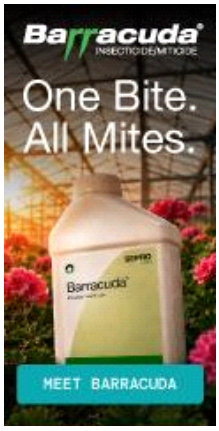
Phytotoxicity of Insecticides, Part 1



Research and News on the latest pest management techniques

GROWERTALKS MAGAZINE greenPROFIT MAGAZINE

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National Greenhouse Manufacturers Association

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Pest Talks

COMING UP THIS WEEK:

What the ... ?
Phyto Disclaimers
Insecticide Phyto I
Fugus Gnat Control



What the ... ?

Spring crops are growing and the temperature is rising. The number of inquiries about critters also goes up.

This is one that I got this week. I think it's a good segue to a reminder I wanted to send you this spring.





What's going on with the lower leaves on this calibrachoa? It's not a difficult one this week. Answer at the end of this week's newsletter ...



Insecticide Phyto: Some Disclaimers

I promised y'all in the last issue of this newsletter that I'll corral information on phytotoxicity of insecticides. The "meat" of this issue is about that. Before that, however, I want to make a few disclaimers. Why? Because I don't want to be hauled to court by someone claiming that a crop was lost or damaged because of this newsletter. (Yes, I'm trying to cover my own behind.)

First, the information I've gathered here is for quick reference only. It doesn't mean that you can base your entire spray program on this collection of information—you must read the pesticide label for crop tolerance or phytotoxicity information. This is your responsibility as a pesticide user, handler and applicator.

I've gathered the phytotoxicity information presented here from the pesticide labels, supplemented with data from the IR-4 Environmental Horticulture Program's crop safety research summaries. I've done my best to scan through the labels and extract relevant information, but I might have missed some important ones. Again, you must read the labels yourself to make sure that you know the crop safety of the products you're going to use.

I also don't have access to phytotoxicity information that isn't published, that you or I have heard about (but are unpublished or aren't based on rigorous trials) or have been mentioned briefly in some research paper (there are millions of published research papers out there). All of this is to say I'm not claiming that I've gathered all the phytotoxicity information. Again, you should read the labels and do the research yourself.

Usually, I read the label of one product per active ingredient. The exceptions are products that contain the same active ingredients, but different formulations (such as SC vs. EC). I didn't read the labels of every product, so please don't call me up because I didn't include your favorite products. You must read the labels yourself. (How many times have I said that now? More than three times? Y'all should be able to remember the "read the labels" statement by now.)

I accessed the insecticide labels through Agrian. I think these labels are the most up to date, but again, I might be wrong. Email me if I used an older version of a label or missed anything. I can provide updates in the next issue after I verify the claims.

Finally, you should conduct a crop safety test before you use a product on a new crop species or cultivar. Just to be sure, you know. Although a "trial" sounds complicated, it's actually pretty easy to do. Email me if you want some guidance on how to run a crop safety trial.

Congratulations on reading through all the disclaimers. Now you know why the men (why is it always men anyway?) on medicine or used car commercials read the fine-print super fast. We can move on to

the main topic today if you promise you won't sue me. Remember this before you call your favorite lawyer: I write this newsletter to make some extra dough. I'm like a dry turnip—you aren't going to squeeze anything out of me.

Check out an e-GRO Alert from Nora Caitlin of Cornell Extenion or an earlier issue of this newsletter if y'all want to learn more about phytotoxicity.



Insecticide Phyto: Part 1

I found quite a bit of phytotoxicity warnings on the labels. I won't be able to list them all here, otherwise this issue is going to be really long. What I'll do is split up and present the information in this (trade names starting with A to K) and next issue (and the rest).

Here's how I organize things: I won't repeat "cannot be used" or similar phrases repeatedly. Instead, the plant species or cultivars listed after each trade name and (in parentheses) active ingredient of a product are those that are sensitive to the product. These plant species or cultivars are listed on the labels because of phytotoxicity concerns, based on my interpretation of the label language.

