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# Insecticides and Plant Sensitivity

*Insecticides can be very valuable tools, but be aware of plant sensitivity.*



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Growers often bring in samples of injured plants to our insect and disease diagnostic labs seeking to learn or confirm what might have caused the problem. For example, a recent sample of begonia showed leaf blotches somewhat similar to thrips damage. In this case, however, under the microscope spray residue was associated with most of the lesions, so we concluded the symptoms were likely due to a chemical application. Though not extremely common, it is also not rare to see chemical injury on plants. Easily confused with symptoms caused by environmental or nutritional problems like cold temperatures or boron deficiency, we can often sort out and pin down the cause(s). Experience helps a lot, but with a bit more information it is easier to reach reasonable conclusions.

It is almost a rule in these cases that the insult occurred around 10 - 14 days prior to the inquiry,

and sometimes much sooner. We consider factors such as recent weather (unusual heat or cold?), crop requirements (prefers higher pH? prone to iron deficiency?), pattern

(evenly distributed in the crop or across cultivars? Localized to one or a few plants? Only recently expanded leaves affected?), and of course what applications (products, rates,



*Flowers and foliage on one set of impatiens were damaged following spray with an experimental insecticide.*

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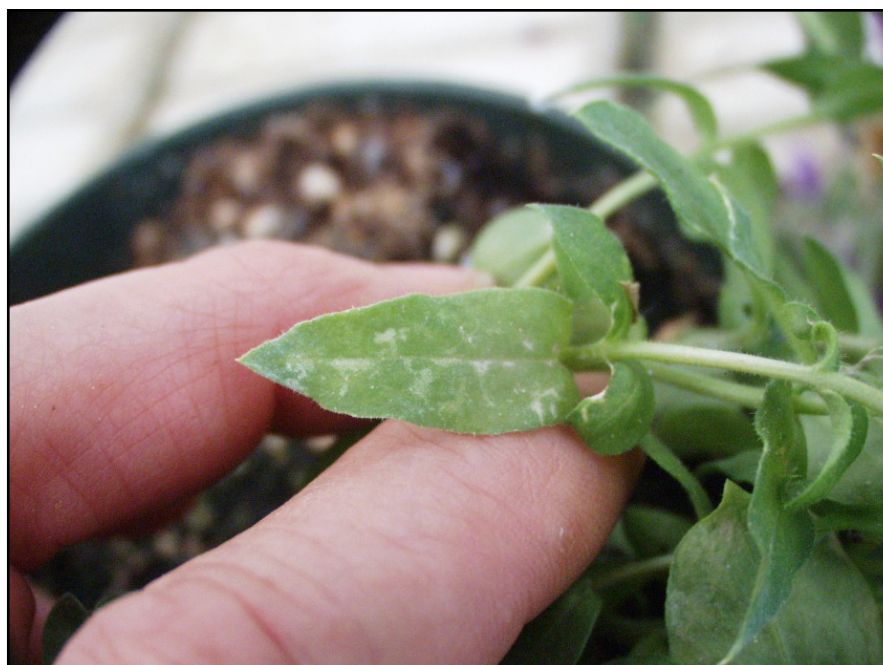
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*White blotches on leaves on this phlox are signs of injury from an insecticide application.*

methods, dates) have been made over the last several weeks. Sometimes products have a strong track record of safety at label rates but may cause injury to some plants if over-applied. Chemical injury, also known as phytotoxicity, may appear quickly following an application. Sometimes the effect is delayed much later, visible only after new and tender growth expands.

Labels usually note known cases of plant sensitivity to the product, or plants not recommended for treatment. If there is a question contact the manufacturer's technical representative and/or regional Extension staff. Other growers are often great sources of information too, and the IR-4 Project has been a leader in supporting crop safety research with a helpful database growers

can consult (<http://ir4.rutgers.edu>). Knowledge is imperfect, however, particularly with the introduction of new crops, so it is always prudent to conduct a small-scale test across cultivars (varieties may vary in sensitivity) with any new crop, product or tank mix combination using your own equipment and application method, waiting several days for possible symptoms to start appearing. This is particularly true when including an adjuvant (such as a wetting agent), some of which can be injurious on their own. Usually spray water with a pH lower than 7 is best; adjust with a conditioner or acidifier. Since I often need to refer back to labels on plant safety, growers may find the following list helpful, summarizing many statements on herbaceous plant sensitivities with some



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additional observations from our work. As always, be sure to review and follow all label directions and restrictions before using any product.

Adept: Do not apply to poinsettias, hibiscus, or Rieger begonia.

