



New Hope On The Horizon?

New insecticides and miticides are being developed to help in the battle against pesky greenhouse pests.

By Jim Bethke

For the last few years, the prospects for new chemistries were rather bleak, so it finally feels good to have some hope. In addition, most of the new chemistries are reduce-risk or organophosphate (OP) replacement products. IR-4 (www.ir4.rutgers.edu) has had a lot to do with the increased interest in pesticide development and label enhancements for minor crops like ornamentals, and it deserves some credit.

A Word About Generics

To be generic means that an active ingredient (AI) (molecule) sold or formulated under a trade name is no longer protected by patent or trademark. You will start seeing many more generic formulations of pyrethroids and the neonicotinoid imidacloprid. Imidacloprid was the first neonicotinoid developed for the ornamental market and is relatively old when compared to others. For example, Australia-based NuFarm Limited is developing a 2F formulation of the neonicotinoid imidacloprid (trade name Mallet) and a pyrethroid bifenthrin (trade name Menace) for the ornamental market.

One word of caution about generics: When we say generic, it is the AI that has lost patent, so companies developing the generics are reformulating the off-patent AIs. In some cases, a new formulation can really be an advantage, but in others, there may be a learning curve. The original developers know the product's limitations and formulation and how it works in different situations. However, critical issues concerning phytotoxicity, odor and compatibility are largely unknown with generics.

Reregistration Decisions

The EPA, via amendments to the Federal Insecticide Fungicide and Rodenticide Act (FIFRA), is conducting a pesticide reregistration program. The goal of the program is to mitigate risks associated with older pesticides. In addition, all pesticides in food crop uses must meet the safety standard of section 408 of the Federal Food, Drug and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act of 1996 (FQPA). Also, the Pesticide Registration Improvement Act (PRIA) of 2003 became effective on March 23, 2004. Among other things, PRIA directs the EPA to complete Reregistration Eligibility Decisions (REDs) for all remaining non-food-use pesticides by Oct. 3, 2008.

These reviews affect many pesticides, resulting in manufacturers removing many AIs from the market.

Pending completion of the OP cumulative assessment, the EPA has determined that the OP insecticide DDVP, or Dichlorovos, will be eligible for reregistration. The EPA has reviewed the remaining uses of DDVP and determined that risks do not exceed levels of concern; therefore, no additional risk mitigation measures are necessary at this time. However, the manufacturer is voluntarily deleting DDVP use in greenhouses, greenhouse handheld foggers, total release foggers, lawns, turfs and ornamentals. For more information, go to www.epa.gov/pesticides/op/ddvp/ddvp_changes.htm.

Another product affected by REDs is the carbamate Carbofuran. Due to the high risk to the environment and workers, the EPA is recommending all uses of Carbofuran be cancelled.

The EPA has completed the review of the organophosphates and carbamates and is now beginning to implement REDs on pyrethroids. Permethrin is currently under review. The EPA has determined that the data to support reregistration of permethrin are substantially complete and products containing permethrin are eligible for reregistration. However, registrants are required to amend the product labels to reflect the mitigation measures outlined in the RED document, and they are extensive.

Finally, some products were scheduled to be summarily cancelled unless the manufacturer's request for cancellation was withdrawn by Aug. 21, 2006. The list includes a large number of products, and most of them do not pertain to ornamentals. To see products on the voluntary cancellation list, go to www.epa.gov/fedrgstr/EPA-PEST/2006/February/Day-22/p2492.htm.

The reason I bring these issues up regarding the EPA reviews is that you have a say in the matter. The EPA actively requests comment by all, which includes the end users. See the EPA Web site for more information.

Miticides

Pylon (chlorfenapyr) from OHP now has a greenhouse vegetable label. For ornamentals, it is a miticide/insecticide with activity on numerous caterpillar species, spider mites, broad mites and foliar nematodes. The ornamental label will now be



Spider mite damage.

expanded to include thrips (western flower thrips and melon thrips) at a rate of 10 fl.oz. per 100 gal.

Judo (spiromesifen), the latest miticide/insecticide product from OHP, has been available for a while, but it is noteworthy because it has a unique mode of action. This makes it a great product to put into a resistance management rotation. It has also an excellent product against the Q biotype whitefly. In addition, it has shown a significant effect on the pupal stage. OHP is interested in its development for ornamentals, especially in the expansion of the crop safety portion of the label.