Some plant species or uses marked as "do not" may not be indicated as such because of phytotoxicity. It's possible that the product isn't registered for use on that specific crop. For example, Sirocco cannot be used on citrus in nurseries. Sometimes, I'm not sure why a species is listed. For example, Adept "cannot be applied to plants grown on capillary water mats." (Perhaps because of water contamination concerns ...?)

Here are the phytotoxicity concerns and interesting plant-related notes that are specified on the labels:

Acephate 97UP (acephate): Balm of Gilead, cottonwood, Lombardy poplar, *Viburnum suspensum*, crabapple (variety Ichonoski, *Malus floribunda*, Pink Perfection, Red Wine and Snow Cloud), *Blechnum gibbum*, *Cissus antarctica, Ficus triangularis*, *Fittonia verschaffeltii*, *Maranta leuconeura kerchoviana*, *Pachystachys lutea*, *Plectranthus australis*, *Polypodium aureus*, *Polystichum*, *Pteris ensiformis*, *Tolmiea menziesii* and chrysanthemum (variety Albatross, Bonnie Jean, Dixie, Garland, Gem, Iceberg, Pride, Showoff, Statesman, Tally Ho, Westward Ho and Wild Honey). May damage flowers of chrysanthemum and roses.

Adept (diflubenzuron): Poinsettias, hibiscus and Reiger begonia.

Altus (flupyradifurone): Foliar application on hybrids/cultivars of *Cucumis melo* including true cantaloupe, cantaloupe, casaba, Crenshaw melon, golden pershaw melon, honeydew melon, honey balls, mango melon, Persian melon, pineapple melon, Santa Claus melon and snake melon). This restriction is likely related to crop group designation than about phytotoxicity concerns. Cannot be tank mixed with DMI fungicides (FRAC 3) during bloom period.

Aria (flonicamid): Certain pansy cultivars. (No specific mentioning of what these cultivars are.)

Avid 0.15EC (abamectin): Ferns (*Adiantum* spp.) and Shasta daisy (*Leucanthemum* spp.). Should not be used for aphid, whitefly or thrips suppression on roses, chrysanthemums or gerbera. This restriction isn't about phytotoxicity concern, but to preserve Avid for mite and thrips management on these crops. IR-4 Program's abamectin crop safety summary indicated that bird's-nest fern (*Asplenium nidus*) may be injured at label rate and poinsettia, schefflera and spathiphyllum may be injured at two or four times the label rate.

AzaGuard (azadirachtin): Tests should be conducted on sensitive crops such as leafy vegetables before full spray. Mildly alkaline spray mixtures should be used immediately to prevent phytotoxicity.

Azatin O (azadirachtin): No specific plant prohibitions, but cautions against applying to wilted, stressed

or newly transplanted plants prior to root establishment.

BotaniGard ES (*Beauveria bassiana*): Poinsettias after bract formation.

BotaniGard 22WP (*Beauveria bassiana*): Use caution when applying to open blooms, especially of sensitive varieties (although no specific plant species mentioned).

Captiva Prime (capsicum oleoresin extract + garlic oil + canola oil): May reduce bloom on crops with "waxy bloom."

Conserve SC (spinosad): Spotting of African violet flowers may occur.

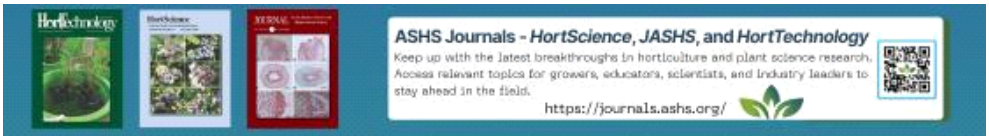
Distance IGR (pyriproxyfen): Salvia, ghost plant (*Graptopetalum paraguayense*), Boston fern, schefflera, gardenia, coral bells and poinsettia after bract formation. Drench on certain poinsettia varieties (Freedom Bright, Freedom Bright Red, Winter Rose and Jingle Bells) are restricted.