Aria: Some sensitivity seen on pansy (and viola) cultivars

Avid/generics: Not recommended for use on ferns or Shasta daisy. We have seen very slight bronzing on white bracts of some poinsettias but only at the 8 oz rate.

BotaniGard ES: We have observed injury to poinsettia and to tomato with the liquid but not with the WP formulation.

Distance IGR: Phytotoxicity has

been observed on the following plants: Salvia (*Salvia* spp.), Ghost Plant (*Graptopetalum paraguayense*), Boston Fern (*Nephrolepis exaltata*), Schefflera (*Schefflera* spp.), Gardenia (*Gardenia* spp.) and Coral Bells (*Heuchera sanguinea*). It is therefore recommended that DISTANCE not be used on these plants. Do not apply to poinsettia after bract formation.

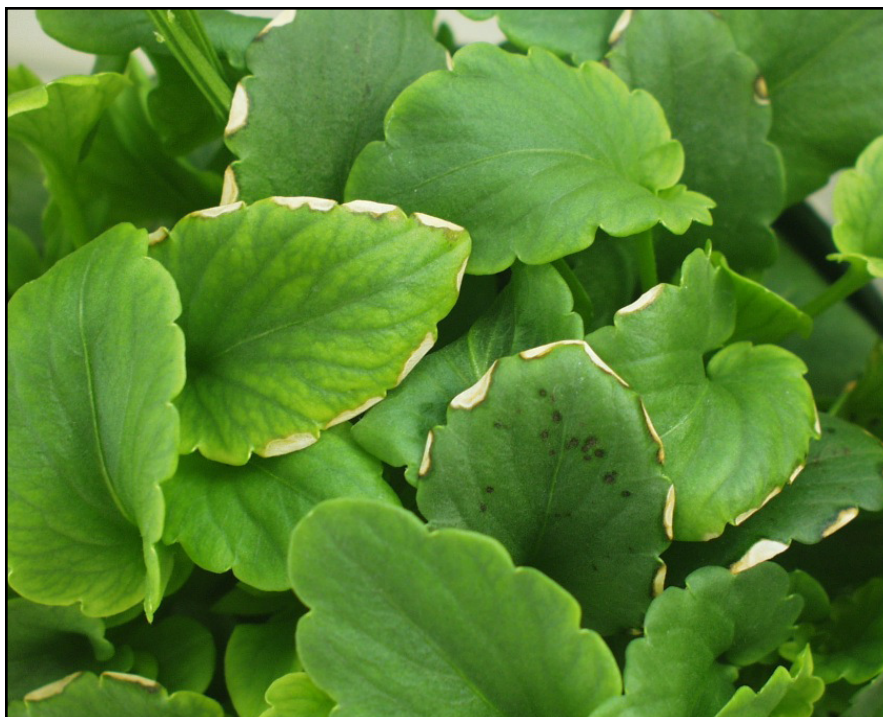
DuraGuard ME: Direct treatment to some open blooms may cause petal drop. Do not use on kalanchoes.

Endeavor: Do not apply to poinsettias after bract formation.

Hachi-Hachi: Do not apply to *Salvia* spp., *Impatiens* spp., *Gypsophila* spp, or poinsettias with bracts in color. Temporary



Dead spots or blotches and yellowing are some signs of chemical injury, here on salvia.



*Marginal 'burn' and dark spots on these pansy leaves is from insecticide phytotoxicity.*

phytotoxicity has been seen on *Colocasia*, *Geranium*, *Lobelia*, Pansy (flowers), *Verbena*, and *Vinca*. We noted some injury to 'Intensia Blueberry' phlox but not other varieties in one trial.

Hexygon DF: On orchids, do not tank mix with Plyac or household detergents. Do not apply to plants under stress or those not acclimated to a new environment.

Horticultural oil (SuffOil-X, SunSpray Ultra-Fine Spray Oil, Ultra-Pure Oil): Note tank mix incompatibilities and restrictions or cautions concerning application to some woody plants. We have seen some sensitivity on some greenhouse crops so be sure to test first. Do not apply to plants under moisture or drought stress and when environmental

conditions are unfavorable (high heat and humidity).

Judo: Do not use Judo on geraniums (*Pelargonium* sp.), Peperomia, Dracaena, and 'Classy', 'Attache', or 'Vogue' varieties of rose. Insufficient information on tolerance is available for lily-of-the-Incas (*Alstromoeria*), New Guinea impatiens, Bacopa, ferns, phlox, English ivy (*Hedera helix*), cyclamen, *Agyranthemum*, hydrangea, schefflera, *Matthiola* (stock), Mexican heather, *Lobelia*, fuchsia, Cordyline, croton, neanthebella palm, and primula. It is recommended that Judo not be used on these plants. Do not apply more than 2 fl. oz. per 100 gal per application or 4 fl. oz. per cropping cycle to chrysanthemum, Shasta daisy, snapdragon, impatiens,

verbena, lantana, gerbera daisy, or marigolds.

