

crop cultivation

Finishing Bedding Plants and Perennials

With spring over, it's time to look back at this year's top five production problems.

By Roger C. Styer



Photo courtesy of Proven Winners

Now that the 2003 spring season is behind us, it's time to recap problem areas. Working with my clients and traveling around the United States giving talks, I can narrow down the number of areas that need work to five. There are obviously more cultural problems that need attention, but my top five encompass the growers' greatest concerns. These top issues are where I spend most of my time with clients.

INSECTS AND DISEASES

Growers seem to be battling insects and diseases every year, regardless of how many newer and better chemicals come onto the market. For insects, it boils down to scouting, sticky cards, sanitation, using the right chemicals and getting good chemical distribution during application. I have a hard time convincing growers to stay up on their use of sticky cards and scouting.

Thrips continues to be the number-one insect problem. Yellow and blue sticky cards placed two inches above crops are the first line of defense. Put sticky cards in basket lines as well, since thrips will probably show up there first. Use sticky cards to determine where you have thrips and how well your chemical applications are working. Sticky cards will also work well with whiteflies, fungus gnats and shoreflies. For all other insects, you need to scout susceptible crops on a weekly basis.

Fungus gnats and shoreflies have long been considered simply nuisances but are now being recognized as pests worthy of control. Adults of both pests can spread various root and crown rot diseases. Larvae of fungus gnats can feed on tender roots of many crops, especially poinsettias, cyclamen and Easter lilies. Control of these two pests can be difficult, as they like moist conditions with algae and decaying organic matter to feed on. Use the down time between crops to treat floors for larvae and pupae, using Adept, Distance, lime, rock salt, Hypoaspis mites or Atheta beetles. Best control is by sponching or drenching to eliminate larvae within the crops, followed by ULV or autofog applications for adults. More growers are turning to biocontrols.

Control of whiteflies and aphids has generally been with Marathon drenches on susceptible crops, especially baskets and large pots. If not using Marathon as a preventative, plan on weekly sprays based on scouting. It is really embarrassing when your shipping people or your customers tell you that you have whiteflies or aphids.

Disease control must be based on moisture and humidity management, scouting, correct identification of disease, sanitation, weed control and close examination of all plant material brought into the greenhouse. I emphasize to every grower that they need disease identification books at their fingertips and a good diagnostic lab where they can get a quick, accurate diagnosis. Wet growing conditions, growing on the ground, poorly draining media and no air movement are great for root and crown rots, Botrytis and many other diseases. Make sure leaves are dry at night by using a dehumidification cycle at day's end, watering only in the a.m., having good air movement and keeping plants from overgrowing or growing pot-tight. Keep dead flowers from falling off baskets onto the crop below. Rogue out any diseased plants, and spray the rest for protection. Avoid reusing containers without proper disinfection, keep weeds out of the greenhouse and clean up after shipping or moving plants.

Make sure to rotate Subdue with Truban or Terrazole, as well as Aliette, for control of warm-weather Pythium and Phytophthora without resistance. Botrytis will always be a problem when the weather is wet and the greenhouse is full. Spray for Botrytis before the wet weather starts to get protection, as you will not be watering during the wet weather. Use Decree (with Capsil), Medallion or a low rate of Phytan 27 when flowers are showing, and Daconil, Chipco 26GT and Heritage when plants are green. Downy mildew causes great headaches on the West Coast during the rainy season, affecting alyssum, pansy, stock and especially snapdragons. In Florida, there is a downy mildew that attacks *Salvia splendens* only. For handling fungal and bacterial leafspots, you must know what you are dealing with before you can spray, as no one chemical controls all of those leafspots. ♦



These impatiens have recently been drenched with Bonzi, allowing them to continue to flower but not stretch. (Photos courtesy of Roger Styer)



Varieties such as 'Purple Wave' (right) need long days to flower and are not receptive to photoperiod until five leaves are expanded.

crop cultivation

Viruses can cause late and serious problems on certain crops, not showing symptoms until plants are under stress or starting to flower. Send any suspicious samples for diagnosis.

Figure 1, starting on page 122, contains a list of recommended

fungicides and insecticides. These chemicals are working for growers, but there are more chemicals labeled than what is on this list. For pests such as thrips, rotate after two applications of a chemical, and use three different chemical classes and modes of action. For mites, rotate



The source of the rooted cutting in this instance is what caused the size difference.

with each application. Remember, the more often you spray for a pest, the more you need to rotate. Use autofog, ULV or other types of foggers to get better chemical distribution, especially if you produce a lot of hanging baskets. Sprays can also be effective, but you must get coverage under the leaves. For Botrytis, make sure to rotate with each application. Use monthly drenches for root and crown rots. More growers are turning to biocontrols such as Rootshield and Companion for control of root and crown rots. With most diseases, protective spraying should be practiced on susceptible crops and when the weather is conducive for disease spread. Virus-infected plants can only be dumped.

CUTTING QUALITY AND FLOREL

With more and more vegetative annuals being produced, growers are becoming more reliant on unrooted and rooted cuttings. Almost all of these cuttings come from off-shore locations selected for proper environment and cheap labor. However, these locations can also have problems with worker training, insects and diseases, water quality, shipping and order fulfillment. Transferring to rooted cuttings will not alleviate the problem, as the unrooted cuttings that the rooting stations use come from off-shore locations.

The biggest problems I see with cuttings are lack of uniform standards (size of cuttings, number of nodes, etc.), disease problems, gassing of cuttings when insects are found, shipping time, temperature control and pinching of rooted cuttings. The image above shows three different size plants of 'Freedom Red' poinsettias grown from a rooted cutting in the same greenhouse with the same culture. What causes the difference in finish size is the

crop cultivation

source of the rooted cutting. Small, thin cuttings will have less vigor and require less growth regulators to finish. Recent problems with diseases, such as *Ralstonia* and TMV, reinforces the problem with imported cuttings.