Endeavor (pymetrozine): Poinsettias after bract formation

Flagship 25WG (thiamethoxam): Application to yellow honey locust varieties may result in leaf chlorosis and leaf abscission. Do not apply to linden, basswood or Tilia species (by any application method) for pollinator protection. Do not tank mix with fertilizers for treatment of container- or liner bed-grown ornamentals that are sensitive to fertilizers.

Hachi-Hachi SC (tolfenpyrad): Salvia, impatiens, gypsophila, redbud, New Guinea impatiens and poinsettia with colored bracts. Temporary phytotoxicity may occur on ageratum, begonia, colocasia, geranium, ground orchid, lobelia, marigold, pansy flower, verbena and vinca. Impatiens and New Guinea impatiens are also listed as plants sensitive to Hachi-Hachi SC on the IR-4's crop safety summary for tolfenpyrad.

Kontos (spirotetramat): Geranium, orchids, hoya, dracaena, cordyline, schefflera, neanthebella palm and ferns. Limit to one application per season on hydrangea, impatiens, croton, fuschia hybrids, petunia, peperomia and cyclamens. In addition to some plant species listed on the label, IR-4 Program also noted that coleus may be injured if application is made at two or four times the label rate.



No Phyto Noted for These Products

Labels of the following products have been consulted, but not specific phytotoxicity issues are noted:

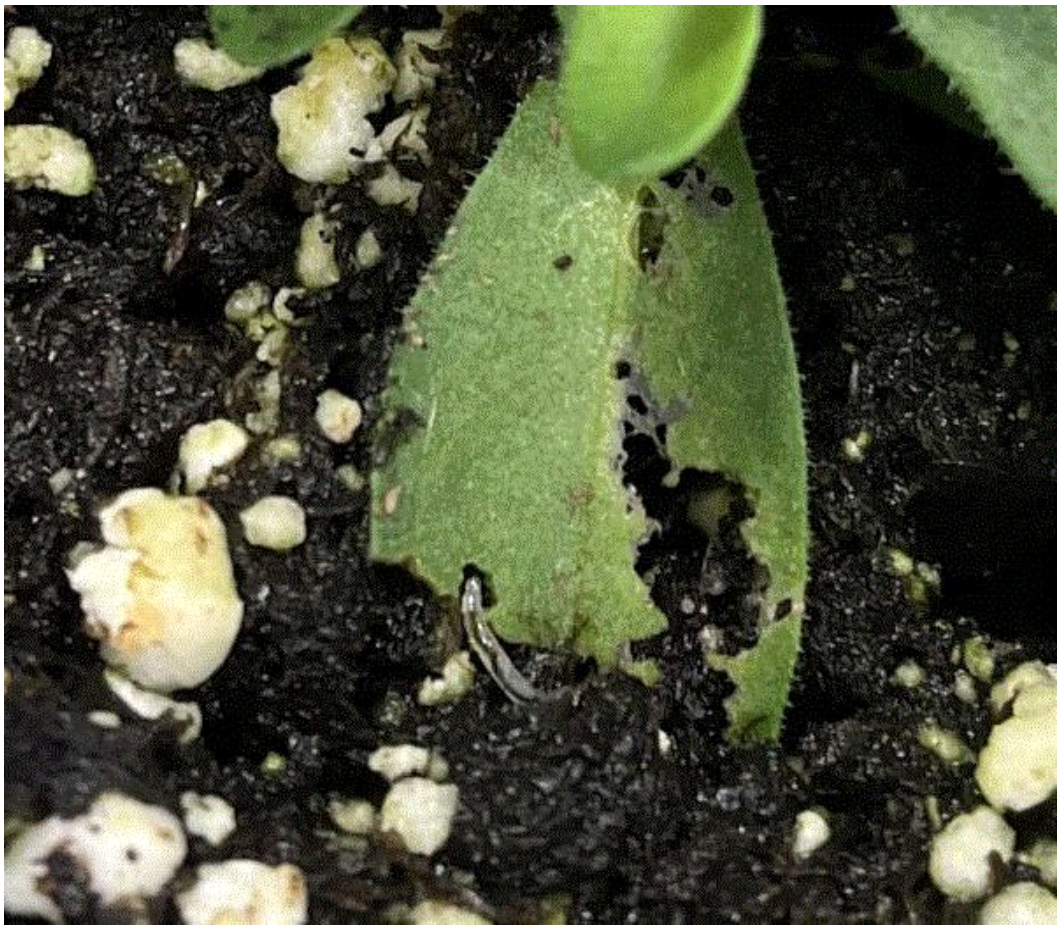
- Acelepryn (chlorantraniliprole)
- Advion Fire Ant Bait (indoxacarb)
- Ancora (*Isaria fumosorosea*)
- Akari 5SC (fenpyroximate)
- BioCeres EC (*Beauveria bassiana*)
- BotaniGard MAXX (*Beauveria bassiana* + pyrethrins)
- Citation (cyromazine)
- Dimilin 25W (diflubenzuron)
- DiPel PRO DF (*Bacillus thuringiensis* subsp. *kurstaki*)
- Enstar AQ (s-kinoprene)
- Epishield (peppermint oil + clove oil)
- Floramite (bifenazate)
- Gnatrol WDG (*Bacillus thuringiensis* subsp. *israelensis*)
- Grandevo WDG (*Chromobacterium subtsugae*): No phytotoxicity noted, but application may leave visible spray deposits on some light-colored flowers.
- Hexygon IQ (hexythiazox)