While I am on the subject of miticides, Sanmite (pyridiben) is an older miticide with a unique mode of action. Gowan recently acquired the rights to Sanmite. Sanmite is still a very important product because it has activity against whitefly eggs and early nymphs. It is also very effective against the Q biotype whitefly.

Insecticides

A change to the Marathon 60WP (imidacloprid) label by OHP allows the product to be applied as a foliar spray, in addition to the drench, chemigation and ebb-and-flood applications already on the label. This brings the Marathon 60WP label into harmony with the Marathon II label.

A turf product, Mach 2 (halofenozide, 2SC), from Dow AgroSciences, is known for its activity against white grub and lepidopterous larvae.



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Mach 2 has a novel mode of action that mimics the action of natural insect hormones and induces the molting and metamorphosis process in insects. Dow AgroSciences is considering expanding its label to include container- and field-grown ornamental and nursery plants. This is one case where IR-4 can really be of help.

It never hurts to have another thrips product on the market, and Valent has been developing

a good candidate — Overture (pyridalyl). The mode of action of Overture is not yet known, but it is suspected that it has a novel biochemical action different than the more common insecticides. Valent is expecting registration by the end of this year and is interested in expanding the label to include lepidopterous larvae and thrips species other than western flower thrips. According to Valent, this product is

effective against pyrethroid-resistant insects and safe on beneficials.

Neonicotinoids

The newest neonicotinoid on the market is a clothianidin from Arysta LifeSciences, with product names Celero 16 WSG for the ornamental market and Arena 50 WDG for the landscape market. Celero is active as a systemic, primarily against

Insecticides/Miticides With Activity

Trade Name	Common Name	Company	Spectrum Of Activity	IRAC Mode Of Action
Akari 5SC	Fenproximate	SePRO	Broad, cyclamen and spider mites	21
Allectus	Imidacloprid/bifenthrin	Bayer Crop Science	Chinch bugs, cutworms, white grubs	4 and 3
Celero 16 WSG/Arena 50 WDG	Clothianidin	Arysta LifeScience	Homopterans plus others	4
Discus	Imidacloprid/cyfluthrin	Olympic	Homopterans plus others	4 and 3
Flagship 25WDG	Thiamethoxam	Syngenta	Homoptera, white grubs, fungus gnats	4
Judo / Forbid 4F	Spiromesifen	OHP / Bayer	Mites, whiteflies and psyllids	23
Mach II	Halofenozide	Dow Agrosciences	White grubs, lep larvae	18
Mallet 2F	Imidacloprid	Nufarm	Homopterans plus others	4
Marathon 60WP	Imidacloprid	OHP	Homopterans plus others	4
Menace 7.9% F	Bifenthrin	Nufarm	Broad spectrum	3
Overture	Pyridalyl	Valent USA	Thrips and lep larvae	n/a
Pylon	Chlorfenapyr	OHP	Mites, worms, foliar nematodes	13
Safari 20SG	Dinotefuran	Valent USA	Homopterans, leafminers, lacebugs	4
Sanmite	Paridiben	Gowan	Spider mites and broad mites	21
Spirotetramat	Spirotetramat	Bayer Crop Science	Sucking insects	23
Tebufenpyrad	Tebufenpyrad	Nichino America	Mites	21
Tolfenpyrad	Tolfenpyrad	Nichino America	Worms, thrips and aphids	21
Tristar 70WP and 30SG	Acetamiprid	Cleary Chemical	Homopterans plus others	4

Homopterans = aphids, whiteflies, scale, mealybugs, psyllids, etc.
IRAC = Insecticide Resistance Action Committee

Figure 1. Shown here is a listing of the products mentioned in this article as well as their common names, companies, activities and modes of action.

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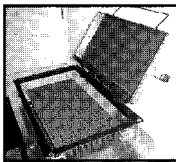
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homopteran insects like aphids, whiteflies and mealybugs. It is versatile in application, being effective in the form of seed treatments, root drench, planting hole application as well as foliar sprays. Celero is registered for use on flowers, foliage plants, trees, shrubs, evergreens, ground covers and interior plantings. We've found that as a drench and spray, clothianidin works very well against sharpshooters, aphids and, more recently, leaf-feeding beetles.

