

The Indoor Sun

Shedding light on the hobby of indoor gardening and hydroponics

Premiere Issue Vol 1.

Biological Pest management

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Learn more about hydroponics and aeroponics by building your own systems. Click on; www.howtohydroponics.com



Biological pest control means sending good bugs after bad bugs. Tiny Encarsia formosa wasps hatch forth from these cards and lay eggs in Whitefly pupae which destroy the whitefly and later give birth to another Encarsia which will also keep the peace.

Is Your Garden Bugged?

If you're really quiet and you turn your fan down low, you may just hear the sounds of bugs chowing down in your garden. Behold the sap sucking pests that fly in circles and spin ugly webs between your beauties. Take control over these destructive demons of the plant world and rid your garden of them forever.

With biological alternatives to chemical pest control you protect your plants with nature's answer to the gardener's nuisance critters. Is your greenhouse or grow room infested with whiteflies or Spider mites? Have you observed these critters in your garden before?

If your garden area suffers from high heat and humidity and your floor doesn't shine like polished marble, the chances are you have. If so, here are a few tricks to keep them from getting out of control and what to do just in case they do. So put down the pyrethrum and pickup this article to get started with your combat training. We have a war to win and the troops are raring to go.

Greenhouse Whiteflies

Whiteflies resemble tiny moths that gather on the undersides of the leaf surface. When disturbed, whiteflies will flutter up in a cloud of activity for a few seconds before coming to rest on another leaf surface. There are two important varieties of the whitefly, the greenhouse and the sweet potato. The Greenhouse variety seems to be more prominent than the sweet potato variety in the US.



Leaves that fall victim to the insect may appear shiny from the honeydew sap they leave behind. Young whiteflies appear as tiny scale like nodules on the underside of leaves and are just as problematic as the adults since they both feast on plant juices. While the whitefly itself causes some damage to your plants, what finally knocks them down is the black, soot-like mold that rapidly grows on the honeydew they leave behind.

If an infestation reaches this stage, your plants will need to be washed down with soapy water to remove the honeydew and reduce fungus and mold growth. If a good hose down is able to reduce the numbers enough, you should immediately release predator insects to maintain peace on the home front.

Save your seedlings!

Temperature 68-75
with bottom heat



Use only sterile, soilless
starting media



pH between 6.25 and 7.0
for most cultivars



Manage air exchange rate to control
temperature and humidity



Media moist but not saturated,
watch for wilting



Seedlings can benefit from
dilute P and K nutrient



As soon as seedlings emerge, increase
light to full power over the next five days



Excess moisture and humidity created the right environment for fungus to grow and attack this bean sprout that was germinated in an wet, unsterile paper towel.

Whitefly prevention 101

The first line of defense against the whitefly (and all pests and pathogens) is to keep your garden clean and well ventilated with both stirring and [exhaust fans](#) to remove the hot, humid air that bad bugs need to breed. Dead or dying leaves should be removed from the garden as well as any dust or debris that may be brought in from the outdoors. If you're growing indoors, consider building a simple intake filter to clean the air on its way into your garden area. You can make a simple box filter with a lightweight lumber frame and several pieces of air conditioner filter material available at most hardware stores. Place your filter over the fan intake and clean it regularly.



Blue sticky traps attract Thrips, Whiteflies are attracted to yellow. Use 1 sticky trap for every 10 sq. ft. of indoor garden area

Many growers are reporting that running a small ozone generator in the greenhouse or grow room helps reduce and even prevent many whitefly and spider mite infestations. In an article by Nick Cranley that appeared in Maximum Yield Magazine, the author comments on the effectiveness of low concentrations of ozone in the garden area. "In smaller gardens, utilizing less than 3000 Watts of lighting, a small ultraviolet light ozonator like the [Silver Bullet Ozonator](#) can provide not only adequate odor neutralization but also supply a blanket of protection for the plants. "Silver Bullets" will prevent white powdery mildew, spider mites and other airborne pathogens.

What to do when whiteflies strike

Fortunately, treating Whitefly infestations is getting easier thanks to a host of effective products on the market. While some recommend using Pyrethrum spray to knock down populations in a hurry, we've found that applications must be continually made which although the spray is all natural, we prefer using the Whitefly's natural predators to control their population which lasts longer and requires no chemicals, natural or not.

[Encarsia Formosa](#) is a Whitefly parasite that uses their pupae as a place to gestate, forcing the death of the pest and birth of another parasite. Whitefly parasites do best when temperatures average are at least 69 degrees F. Parasites should be applied at a rate of one to three per square foot.