- Isarid (*Isaria fumosorosea*)

I'll have Part 2 of the insecticide phytotoxicity summary in the next issue.

Answer to "What the ... ?"

What's causing the chewing damage to the calibrachoa leaf in the picture? If you take a closer look, you'll see that the leaf is touching the media. Take another look and you'll see a fungus gnat larva is feeding on the leaf!



Fungus gnats love spring crops. Why? Temperatures are cooler so evaporation is lower and the media stays moist all the time. You get fungus gnats when media is constantly moist. Sure, you may have started the crop with clean, dry media, but there's no guarantee that the plugs are uninfested. The easiest way to deal with infested plugs is to do a sprench of insecticides to reduce larvae before the plugs are transplanted. (See below for what to use.) The treated plugs should be set aside until the REI has expired before transplant.

I contributed an article on fungus gnats to the Proceedings of the International Plant Producers Association meeting, which I think will come out any day now. Here are some highlights from that article:

- Fungus gnats prefer media with high peat moss or compost contents.
- Fungus gnats prefer media that's biologically active, but studies have shown that media containing arbuscular mycorrhizal fungus or *Bacillus pumilus* don't reduce fungus gnat abundance.
- Irrigation management is paramount. Media should be allowed to dry out between irrigation

sessions. Dry surface is less attractive to females and less suitable to developing eggs and larvae.

- Biological control agents—such as predatory mite (*Strateolaelaps scimitus*), rove beetle (*Dalotia coriaria*) and entomopathogenic nematode (*Steinernema feltiae* in Nemasys) and bacteria (*Bacillus thuringiensis* subsp. *israelensis* in Gnatrol)—can be effective in suppressing fungus gnat populations.
- Adults can be knocked down with contact insecticides, such as acephate, pyrethroids, neonicotinoids and chlorfenapyr, when necessary.
- Fungus gnat management cannot be successful without managing the larvae. Some of my go-tos for larval management are drenching or sprenching with neonicotinoids, insect growth regulators (s-kinoprene, pyriproxyfen and cyromazine), chlorfenapyr and azadirachtin. Don't forget the entomopathogenic nematodes and bacteria previously mentioned.

See y'all later!



JC Chong
Editor-at-Large
PestTalks

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