



# Catalysts for Change

Compiled by Paige Worthy

**S**eated at this year's chemical trends roundtable are five of GPN's contributors, savvy experts in the fields of plant growth regulators, and pest and disease control. The following pages contain their observations on the chemical industry as it stands now — and their predictions for the future.

## In the past 12 months, what new developments have occurred in your field?

**Margery Daughtrey:** The largest ripple for 2008 should be felt from the release of Pageant by BASF. This material has both a strobilurin (the equivalent of Insignia) and a fungicide called boscalid, an active ingredient that we have not had for ornamentals before. The combination of these two ingredients creates an extremely broad spectrum of control for foliar diseases and may in some cases provide synergistic control. More research and grower experience will soon tell us which diseases will be particularly well subdued by Pageant.

From the makers of the bactericide Phytan 27, there is also Xerotron-3. This is a hydrogen peroxide + peroxyacetic acid + octanoic acid material for disinfection and other aspects of disease management. Another product, OHP's Fenstop, is still new to much of the industry: This fungicide provides good control of downy mildews, foliar Phytophthora and related pathogens, with spray and drench applications labeled.

But there also have been some relatively subtle changes. For example, the previous Rhapsody, a *Bacillus subtilis* biocontrol marketed by AgraQuest, is now being brought to you by BioWorks under a new name: Cease. Tests are under way to further explore the efficacy of this biofungicide for both root and foliar applications against both fungi and bacteria. Likewise, OHP has acquired Veranda O from Arysta for use against Botrytis, Alternaria and Rhizoctonia. (This product was previously tested under the name Endorse).

**Joyce Latimer:** One of the biggest developments in PGRs this past year is that the Chemtura products B-Nine and Paczol are now marketed by OHP, Inc. Most of the other new developments in PGRs this year have been in labeling. Only Tiberon (cyclanilide, OHP) is a new chemistry labeled for ornamentals, specifically to enhance branching of woody ornamentals. Tiberon is an auxin transport inhibitor, which allows lower plant buds to develop or be released, resulting in a thicker, fuller plant.

OHP has also expanded the label for Cycocel to permit outdoor application to containerized plants (see the label for application details). Fine Americas, Inc. introduced Abide (ancymidol) and Citadel (chlormequat chloride) and received EPA approval for an expanded label for Configure (6-BA) that allows its use on a wider range of ornamentals. SePRO Corp. introduced a low-odor formulation of Topflor.

[PGR company reps and growers] agreed that cutting production costs and maintaining profitability were the greatest challenges that growers are facing as they plan for the coming year.

**Ray Cloyd:** The biggest new developments in terms of arthropod (insect and mite) pest management has been the introduction of the Valent's insecticide Overture. This insecticide has activity on western flower thrips (*Frankliniella occidentalis*), which is important because the effectiveness of spinosad (Conserve) appears to be diminishing because of its extensive use since its introduction. In fact, in August 2008, Dow AgroSciences voluntarily suspended the sale and use of all spinosad-related insecticides in two counties in Florida (Broward and Palm Beach County) because western flower thrip populations had developed resistance to insecticides containing spinosad as the active ingredient. The active ingredient in Overture is pyridalyl, which is supposed to have a different mode of action than spinosad. The insecticide is slower acting (taking about six days to kill thrips) than spinosad but does have efficacy — 80 to 90 percent — against western flower thrips based on our trials. The availability of an insecticide with a different mode of action than spinosad

## At the Table

**James Bethke, pests**  
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**Ray Cloyd, pests**  
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**Margery Daughtrey, diseases**  
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**Joyce Latimer, PGRs**  
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**Jim Barrett, PGRs**  
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## greenhouse chemical trends

is important so that this can be included in rotation programs.

The other new development has been the introduction of lures for thrips, which contain a sex aggregation pheromone. These lures are designed to coax thrips out of hiding places such as flowers and increase their exposure to either insecticide spray applications or natural enemies. This also increases the sensitivity of monitoring for thrips. In other words, "low" thrips populations may be detected much

earlier than using either a yellow or blue sticky card without a lure.

**Jim Bethke:** I think one of the most notable [developments] is the interest in how well the softer products (natural products, biopesticides, IGRs, neem, Bt, etc.) do against major pests compared to more conventional products. There are still very few new development products coming down the line.

As expected, there has been an increase in resistance levels in western flower thrips and more indication of resistance to Conserve (spinosad).

In my area, there is an increase in the conundrum of the need to "reduce the pesticide use" and the "mandated treatments for eradica-

tion or quarantine pests."

**Jim Barrett:** The introduction of generic or postpatent products has continued with the introduction of Citadel and Abide. Now there are multiple products for all of the anti-GA height control chemicals, with the exception of Topflor. OHP has developed Tiberon to promote lateral branching, and it is initially labeled for trees and shrubs. Tiberon is an auxin transport inhibitor and is different from all the other branching products. Fine is expanding the use of Configure (6BA), and there is considerable interest in finding additional uses on perennials and annuals.

