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... responsible solutions.



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ORGANIC CONTROL FOR HOUSEPLANT PESTS

TAKE A CLOSER LOOK

- Check upper and lower leaf surfaces and along the stems
- Review the growing conditions
 - Now and in recent past
 - Look for any changes
 - Make needed adjustments to encourage healthy and attractive growth
- Tips for general houseplant care
 - **On Demand Webinars**
 - ✦ *Improve Your Indoor Environment with Houseplants - Tips for Indoor Gardening Success*
 - ✦ *Low Maintenance Houseplants for Low Light Situations*
- Abiotic disorders
 - These are due to a plant's response to the environment - not caused by insect or disease organism
- Common symptoms and possible causes:

YELLOW LEAVES

• **Yellow, Brown and Wilted Leaves on Houseplants**

- Watering Issues
 - **Knowing When to Water Houseplants**
 - Usually indicates watering too often
 - Under watering is usually accompanied by brown, crispy leaf edges
 - Try **Wild Valley Wool Pellets** to help reduce watering frequency and risk of overwatering
- Fertilization
 - **Fertilizing Houseplants**
 - Insufficient fertilizing can cause yellowing and stunted growth
 - ✦ Different nutrient deficiencies result in different parts of the plant being affected (see list below)
 - Excess fertilization is usually accompanied by crispy brown leaves
- Potbound
 - **Transplanting Houseplants**
 - Insufficient soil to retain the moisture and nutrients plants need to thrive
 - ✦ Other clues:
 - ▶ Water runs through the soil and out drainage holes
 - ▶ Growth is stunted
 - ▶ Roots fill the container and encircle the root ball

Summit Responsible Solutions

Protecting you, and the environment we live in.

Summit Mosquito Dunks® and Mosquito Bits® are America's favorite biological mosquito controls because they kill mosquitoes before they become biting, disease-spreading adults. The active ingredient is *Bti* (*Bacillus thuringiensis israelensis*), a bacterium that's deadly to mosquito larvae but harmless to other living things.

Summit® Year-Round® Spray Oil is an organic, environmentally responsible way to kill insect pests on even the most sensitive plants. Summit® Year-Round® Spray Oil has no odor, and it can be used on garden plants and fruit trees right up to the day of harvest. Use it to kill insects on indoor and outdoor plants.

Learn More



UNIQUE PATTERNS OF DISCOLORATION

- Nutrient deficiencies
 - Repot if needed - adding fresh potting mix adds nutrients
 - Fertilize if needed
 - ◆ Use a houseplant fertilizer
 - ▶ Most contain micronutrients
 - ◆ Topdress with compost - contains micronutrients
 - ◆ Coffee grounds, but don't overdo it
 - ▶ **Recycling Coffee Grounds**
 - ▶ Only slightly acidic (@ 6.5pH)
 - ▶ Contain 2% nitrogen, .06% phosphorus and .6% potassium
 - ▶ Also contain calcium, magnesium, boron, copper, iron and zinc
 - Minor nutrients used in smaller quantities by the plant - fine line between amount that is toxic or deficient
 - ▶ **Plants with Perk**
 - Nutrient deficiency symptoms - often mimic other abiotic disorders
 - ◆ *Solution is generally the same - evaluate watering and other growing conditions and repot if needed or apply houseplant fertilizer or compost*
 - ▶ Nitrogen
 - General yellowing and lack of vigor
 - ▶ Phosphorus
 - Older leaves turning reddish-purple
 - Smaller leaves
 - ▶ Potassium
 - Yellowing of leaf edges, tips or between veins
 - ▶ Calcium
 - Stem tip death
 - Yellowing, browning then falling - starts on older leaves
 - ▶ Sulfur
 - Younger leaves turn yellow
 - ▶ Magnesium
 - Yellowing between veins on older leaves
 - ▶ Iron
 - New leaves yellow between veins, veins remain green
 - Most common on acid-loving plants, like gardenias



