Ornamental insect controls: Changes to come

Why you should look at alternative controls for insect pests that damage trees and other ornamentals.

By DAVID SHETLAR, Ph.D.

The combination of economics and the Food Quality Protection Act seem to be working together to reduce the number of chemical controls for ornamental pest insects and mites.

With this in mind, you may want to try alternative products to treat major insect and mite pests. You don't need to switch to them today, but try them on a limited basis to see which ones fit your needs.

Outside jobs

Exposed foliar-feeding insects (caterpillars, sawflies and aphids) are easy to knock down with broad spectrum organophosphate and carbamate insecticides like Dursban®, diazinon, Orthene®, Sevin® and malathion. More recently, pyrethroid chemistry (especially Astro®, DeltaGard®, Scimitar®, Talstar®, Tempo®) has begun to replace the OPs and carbamates. The pyrethroids are an excellent choice for most operations, though exposed applicators often get skin sensitization problems.

Least toxic alternatives are insecticidal soaps (2%) and horticultural oils (1.5%), but the target pests must be "hit" by the spray; there is no residual effect. Newer insecticides such as Merit® and Conserve® are effective, but the target insects need to be in the younger stages for maximum efficacy. This is also true for *Bacillus thuringiensis* (Bt) which can control numerous caterpillars *if* the caterpillars ingest the material when they are less than half grown.

Inside jobs

One strategy for control of leafminers is adulticides. The traditional products have been Dursban, Sevin and Dylox® (flies only). Alternative products include the pyrethroids Astro, Scimitar and Talstar.

The other strategy is to control the larvae with systemics, which have included Cygon® (=Dimethoate®), Di-Syston® and Orthene. Cygon and Di-Syston are usually applied to the soil for root uptake. Orthene is commonly sprayed, though it can also be soil injected for root uptake. Products containing azadiractin (e.g., Azatin® and BioNEEM®) can be sprayed. Merit® is the only really new systemic insecticide available but has very slow root uptake, so it's best used as preventive leafminer control, not as a curative. Most people recommend that the Merit soil applications be made a minimum of 40 to 50 days prior to when the leafminers are expected. For leafminers expected in May (e.g., birch and holly leafminers), good control has been achieved by making the Merit soil injection in the previous October or November.

The escape artists

Borer control remains difficult, and the best control is to keep the plants healthy and avoid water stress conditions. As with leafminers, borer control insecticides are targeted against the adults and their invading larvae (preventive control). Or, systemics are used to kill the larvae already within the plant (curative control). Dursban and lindane trunk sprays have been the traditional preventive insecticides. Di-Syston and Dimethoate have been the principal systemics used, though injection systems that use Orthene, Bidrin® and Metasystox-R® are well known.

Unfortunately, there are few real alternatives to Dursban and lindane which, when applied to the corky bark of trees, provide 30 to 50 days of effective residual action. Scimitar, Talstar and Turcam® can provide protection, but require two to three applications to cover the same 30 to

50 days. Merit has also been discussed for borer control (both as soil injection and tree injection), but results have been inconsistent. Again, it appears that Merit has to be applied 30 to 40 days *prior* to when the borer invasion is expected.

Sucking the system dry

Scale control has always been difficult to achieve, most likely because landscape managers do not make their applications at the optimum time — when the crawlers are active. Traditional crawler control products have been diazinon, Dursban, malathion, Orthene and Sevin, with dimethoate and Di-Syston being soil-applied systemics. The pyrethroids DeltaGard, Scimitar, Talstar and Tempo are excellent alternatives for crawler control. Insecticidal soaps and horticultural oils also do well if they're applied as high-volume cover sprays that contact the crawlers or recently settled crawlers. Merit (sprays and soil applications) only seems to affect the soft scales, not the armored scales, and is best applied after the crawlers have settled, usually in July or August (except for the magnolia scale that may have crawlers emerging in late August).

This spider is no hero

Almost everyone considers "spider mites" to be the notorious twospotted spider mite. In fact, in most landscapes, only viburnum, winged euonymus and perennials are the common hosts of this mite. Mites on other trees and shrubs are likely some other species of spider mite. Most conifers are likely to be infested with the spruce spider mite though there is also an arborvitae spider mite.

Why is it important to know which mite you are dealing with? First, twospotted spider mites are often resistant to registered miticides, and second, mites may be cool-season or warm-season pests.

When dealing with twospotted spider mites, insecticidal/miticidal soaps and horticultural oils are almost the only choice. Thorough coverage, especially on leaf undersurfaces, is essential. Treat early when the first signs begin, usually in mid- to late May, and retreat if the mite does not appear to be coming under control.

Cool-season mites are best controlled in late September through mid-November or in late April and May. The spruce spider mite is the most common mite in this category, though the southern red mite is fairly common on certain shrubs. Warm-season mites are best controlled when their populations first begin, mid- to late May.

Most spider mites (except for the twospotted spider mite) overwinter as eggs attached to the bark of host plants. True dormant oils can kill these eggs and reduce the mite risk (see "Winter is Good for Hort Oil," LM, Feb. '99). As far as miticides are concerned, Bayer has announced that it is no longer producing Morestan® so once existing stocks are gone, that's it! Kelthane® or dicofol is also very difficult to find and is also likely to be lost.

That leaves dimethoate (very limited plant listing) and Orthene (especially soil applied) as the only traditional chemistry with miticidal activity. The pyrethroids DeltaGard, Scimitar and Talstar have "mite suppression" on their labels but repeat applications are needed to achieve good control. Avid® is still available and is quite good on most spider mites. Conserve is the newest ornamental miticide though repeat applications are also needed to achieve control. Soaps and oils may be the best alternative but thorough coverage of the plants' upper and lower leaf surfaces is essential for success.

If you haven't already started looking at alternative pesticides, especially the pyrethroids, Merit and Conserve, now is the time to start. You should also try using insecticidal/miticidal soaps and horticultural oils as general-use controls for most exposed insects and mites. **LM**

The author is Associate Professor of Landscape Entomology at The Ohio State University, Columbus, OH.

(top) Birch leafminer early mines. One mine opened to show larva that is susceptible to systemic insecticides.

(bottom) Rhododendron borer adult. Apply preventive treatments in May and June when adults fly.

(top) Twospotted spider mites which are often resistant to miticides but susceptible to soaps and oils.

(bottom) Euonymus scale settled crawlers. These are still susceptible to sprays because they haven't formed their waxy coverings.