### What is the biggest general challenge facing growers in the coming year?

**Margery Daughtrey:** For those who produce basil along with their flowers, the new downy mildew disease — a *Peronospora* species — creates a huge control challenge. The question is what can control it, or, more importantly, what is labeled for use against downy mildew on basil in greenhouses? Precious little.

**Joyce Latimer:** [PGR company reps and local growers] agree that cutting production costs and maintaining profitability are the greatest challenges that growers are facing as they plan for the coming

year. However, many growers are interested in using PGRs to assist in reducing costs while still maintaining a high-quality product. The current conditions have not resulted in less PGR use. Along the lines of determining costs of production, the Plant Growth Regulator Rate Calculator was updated in 2008 by Brian Krug of the University of New Hampshire and Brian Whipker of North Carolina State University and is available at [www.floricultureinfo.com](http://www.floricultureinfo.com). It is an Excel-based calculator that allows you to determine the amount of chemical required for your PGR applications and the cost of that application using your own chemical costs as inputs.

**Jim Bethke:** We, as scientists and extension agents, recommend a good rotation of chemical active ingredients (AIs) for best control practices. However, more AIs are being removed from the market and fewer AIs are being developed. The options for control or for recommendation are so few in some cases that we don't have an answer or solution for the growers. I think western flower thrips and the leafminer are going to change some growing practices in the coming year. I have already had a grower that has given up on growing chrysanthemums. Another grower is rearranging his cropping cycle and



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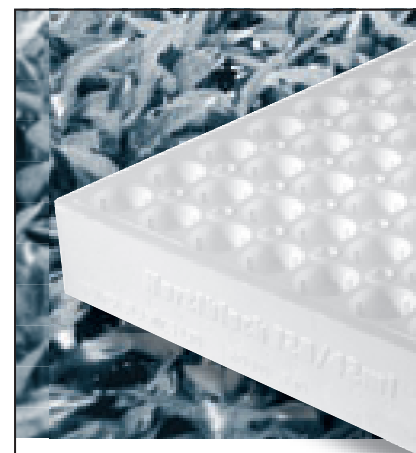
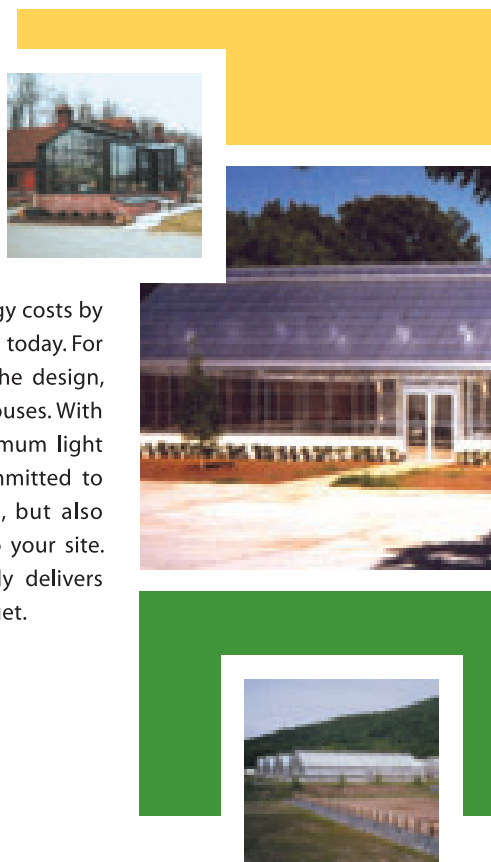
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switching greenhouses in which he grows certain plants. In addition, he is now seriously considering complete exclusion screening. We've recommended that practice for a long time, but the situation has finally reached the pocketbook enough that the grower is taking it seriously. This is also affecting field-grown crops that are susceptible to thrips vectored tomato spotted wilt virus (TSWV). Up and down the state this past year, there are reports of serious losses because of TSWV. I think this will have a serious effect on next year's crops as well.

Another challenge is the influx of so many generics. Yes, they are cheaper, but are they as effective and are the growers careful in making sure they are rotating among the different chemical classes?

**Jim Barrett:** In the area of growth regulators, the biggest challenge is being very consistent, using the chemicals effectively and not making mistakes that are costly.

### What are the biggest production concerns for growers implementing new strategies using these chemicals?

**Margery Daughtrey:** Growers are increasingly aware of the need to save pennies in all facets of production — but choosing less-expensive fungicides often means choosing the less-effective ones.

**Joyce Latimer:** The biggest production concerns for growers using PGRs are having trained PGR applicators who can obtain consistent results, and having established application rates for the crops in question. However, growers are still seeking — and are willing to test — new application methods like liner or bulb dips or chemigation techniques that reduce crop handling and therefore reduce labor needs and production costs.