About Melinda

Nationally known gardening expert, TV/radio host, author & columnist Melinda Myers has over 30 years of horticulture experience and has written over 20 gardening books, including *Can't Miss Small Space Gardening*, the *Midwest Gardener's Handbook*, and *Jackson and Perkins' Beautiful Roses Made Easy*. She hosts the nationally-syndicated "Melinda's Garden Moment" program airing on over 115 TV and radio stations throughout the U.S. Melinda also hosts the internationally distributed *Great Courses "How to Grow Anything"* DVD series, including the latest *Food Gardening for Everyone* DVD set. She is a columnist and contributing editor for *Birds & Blooms* magazine, writes the twice monthly "Gardeners' Questions" newspaper column and a nationally-distributed gardening column. She appears regularly as a guest expert on national and local television and radio shows.

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melindamyers.com

- ▶ Zinc
 - ◉ Small leaves and brown spots
- ▶ Manganese
 - ◉ Similar to iron deficiency - leaves not as yellow
- ▶ Boron
 - ◉ New leaves deformed - terminal (tip) bud dead
- ▶ Copper
 - ◉ New shoots die
 - ◉ Tiny leaves are deformed and yellow at the tip

YELLOWING OF THE WHOLE PLANT

- Too little light - check for other clues
 - Plants leaning to light source
 - Overall stunted growth
 - Longer than normal space between leaves (internodes)
- Too little fertilizer
 - Stunted growth - smaller leaves

BROWN LEAF TIPS AND EDGES (MARGINS)

- Watering and fertilizer issues
 - **Caring for Drought Stressed Houseplants**
- Fluoride and chlorine damage
 - Common on peace lily, dracaena, Ti, spider plant and prayer plants
 - **Fluoride Can Damage Plants**
 - ✦ Keep soil slightly more moist than usual
 - ✦ Use rainwater, melted snow free of deicing salt, distilled water
 - ✦ Chlorine will evaporate if placed in container with large opening for several days
 - ▶ Fluoride won't evaporate
- Salt build up
 - White crusty substance around rim of the pot
 - **Managing Salt Build Up (White Crusty Substance) on Houseplant Soil**
 - Minerals in water and fertilizer build up in soil
 - ✦ Scrape off any crusty salt build up
 - ✦ Then leach these salts out of the soil
 - ▶ Water thoroughly, wait 20 minutes and repeat two more times

UPCOMING WEBINARS

February 10th

*Getting Started Growing
Vegetable & Flower
Gardens*

February 17th

*Growing Nutritious and
Flavorful Edibles Indoors*

February 24th

*Low Maintenance
Gardening for Loads of
Beauty & Health Benefits*

February 27th

*Creating a Private Space:
Design Strategies for
Screening, Privacy and
More*

March 3rd

*10 Ways to Spice Up Your
Garden with Summer-
Blooming Bulbs*

- Hot, dry air - low humidity
 - Avoid hot air vents
 - Misting (only lasts about 30 minutes)
 - Group plants together - as one loses moisture (transpires), its neighboring plants benefit
 - Place on gravel tray
 - ✦ Fill saucer or tray with pebbles
 - ✦ Allow excess water to collect in pebbles - add as needed
 - ✦ Pot is elevated above the water on the pebbles to avoid root rot
 - ✦ As water evaporates, it increases humidity around the plant
- Insect damage - more on this later

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WILTING

- Watering issues
 - Too much water
 - ✦ Water fills all pore spaces, replacing oxygen in soil
 - This results in lack of oxygen that limits plants' ability to absorb water
 - ✦ Can increase risk of root rot
 - Fewer healthy roots available to absorb water
 - Lack of water
 - ✦ **Reviving Drought Stressed Houseplants**
 - ✦ Insufficient water to meet the plant's needs
- Over fertilization
 - Damages plant roots
 - Water moves from higher to lower concentrations
 - ✦ Moves out of plants
- Salt build up
 - Has same impact as over fertilization
 - ✦ **Limp and Yellowing Leaves on African Violets**