Kontos: not recommended for: geraniums (*Pelargonium* spp.), orchids, hoya, Dracaena, Cordyline, schefflera, neanthebella palm, and ferns. Do not make more than one application per season to Hydrangea, *Impatiens* spp., crotons (*Codieum* spp.), fuchsia hybrids, petunia, peperomia, stock, or cyclamen.

M-Pede: Note label discussion of plant sensitivity, tank mix incompatibilities, and pH. Do not apply to horsechestnut, Japanese maple, mountain ash, Cherimoya, bleeding heart, or sweetpeas. Bald cypress, begonia, chrysanthemum, Crown of Thorns and other euphorbia, cucumber, delicate ferns, narrow leaf evergreens (especially when stressed or when tender new growth is present), Dieffenbachia, fuchsia, gardenia, impatiens, jade plant, lantana, ornamental ivy, palms, poinsettia, redbud, river birch, schefflera, Zebra plant and some succulents may be sensitive. Flowers of plants including African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca and zinnia may be injured when sprayed.

Magus/ Magister: Do not apply to roses or to plants under stress.

Orthene TTO/Acephate: Phytotoxicity has occurred on the following foliage plants: *Bletchum gibbum*, *Cissus antarctica*, *Ficus triangularis*, *Fittonia verchaffeltii*, *Maranta leuconeura* kerchoveana, *Pachystachya lutea*, *Plectranthus australis*, *Polypodium aureus*, *Polystichum*, *Pteris ensiformis*, *Tolmiea menziesii*. Before treating large plantings spray only a few plants and observe 2 weeks for varietal phytotoxicity. Application on poinsettias after bract formation may result in phytotoxicity on certain varieties. Application to roses in flower may result in flower damage. Do not apply more often than once every 28 days to carnations and chrysanthemums. Phytotoxicity has occurred on the following chrysanthemum varieties: Albatross, Bonnie Jean, Dixie, Garland, Gem, Iceberg, Pride, Showoff, Statesman, Tally Ho, Westward Ho and Wild Honey. Application to chrysanthemums in flower may result in flower damage.

Ovation: Bright magenta residue may be apparent on light-colored flowers and foliage.

Pedestal: Do not apply to poinsettias.

ProMITE/Vendex: Under greenhouse conditions, foliage and flowers of certain species may demonstrate sensitivity to repeat applications. Occasional minor sensitivity has been observed on *Salix melanostachys* (common

willow), *Asplenium bulbiferum* (spleenwort garden fern), *Dryopteris erythrosora* (wood fern), *Cercis canadensis* (common redbud), *Camellia japonica* (red garden camellia), *Pellaea rotundifolia* (button fern), *Davallia fejeensis* (rabbit foot fern), *Asparagus meyeri* (Meyers asparagus fern), *Asplenium nidus* (birdnest fern), *Adiantum cuneatum* (maidenhair fern), *Celosia argentea* (cockscomb), *Verbena hortensis* (verbena), *Ageratum houstonianum* (floss flower), and *Rosa* sp. (common rose - some varieties, esp. yellow).

Pylon: Phytotoxicity is likely following application to Dianthus (including carnations, pinks and Sweet William varieties, *Dianthus* spp.), Kalanchoe (*Kalanchoe blossfeldiana*), poinsettia (*Euphorbia pulcherrima*), roses (*Rosa* spp.), Salvia (*Salvia* spp.) Zinnia (*Zinnia* spp.). Avoid application to plugs in early development (1 - 2 leaf stage). Tank mixing with crop oils, surfactants and fertilizer adjuvants is not recommended.

Shuttle-O: Test first on impatiens and roses before large-scale use.

Tame 2.4EC: High-gallonage applications to certain chrysanthemum varieties may result in crop injury. Do not apply to chrysanthemums and roses with open flowers. Application of Tame 2.4EC + Orthene tank mix on poinsettias after bract formation may

result in phytotoxicity on certain varieties.

Tetrasan 5WDG: Do not apply to poinsettia after bract formation

Triact 70: Do not apply to known sensitive plant species, such as impatiens flowers, fuchsia flowers, hibiscus flowers, some rose flowers, ornamental olive trees or some carnations varieties, without prior testing. Do not apply to wilted or otherwise stressed plants, or to newly transplanted materials prior to root establishment. Use with care on plants with tender tissue.

TriStar 8.5SL: There have been recent reports of some injury to certain verbena cultivars - test first before large-scale use.

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