Safari 20SG (dinotefuran) is the new name for Valent's relatively new neonicotinoid. A label update has been submitted to the EPA that expands the label to include more "user-friendly" verbiage for field-grown and landscape plants and a section on trunk injections. The Safari label is also being updated with the scale and mealybug data generated through the IR-4 high priority projects. Safari can be used to control homopterous insects like scales, aphids, mealybugs and whiteflies but will also affect leafminers and lacebugs. We've used it as a spray and a drench and have experienced very good results on everything we've tested it against, including aphids, mealybugs, sharpshooters and Q biotype whiteflies.

One product that has made quite a hit here in California is Discus Nursery Insecticide (imidacloprid 2.94 percent/cyfluthrin 0.7 percent, flowable) from OHP. We've seen very good results against glassy-winged sharpshooters (leafhoppers), mealybugs and aphids on roses, and mealybugs on azaleas. OHP has modified the Discus label to allow application via chemigation.

Bayer Environmental Science and FMC Corp. formed an alliance to commercialize Allectus, a new insecticide that combines FMC's Talstar (bifenthrin) and Bayer's Merit (imidacloprid). Allectus is available in granular and suspended concentrate formulations and is active against various white grub beetle larvae in turf and mole crickets, cutworms, webworms and ants. Allectus SC is registered for use in lawn, landscape and sports turf.

Flagship 25 WDG (thiamethoxam) from Syngenta has been on the market for a while now, but the landscape product is new. It will be called Meridian and, hopefully, will be available in early 2007.

Cleary introduced TriStar 30 SG (acetamiprid), a soluble granule formulation that can be measured and used in quantities down to backpack size. Cleary expanded both the TriStar 70 WSP and TriStar 30 SG labels to include new pest groups and additional pests. TriStar remains effective as a foliar spray against the A, B and Q biotype whiteflies. It's always good to look to something new, and Cleary is currently doing research on two insecticides, including an IGR and a miticide.

New Active Ingredients

In the "products on the possible horizon" category, there are two active ingredients that are relatively new to ornamentals — tebufenpyrad and tolfenpyrad — both from Nichino America. Both AIs are from a new chemical class, the Pyrroles, but their mode of action is similar to SePRO's



Whitefly damage. (Photo: Stan Gill)

miticide Akari (fenproximate), a mitochondrial electron transport inhibitor (Complex I). They are from a different class and can be rotated with other common insecticides and miticides of other classes. Tebufenpyrad is a broad-spectrum miticide, and tolfenpyrad is effective against moths, thrips and aphids. Both products are under evaluation for development in ornamental crops.

Bayer Crop Science has been developing the new tetrionic acid class of insecticides, which includes Judo/Forbid (spiromesifen), an insecticide/miticide mentioned above. The new product is spirotetramat. The mode of action of the tetrionic acid class is inhibition of insect lipid (fatty acid) biosynthesis. Spirotetramat is systemic and offers a diverse spectrum of activity, principally on sucking insects.

You may be wondering if there is ever going to be new numbered compounds to look forward to again. Many of the big companies are going back to their libraries in search of old chemistries that they already spent a lot of time and money developing but never made it to market. Along those lines, FMC has sold its R&D pipeline to BASF, and BASF is now sorting through its own library, and FMC is searching for effective compounds to develop.

Finally

There seems to be a great potential for the new classes of chemicals that are on the horizon. Figure 1, left, shows a listing of the products mentioned in this article. The use of chemical trade, common or corporation names does not constitute an official endorsement, nor does the unintended exclusion of chemical trade, common or corporation names imply that they are not suitable for their intended purpose. **GPN**

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Producing a high quality formulation that consistently results in good plant uptake without damage is a challenging task. When tank mixing products for the first time, especially of different formulations, doing a jar test is good practice, mixing a small amount to check for product compatibility, and testing the mixture by spraying a small number of plants to check for potential phytotoxicity.

Formulation components are critical, especially for PGRs, since they are applied at very low concentrations and any mistake or reduction in formulation quality can cause plant damage. Growers have learned that an important feature of Bonzi is that it is very safe to the plants and there is very little risk of injury to or burning of crops when used as directed. This is because it is a water-based formulation utilizing high quality adjuvants and ingredients. Many hydrophobic chemicals are formulated in petroleum-based solvents and applied as emulsions, which carry a much greater risk of phytotoxicity problems.

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