LEAF DROP

- **Leaf Drop on Weeping Figs**
- Watering Issues
- Potbound
 - **Transplanting Houseplants**
- Cold temperatures
 - During transport or from drafts in the house
 - **Avoid Cold Damage to Indoor Plants**
- Acclimation
 - As plant transitions from greenhouse to retail outlet and finally to your home, it often sheds leaves
 - ✦ **Overwintering Mandevillas Dipladenias**
 - ✦ These leaves are usually replaced once plant adjusts to new location
 - ▶ **Moving Houseplants Indoors**

BUD AND FLOWER DROP

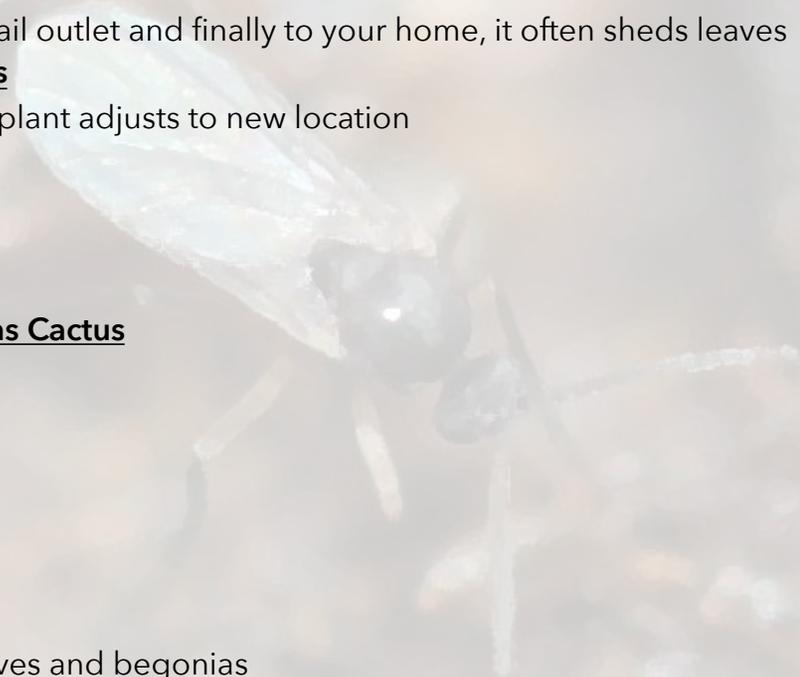
- Drastic changes in the environment or care
 - **Prevent Bud and Flower Drop On Christmas Cactus**
- Excess nitrogen
- Overly dry or wet soil
 - **Flower Buds Falling Off Gardenia**
- Cold water

WHITE OR STRAW COLORED SPOTS

- Cold water damage
 - Most often seen on African violets, its relatives and begonias

OEDEMA (EDEMA)

- **Blisters on leaves that turn into corky lesions**
 - Plant absorbs more moisture than it needs
 - Most common when light changes from high to low
 - ✦ Adjust watering



COMMON INSECT PESTS

- It is often the symptoms, not the insect, we notice first
- Monitor plants regularly
 - Easier to detect problems the more familiar you are with your plants
 - Small populations are easier to manage

APHIDS

- **Eco-friendly Aphid Control**
- Small teardrop shaped insects
- Often clustered and feeding on new growth
- Suck plant juices and secrete the excess as honeydew

SPIDER MITES

- **Eco-friendly Spider Mite Control**
- Not visible to the naked eye
 - White paper test
 - ✦ Hold a piece of paper under the plant, shake and look for specks (the spider mites) moving across the page
 - Do not wait to see webbing
 - ✦ The population is very high and much harder to control
 - ✦ You can still use these controls, it will just take more effort on your part once webbing is visible
- Suck plant juices and secrete excess as honeydew
 - **Clear Sticky Substance (Honeydew) on Houseplants**
- **CONTROLLING APHIDS AND SPIDER MITES**
 - **Non-toxic Management of Pests On Indoor Plants**
 - Strong blast of water
 - Several applications of organic insecticides like insecticidal soap or Neem
 - **Summit Year-Round Spray Oil®** (controls all stages)
 - ✦ Repeat applications of any organic needed as they only kill insects they touch

