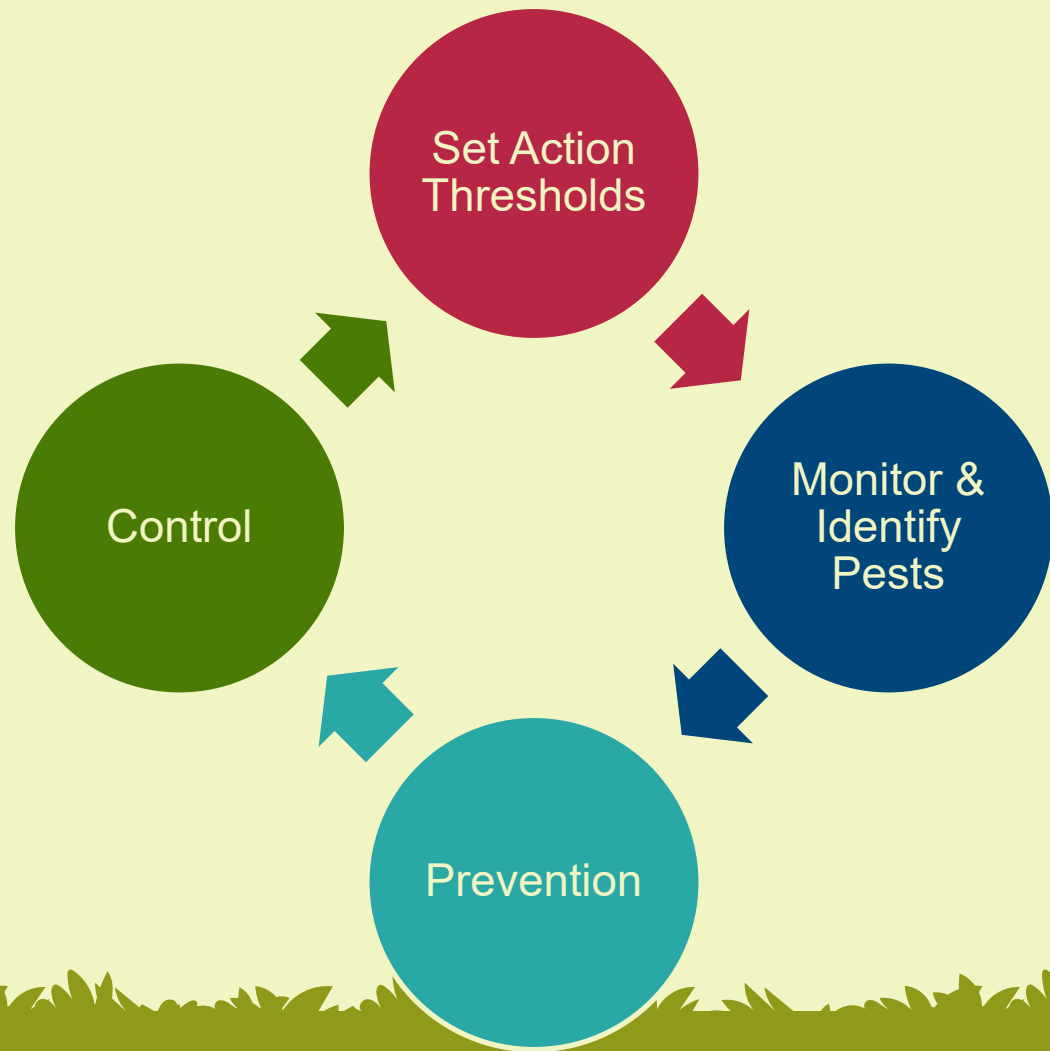
Current Research

A stylized forest illustration with trees, bushes, and mushrooms. The background is a light green color. On the left, there is a large tree trunk and a branch. On the right, there is a large tree with a full green canopy. In the foreground, there are green bushes and several red mushrooms with white spots. The text is centered in the middle of the image.

02

How do you
implement
an IPM approach?

Implementing an IPM approach is a cycle rooted in how you work.





Set Action Thresholds

**What can be tolerated
before action must occur?**

Plant Loss

Plant Damage

Pest Presence

Other Impacts



**Monitor &
Identify
Pests**

**Requires active and
passive scouting for**

Feeding Damage

Discoloration

Defoliation

Droppings/Waste

Products

Physical Pest



Prevention

**How can you prevent
damage from exceeding
your threshold?**

Growing Conditions

Plant Selection

Site Design



Control

When thresholds are exceeded, how do you control pest populations?