**Jim Bethke:** Using softer chemicals will require more applications so that the products remain effective. It will probably be more costly to monitor and maintain control of common pests. I think they will have to pay more attention to the crops.

**Jim Barrett:** Growers are looking for PGR uses and strategies that reduce production costs and reduce risks. However, learning the new products and techniques requires an investment of time and space. Then, gearing up the new practice, from small-scale trials to

wide use on crops, needs to be managed to reduce the risk of errors.

### Has the economy had an impact on how growers purchase and use chemicals?

**Margery Daughtrey:** Horticultural suppliers are not stocking as many choices for growers — and may be hard pressed to provide the ideal fungicides when emergencies arise.

**Joyce Latimer:** Of course it has! Growers are looking for the lowest-cost alternatives to meet their PGR needs, in terms of chemical choices and purchase options as well as application methods.

**Ray Cloyd:** The obvious concern among greenhouse producers is dealing the costs of "everything" associated with the price of oil (e.g. pots, fertilizers, etc). Because of the financial situation, I have found that greenhouse producers are trying to deal with insect and mite pests with their existing arsenal of pest-control materials without having to purchase additional, more expensive products. Greenhouse producers have actually e-mailed me their listing of pest-control materials and inquired if they can control specific insect or mite pests with their existing products, yet still implement rotation programs to reduce the possibility of resistance.

**Jim Bethke:** Absolutely! There have been several impacts: First, some products are not readily available because of their effect on agricultural chemical producers. Second, growers recognize the economy will have an effect on purchase of next year's crops, so they are compensating in all areas. Third, they have always been careful in chemical use because



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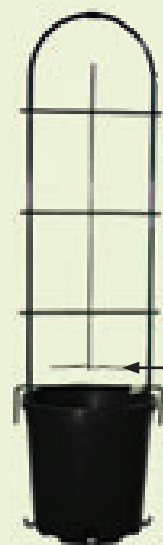


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PGR use is still an art, not just science. Nothing replaces experience and home-based trials.

of costs, but I have seen a marked reduction by some growers in preventive applications with expected results, such as crop loss and panic. I've seen this in normal years when a grower is trying to save a few bucks, but this is more notable.

**Jim Barrett:** The costs of inputs have increased across the board and generally growers have had to absorb most of those increases. In terms of PGRs, many growers are willing to learn new techniques (such as drench applications) to reduce the total amount of chemicals used. In many cases growers are using more PGRs to reduce labor requirements.

### What developments do you predict for 2009 and further into the future?

**Margery Daughtrey:** We're going to keep seeing new disease problems because of the importation of cuttings from offshore.

**Joyce Latimer:** Several PGR companies plan to continue research in determination of rates, especially for the new cultivars hitting the floriculture market. But they also plan on additional research and development work both within their companies and in university trials. Fine Americas is working on new products like ABA (abscisic acid) and novel formulations of some their existing products. Valent Biosciences Corp. (VBC) has been evaluating s-ABA (abscisic acid [VBC-30074]) to enhance crop shelf life under commercial conditions with a three-year experimental use label. Commercial registration is expected in late 2009. I expect to see additional work in application methods and improved efficiency in the use of all PGRs in 2009.

**Ray Cloyd:** Many greenhouse producers have inquired about the use of biological control or natural enemies (e.g., parasitoids, predators, and beneficial nematodes) to "control" their array of insect and mite pests. This really has nothing to do with being organic or sustainable, but I think is associated with evaluating alternative pest management strategies and not solely relying on pest control materials.

**Jim Bethke:** I think there will be an even greater push toward the use of safer/softer/natural products. There are some obvious uses for this class or group of chemicals, such as neem as an IGR and repellent, or soaps and oils to control scale crawlers. Unfortunately, I don't think we have enough data yet to exclude conventional synthetic pesticide use in ornamental production. Ornamentals are an aesthetic crop; as such, there is a need for very good, effective pesticides. In addition, most of the current conventional products — that is, chemical synthetic pesticides — are quite safe to mammals and beneficial arthropods. They are given a bad rep because they are synthetic.

**Jim Barrett:** The development of new PGR applications for promoting branching will continue as the industry learns more about these products. There also will be more interest in using products to reduce leaf yellowing (see the Ask Us column in this issue). An area that will expand rapidly will be the use of PGRs or other products to reduce shrink in retail because of drought stress. There are products currently on the market that need further evaluation. Development of ABA is continuing and it is on track for introduction in early 2010.

### Anything else you'd like to share with GPN readers?

**Margery Daughtrey:** The industry could use a more nimble process for expanding existing fungicide labels. And the industry could use organic and biological control remedies with greater punch.

**Joyce Latimer:** PGR use is still an art, not just science. Nothing replaces experience and home-based trials. **GPN**

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