MEALYBUGS (SOFT SCALE)

- Tufts of cottony, white masses along stems, at base of leaves and on leaves
 - This cottony mass protects the insect below from most insecticides and harsh environmental conditions
- Suck plant juices and secrete excess as honeydew
- Leaves yellow, plant declines in vigor

• CONTROLLING MEALYBUGS

- **Eco-friendly Mealybug Control**
- Touch each cottony mass with cotton swab that's been dipped in alcohol
 - ✦ Dissolves the covering and kills insect below
 - ✦ Treat immature with organic insecticide
- **Summit Year-Round Spray Oil®** (controls all stages)

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On Demand!

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HARD SHELL SCALE

- Hard "shells" on leaves and stems
 - The shell protects insects from pesticides and harsh environmental conditions
- Suck plant juices and secrete excess as honeydew
- Yellow and falling leaves

• CONTROLLING HARD SHELL SCALE

- **Control Scale Insects on Houseplants**
- **Organic Control of Scale on Indoor Citrus Plants**
- Scrape off adult with thumbnail or old toothbrush
- Treat immature stage with an organic insecticide
- **Summit Year-Round Spray Oil®** (treats all life stages)

WHITEFLIES

- Tiny white, fly-like insects - take flight when disturbed
- Suck plant juices and secrete the excess as honeydew
- Leaves turn yellow, growth stunted

• CONTROLLING WHITEFLIES

- Eco-friendly Whitefly Control
- Yellow sticky trap will reduce population
- Organic options - repeat per label directions
 - ✦ Even synthetics require 3 applications, 5 days apart - miss one application and you must start over

FUNGUS GNATS

- Annoying, but usually not a threat to the plant
 - Feed on organic matter and dead roots in soil

• CONTROLLING FUNGUS GNATS

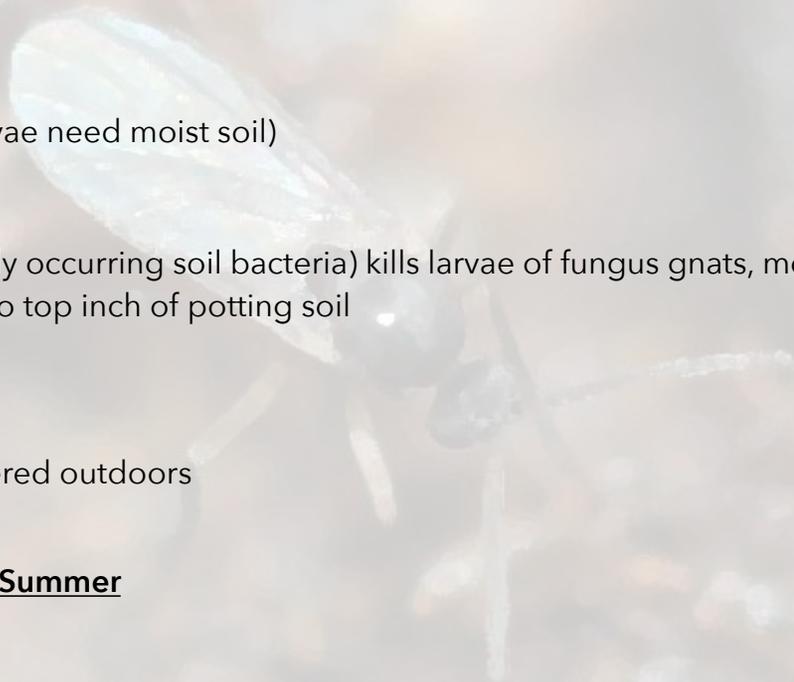
- Eco-friendly Control For Fungus Gnats
- Allow soil to go a bit drier (soil dwelling larvae need moist soil)
- Carnivorous plants
- Mosquito Bits®
 - ✦ *Bacillus thuringiensis israelensis* (naturally occurring soil bacteria) kills larvae of fungus gnats, mosquitoes and black flies
 - ✦ Apply to soil surface and lightly work into top inch of potting soil
 - ✦ Reapply weekly as needed