Cultural

Mechanical

Biological

Chemical

Cultural Control Techniques

Watering
Schedules

Pruning

Plant
Selection

Sanitation

Mulching

Mechanical Control Techniques

Pulling
Weeds

Hand
Picking
Insects

Mowing

Pruning

Biological Control Techniques

Attracting
Predatory
Insects

Introducing
Bio-Controls

Chemical Control Techniques

Organic
Pesticides

Synthetic
Pesticides

The label is the law!

A stylized forest illustration with trees, bushes, and mushrooms. The background is a light yellow-green gradient. On the left and right sides, there are large trees with brown trunks and green foliage. At the bottom, there is a row of green bushes and three small red mushrooms with white spots.

IPM is **NOT** a
linear process.

It truly must be integrated
into how you work to be
successful.

A stylized forest illustration with trees, bushes, and mushrooms. The background is a light green color. On the left, there is a large tree trunk and a branch. On the right, there is a large tree with a full green canopy. In the foreground, there are green bushes and several red mushrooms with white spots. The text is centered in the upper half of the image.

03

Common Turf Pests

The background of the slide is a light green color with a stylized forest scene. On the left and right sides, there are brown tree trunks and branches. At the bottom, there is a green grassy area with several small, pinkish-red mushrooms and some green foliage.

Turf weeds often tell us about the growing conditions at the site.

Often this is referred to as an indicator species. This is helpful to determine if cultural practices could help break the cycle.

Indicator Species: TURF WEEDS



PLANTAIN



DANDELION



PROSTRATE
KNOTWEED



GROUND IVY

COMPACTION

COMPACTION

Cultural Controls

- Limit sources of compaction
- Aeration

Mechanical Controls

- Hand pulling
- Mowing off flowerheads
- Smothering

Biological Controls

- No major options

Chemical Controls

- Targeted herbicide application

Indicator Species: TURF WEEDS



BIRDSFOOT
TREFOIL



BLACK
MEDIC



WHITE
CLOVER

LOW NITROGEN

LOW NITROGEN

Cultural Controls

- Fertilization

Mechanical Controls

- Hand pulling
- Smothering

Biological Controls

- No major options

Chemical Controls

- Targeted herbicide application

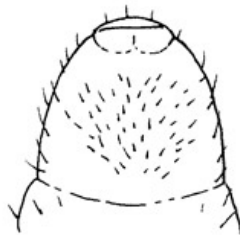
WHITE GRUBS

There are multiple species of beetle that start their life as “white grubs”.

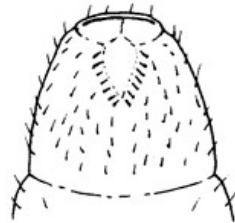
Different species thrive in different conditions.



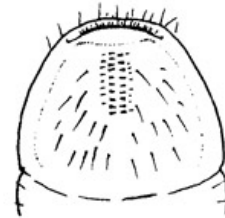
WHITE GRUBS



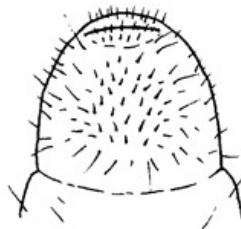
**Black turfgrass
ateniis**



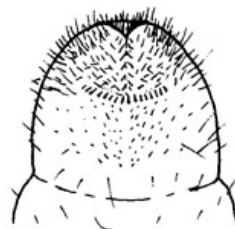
Aphodius spp.



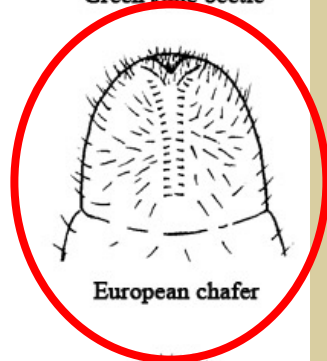
Green June beetle



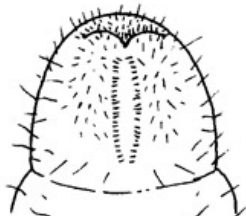
**Northern-southern
masked chafer**



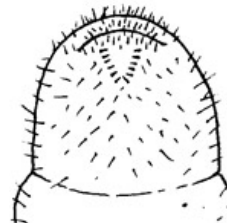
**Asiatic garden
beetle**



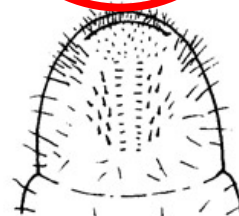
European chafer



May or June beetle



Japanese beetle



Oriental beetle.