Whitefly predators also known as [Delphastus Pusillus](#) can eat up to 600 Whitefly eggs each day which will put a quick stop to their spread in a hurry. Sweet potato whiteflies are best treated with whitefly predators which work best between sixty-five and ninety degrees F and applied at a rate of 1 per two square feet.

Attack of the Spider Mites

The infamous Spider Mite has earned a charming reputation for ruining many a harvest thanks to the intense damage they can cause in just a short time. First signs of Spider Mite populations are tiny yellow pin pricks sized spots on leaves

Keep indoor gardens free from any debris that gives pests a place to hide and multiply. Discard any faded or dead leaves.

with the telltale little black dots running around the leaf underside. Spider Mite eggs are even smaller than the pests and may require a magnifying glass to spot as they are randomly dispersed across their grazing territory. When an infestation occurs, Spider Mites will spin silky webs from leaf tip to leaf tip, sometimes entombing entire flower clusters much like tent caterpillars do in the South.



Spider mite damage (cucumber leaf) can resemble a nutrient problem in extreme cases like this. Prognosis is terminal!



Defenders of the free world, the Ladybug (Hippodamia convergens) consumes thousands of soft bodied pests in their single year lifetime. Ladybugs are pros at ridding your garden from Aphids, their favorite meal.

The two spotted spider mite is the most popular indoors and are easily distinguished by the two dark spots that appear on the shoulders of their yellowish/green bodies. The darker the spots, the more chlorophyll the mites have consumed from your plants. Spider mites are the most difficult pest to prevent since their minuscule egg cases can be carried in on a gust of wind, just about any debris or dust pile brought in from the outdoors and often times on the back of the family pet. Cleanliness is the best prevention

against the Spider Mite but even the cleanliest indoor gardens can succumb to these mighty mites.

To further confuse the unsuspecting gardener in us, adult females can go dormant for months at a time after photoperiods decrease only to wake up and start laying eggs once again as the season lengthens again.

Hand to hand combat

Spider Mite Predators are a fast and effective means to clean up the mess. Feeding on both live and unborn Spider Mites, these predators go through about 5 mites or 20 eggs per day. After a week or two of breeding since releasing the predators in your garden, their population will usually exceed that of their enemy which inherently speeds up their demise. When the Spider Mites are all gone, the predators turn on each other and consume themselves, leaving your garden empty of anything that moves slower than you.

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Controlling indoor pest problems can be done with a simple routine of prevention, inspection and reaction with Mother Nature's choice for tending garden.

Be sure to visit our website to find all the products mentioned here and more than we could ever fit in four pages!

<http://www.futuregarden.com/environmental>

There are basically three types of Spider Mite Predators;

- Phytoseiulus persimilis work best between 55-105 deg. F and 55-90% humidity.
- Neoseiulus californicus work best between 55-90 deg. F and 60-90% humidity.
- Mesoseiulus longpipes work best between 55-105 deg. F and 45-90% humidity.

Spider Mite Destroyers also eat all stages of the pesky mites. Unlike the predators, destroyers can fly from infestation to infestation but take a little longer (4-6 weeks) to really get going. Use 50 destroyers to get a colony started as their average life-span is 18 days at 70 degrees F.

Five steps to a pest free garden

- Keep your indoor garden free of dead and dying leaves, dust and debris
- Maintain proper ventilation (filtered if practical) at all times, high heat and humidity is the number one enemy
- Use yellow sticky traps to monitor whitefly populations and keep them at bay, parasites and predators to manage larger populations
- Use Spider Mite Predators to manage any size infestation, Spider Mite Destroyers to clean up any remaining survivors however unlikely.
- If you plan to use Pyrethrin sprays to knock down initial infestation, do not use encapsulated spray as it can possibly linger for months and kill off your good bugs too.

Oh, and don't forget to leave the garden spiders alone, they are predators as well and will safeguard your garden against many simple nuisance pests as well.



Visit Our New Website!

The long awaited Futuregarden.com launched earlier this month with an expanded line of products including biological management for just about every pest under the sun, a larger selection on indoor lighting, new aeroponic and hydroponic gardens.

Feedback is always welcome, as are contributions on the subject matter. Email grow@futuregarden.com with your comments or questions.

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Dear Futuregarden,

I want to thank you for the excellent service you have provided to me over the past year. We just got our shipment of lively ladybugs, and the neighborhood children had a great time helping distribute them to the gardens around our house

We have had several orders from you, and each has been processed quickly, and received in excellent condition. Because of your service, I will continue to use Futuregarden and recommend you to our friends.

Sincerely,
Bob K.

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