MILLIPEDES AND SLUGS

- Usually move into potting mix of plants summered outdoors

• PREVENT AND REDUCE RISK

- Houseplants Move Into the Garden for the Summer
- Cover pot with old nylon stocking
- Remove these pests by hand when found



OVERVIEW OF INSECTICIDES

Read and follow label directions whenever using any chemical, including organic, natural and synthetic formulations on your plants

- Horticulture oils like **Summit Year-Round Spray Oil®**
 - Controls all life stages of:
 - ✦ Aphids, mites, scale, mealybugs & whiteflies
- **Mosquito Bits®**
 - *Bacillus thuringiensis israelensis*
 - ✦ Fungus gnat larvae
- Insecticidal soap
 - Aphids, as well as immature mealybugs, scale & whiteflies
- Neem oil
 - Aphids, mites, mealybugs, scale & whiteflies
- Hot pepper wax
 - Aphids & mealybugs
- Pyrethrin
 - Aphids & whiteflies
- Other plant oils
 - Rosemary, canola, clove, garlic and cottonseed
 - Check label as insects controlled and plants that can be treated varies with the type of oil
 - ✦ Aphids, mites, whiteflies, mealybugs & scale crawlers

HOME REMEDIES

Just because it resides beneath the kitchen sink, does not make it safe for you or your plants

- Dish Soap
 - Test a leaf before treating the whole plant
 - Retest with each new bottle, as the formulations can change
- Rubbing alcohol
 - Used to dissolve mealybugs' cottony covering or kill immature scales

A BIT MORE INFORMATION

- See Jeff Gillman books
 - *The Truth About Gardening Remedies*
 - *The Truth About Organic Gardening*

HOUSEPLANT DISEASES

- For a disease to occur
 - Must have a susceptible plant, right environmental conditions and the disease organism present
 - ✦ Remove one of these to prevent and manage disease problems

CULTURAL CONTROL

- Correct the growing conditions
- Remove infected plant part as soon as it is discovered
- Prevent spread by disinfecting tools and hands after handling sick plants
 - Rubbing alcohol
 - Spray disinfectant

POWDERY MILDEW

- White powdery substance on leaf surface
- In severe cases, the mildew prevents light from reaching leaves
 - Leaves yellow, brown and drop
 - **Sooty mold**
 - African violets and **begonias** affected more often than most other indoor plants
- **CONTROLLING POWDERY MILDEW**
 - Increase airflow around plants - spacing
 - Increase light if needed
 - **Summit Year-Round Spray Oil®** prevents fungi from entering leaf
 - Copper soap
 - Baking soda (test leaf before applying to plant)
 - ✦ 1 tsp baking soda per gallon of water
 - ▶ Add a couple drops of soap or horticulture oil to act as a sticker spreader

SPOTS ON LEAVES

- **Spots on Leaves of Philodendron**
- Fungal or bacterial?

CONTROLLING SPOTS ON LEAVES

- Correct watering
- Grow plants in pots with drainage holes

- Do not allow plants to sit in excess water
- Copper soaps

WILTING AND DYING PLANTS

- Overwatering
- Overfertilizing
- Root rot caused by the above or fungal organisms
- **CONTROLLING WILTING AND DYING PLANTS**
 - Correct watering
 - Remove slimy and dead roots
 - ✦ Repot in fresh soil and clean container

ORGANIC FUNGICIDES

Read and follow label directions whenever using any chemical, including organic, natural and synthetic formulations on your plants

- **Summit Year-Round Spray Oil®**
 - Powdery mildew
 - ✦ Not all lightweight oils are labeled for this use
- Neem oil
 - Formulation to manage powdery mildew disease
 - ✦ Check label
- Sulfur
 - Powdery mildew
- Copper soap
 - Fungal leaf spots
 - Anthracnose

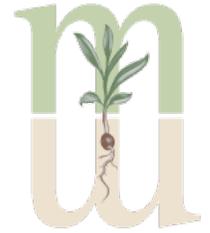


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