WHITE GRUBS

Cultural Controls

- Irrigation
- Plant Selection

Mechanical Controls

- No major options

Biological Controls

- *Bacillus thuringiensis galleriae* (Btg)

Chemical Controls

- Acelepryn or other insecticides

WHITE GRUBS

Chemical Controls

Acelepryn is a trade name for a newer insecticide that that is marketed as having reduced non-target impacts to bees.

While this is an improvement upon what was available prior, it is not a “perfect product”.



COMPACTION



GRUBS



WHAT'S THE PROBLEM?

The background is a stylized illustration of a forest. On the left, a large tree trunk is visible. On the right, a tree with a full green canopy stands. The ground is covered with green grass and bushes. In the bottom right corner, there are several red mushrooms with white spots. The overall color palette is soft and natural, with greens, browns, and a pale yellow background.

03

Common Garden Pests

INSECTS



ANIMALS

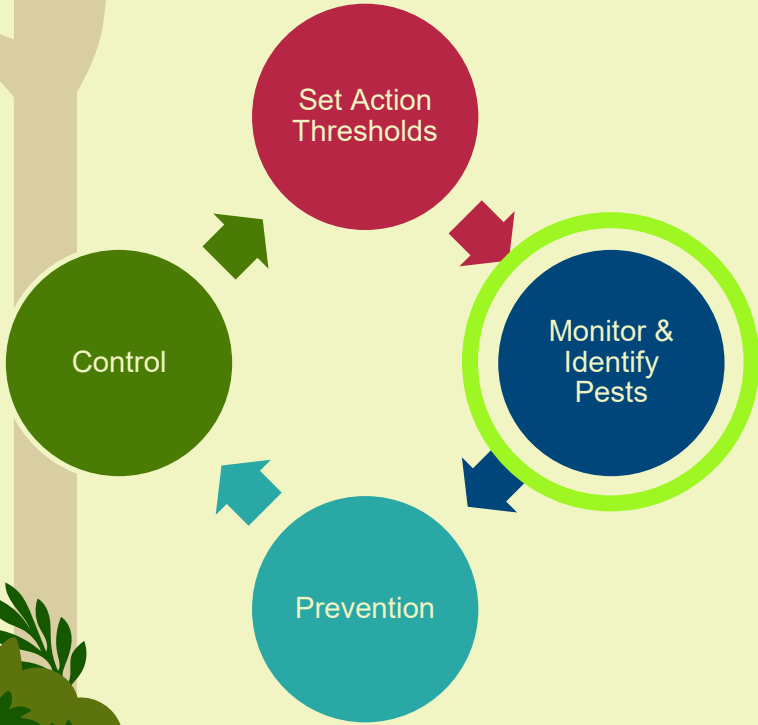


MONITORING & IDENTIFICATION

Before you can react, you need to know what you are reacting to...

What are you seeing?

- Damaged foliage
- Missing flowers or flower buds
- Discoloration
- Droppings
- Actual insects or animals



MONITORING & IDENTIFICATION

Before you can react, you need to know what you are reacting to...

What are you seeing?

What plant is impacted?

What time of the year is it?



MONITORING & IDENTIFICATION

Before you can react, you need to know what you are reacting to...

What are you seeing?

What plant is impacted?

What time of the year is it?



Japanese Beetles



PROS?



CONS?



CULTURAL CONTROLS

Japanese Beetles



PROS?

CONS?

MECHANICAL CONTROLS

Japanese Beetles



We are seeing an emerging biological control for Japanese beetles establishing itself in the Twin Cities.

This biological control is a parasitic insect that targets adult Japanese beetles to complete its lifecycle.

BIOLOGICAL CONTROLS

Japanese Beetles



I want it. I need it.
Where do I get one?

You need to need to
create a sustainable
habitat for them.

