



Insecticides & Fungicides

JACY MACCHIA

FEBRUARY 2022 MEETING

Overview

- ▶ Personal Background
- ▶ Insecticide & Fungicide Basics
- ▶ Systemic vs Topical
- ▶ Preventative vs Curative
- ▶ Read and Follow the Label
- ▶ Other Considerations

Personal Background

We have >300 houseplants that spend the summer outside.

- ▶ I have ~10 that I've had for 10-15 years.
- ▶ We started training bonsai 7 years ago and currently have ~70 of various types, sizes and stages.

I'm a Chemist at Corteva Agriscience

- ▶ 17 years with the company, 10 of them focused on pesticide development
- ▶ Current roles
 - ▶ Leading research and development of new products for the Urban Pest portfolio and supporting our 6 industry leading products
 - ▶ External Technology and Partnership Scout: identifying and vetting potential collaborators, building and maintaining external relationships
 - ▶ Leading 2 organization-wide safety programs



Pesticide Basics

Pesticidal Active Ingredient (AI) vs Pesticide Product

- ▶ The active ingredients are what actually do the job
- ▶ Everything else in the formulated product is there to make the active easier to use and apply



Insecticide Basics

- ▶ There are 34 classes of insecticides, based on their mode of action
 - ▶ All insecticides don't work the same way.
 - ▶ No insecticide is effective on all insects.
 - ▶ An insect will be susceptible to multiple insecticides, but not all of them.
- ▶ Some insecticides are active based on contact, while others need to be consumed in order to be effective

Fungicide Basics

- ▶ There are 7 classes of fungicides, based on their mode of action
 - ▶ All fungicides don't work the same way.
 - ▶ A new mode of action has not been commercialized in over 30 years.
 - ▶ A majority of the products on the market for at-home use contain Triazoles or Strobilins.
- ▶ Fungicides need to be on or near the leaf surface to be effective.
- ▶ It generally takes at least 3x more fungicide to eliminate a fungal infection than needed to prevent it from getting established.

Topical vs Systemic Treatments

- ▶ Topical treatments are applied to the surface of the plant and remain on the surface
 - ▶ Can and will be washed away by rain or watering
 - ▶ Will degrade over time (UV exposure, microbial degradation, etc)
- ▶ Systemic pesticides can be taken up by the plant
 - ▶ Soil application taken up by the roots
 - ▶ Absorbance through the leaf cuticle from foliar applications
 - ▶ The soil microbiome will degrade/metabolize the active ingredient
 - ▶ The plant will metabolize the active ingredient

Preventative vs Curative Treatments

Preventative Treatments are done as regular maintenance when there is not a known pest pressure.

Benefit: Maintaining an efficacious level of actives in your plants can prevent infestations from occurring and cause the infestations that do occur to be less severe

Approach: Consider alternating between 2-3 products that contain different actives to help protect against a broader spectrum of pests

Preventative vs Curative Treatments

Curative Treatments are done when you know that pests are present.

- ▶ Step 1: Identify the pest.
 - ▶ What insect is it?
 - ▶ Is there really a fungal infection or is what you are seeing a symptom of over/under watering, a nutrient deficiency, hard water scale, etc?
- ▶ Step 2: Determine if a foliar or soil treatment is more appropriate.
- ▶ Step 3: Find a product that will eliminate the pest and can be applied how you want to apply it.

Common insect pests: scale, aphids, thrips, mealy bugs, spider mites, whitefly, stinkbugs & fungus gnats

Read and Follow the Label

- ▶ Dilution and Use Rate
 - ▶ If you under apply the pesticide will not be as effective.
 - ▶ Exposing pests to non-efficacious doses of pesticides contributes to developing resistance. These are the same pests and chemicals used in agriculture. Don't let your hobby make it harder for farmers to feed us.
- ▶ Phytotoxicity
 - ▶ Over applying some pesticides can harm or kill your plant.

Other Considerations

- ▶ Apply products when it is not going to rain.
- ▶ Wear personal protective equipment (PPE): disposable gloves and safety glasses.
- ▶ Wash your hands and any exposed body part with soap immediately after application.
- ▶ If you have a food producing garden, or a native garden, you will want to do your insecticide applications in an area where sprays cannot drift to these gardens and water runoff will not be taken up by those plants
- ▶ Try to keep children and pets out of the application area until it has dried
- ▶ Some insecticides can be harmful to aquatic life, so be mindful of natural and man-made waterways

Fungus Gnats

- ▶ Generally, a sign that your soil mix is overly moist for extended periods of time (depending on the plant, this may be ok)
- ▶ The flying gnats themselves won't damage your plants
- ▶ The larvae feed off the roots, which weakens the plant, but these damaged roots are susceptible to fungal infection, often leading to root rot
- ▶ 2 pronged approach: sticky traps to catch the adults and keep them from breeding + apply mosquito bits or an insecticidal soap to the soil to kill the larvae ... it will typically take about 3 lifecycles/generations to completely remedy the infestation





Plant Nutrients and Fertilization Mechanics

MARCH 2022 MEETING