BIOLOGICAL CONTROLS

JAPANESE BEETLES



Cultural Controls • Plant Selection

Mechanical Controls • Hand picking adults

Biological Controls • Winsome fly

Chemical Controls • Targeted insecticide applications

FOURLINED PLANT BUG



Cultural Controls

- Fall Clean Up

Mechanical Controls

- Hand picking adults

Biological Controls

- No major options

Chemical Controls

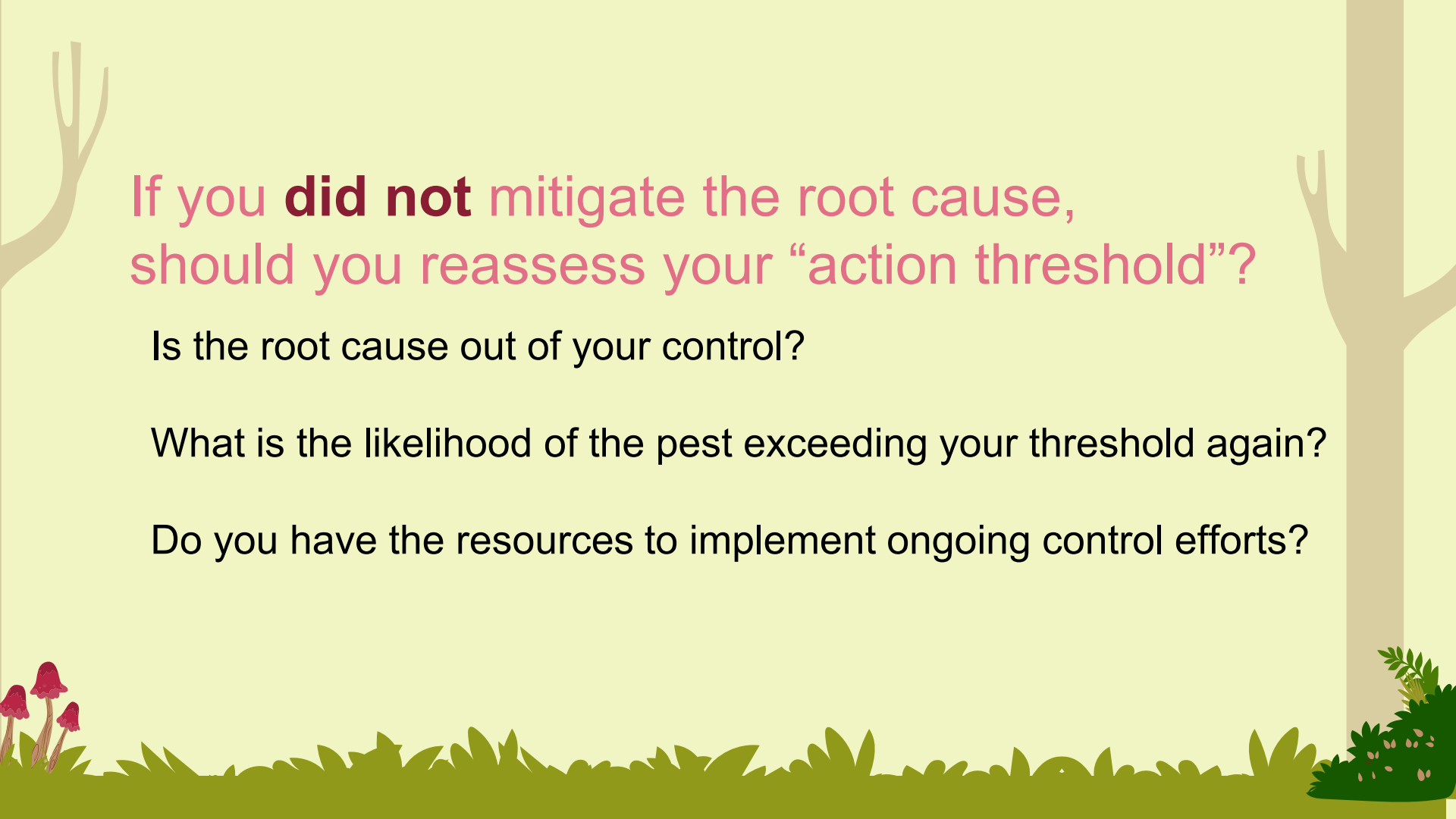
- Targeted insecticide applications



You controlled the pest population.

What's next?






If you **did not** mitigate the root cause,
should you reassess your “action threshold”?

Is the root cause out of your control?

What is the likelihood of the pest exceeding your threshold again?

Do you have the resources to implement ongoing control efforts?

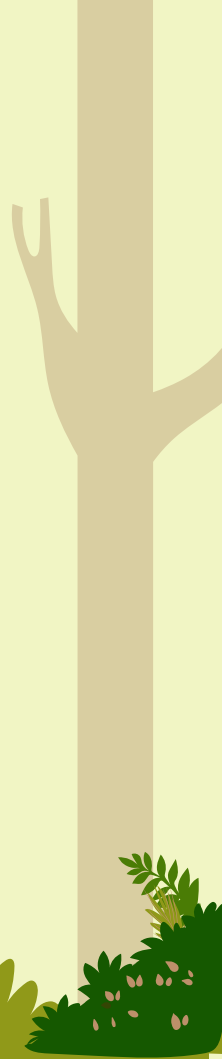


If you **did** mitigate the root cause,
what routines need to be established to
maintain?

Scouting routines?

Fertilization routines?

Pruning routines?





**Great gardeners
are great
detectives.**

**Pests always leave
us clues.**



Thanks!

Do you have any questions?

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