An area I think needs more attention is the use of Florel on cuttings during propagation. I published an extensive article on Florel in the October 2002 issue of *GPN*. Florel used on cuttings after they start to root will increase branching with or without pinching, will

cause disbudding or delay flowering in many crops, and will control early stretch. Rooting stations could use Florel before they ship the rooted cuttings to other growers, who would then benefit from the greater branching whether they used Florel again or not. For best

results with Florel, ensure water pH in the spray tank is less than 5.0 after adding Florel, spray to run-off, avoid spraying plants under stress and keep leaves moist for 3-4 hours. Use Florel around the time you would pinch, and determine how long your reblooming time will be for each crop. For geraniums and summer torenia, it may be 6-7 weeks, while other crops will only be delayed 2-4 weeks.

FLOWERING TIMES

Growers in many parts of the country are being asked to have perennials and many annuals in flower well before their natural season. This is especially true in California, Arizona and the Southeast. Perennials are being scheduled to flower the first year and sold at the same time as bedding plants in the Midwest. Wave petunias need to be in flower in February and March in the warmer parts of the country. However, varieties such as 'Purple Wave' need long days to flower and are not receptive to photoperiod until five leaves are expanded. This means growers must light plugs and liners to get crops such as Purple Wave to flower earlier. Other long-day annuals include lobelia, other petunias, *Salvia farinacea*, some pansies, ageratum, some portulaca, some snapdragons and tuberous begonia. On the other hand, I see growers having problems with short-day plants such as cosmos flowering too fast and being too short early in the season, but then growing too tall while waiting for flowers later in spring. The same problem can happen with *Zinnia elegans* and African marigolds.

I see more and more growers lighting plugs and liners for photoperiod than ever before. (See page 32 for more information on lighting.) Even plug producers in Southern California and Florida are lighting certain crops to provide a faster flowering plug for some customers. We are finding out that certain vegetative annuals are also long-day flowering and should be lit in the propagation stage or shortly after potting.

To get perennials to flower on time in the spring, growers must use vernalization, photoperiod or a combination of both, depending on the crop. Seed companies are offering first-year flowering varieties. ♦

crop cultivation

The big question is — What does your customer want?

GROWTH REGULATORS

This is probably the number-one topic I cover with my clients! It's not just a matter of which growth regulator to use on which crop, but what method of application is best. Growers are learning about the differences between sprays, sponches and drenches. I wrote an extensive article on growth regulators in the March 2003 issue of *GPN*, complete with starting rates for sprays and drenches. I think all growers are familiar with sprays, but uniformity is still difficult with Bonzi and Sumagic. Tank mixes are being used more often. Most common is B-Nine + Cycocel, but some growers are using B-Nine + A-Rest (especially on fall pansies) and B-Nine + Bonzi or Sumagic. You can get more activity from tank mixes than either chemical alone. Tank mixes are especially useful on perennials.

Plug growers everywhere are learning how to do sponches early in a crop to keep it from stretching. You can use A-Rest, Bonzi or Sumagic, as all of these chemicals are active in the soil through the roots. By using this early sponch, you will have to do fewer sprays later on. Crops most likely to be sponched early include cosmos, zinnia, marigold, snaps, celosia, dianthus, dahlia, pansy, impatiens and even *Salvia splendens*.

Most growers are, however, using drenches, either early or late in the crop. The image on page 116 shows impatiens baskets that have recently been drenched with Bonzi, allowing the plants to continue to flower but not to stretch. Drenches are typically applied when plants are up to saleable size and starting to bud or flower. A late drench of A-Rest, Bonzi or Sumagic will not delay flowering, but a late spray may. Containers need to be moist before drenching, and large containers such as hanging baskets should have a known volume of chemical applied per container. This can be done through an Echo system, Chemdoser (Dramm), portable injector and counting or by cup. However, to drench 4-inch pots

Figure 1. Short list of recommended fungicides and pesticides.

DISEASE	CHEMICAL
Bacterial Leafspots	Camelot, Kocide, Junction, Phytan 27
Botrytis/Sclerotinia	Chipco 26019 (26GT), Daconil, Exotherm Termil, Decree, Heritage, Medallion, Phytan 27
Downy Mildew	Aliette, Heritage, Stature
Fusarium	Heritage, Medallion, Terraguard
Fungal Leafspots	
Alternaria/ Curvularia	Chipco 26019 (26GT), Daconil, Dithane, Manzate, Protect T/O, Heritage, Medallion, Stature, Zyban, Spectro, Junction, Systhane, Terraguard
Anthracnose	Heritage, Junction, Kocide, Phytan 27, Zyban
Cercospora	Heritage, Junction, Spectro, Zyban, Medallion, Strike, Systhane, Terraguard
Colletotrichum	Heritage
Mycosphaerella	Daconil, Spectro
Myrothecium	Heritage, Medallion
Phomopsis	Kocide, Junction
Septoria	Heritage, Junction, Spectro, Zyban, Medallion
Powdery Mildew	Pipron (eradicant only), Heritage, Compass, Rubigan, Phytan 27, Strike, Systhane, Terraguard
Pythium/Phytophthora	Aliette, Heritage (Aerial Phytophthora), Stature (Aerial Phytophthora), Subdue MAXX Truban, Terrazole
Rhizoctonia/Sclerotium	Cleary's 3336, Fungo, Systec 1998, Contrast, Heritage, Medallion, Terraclor (not with seedlings)
Rusts	Banner MAXX, Daconil, Heritage, Compass, Strike, Systhane, Terraguard
Scab	Heritage, Compass, Dithane, Manzate, Protect T/O, Stature, Systhane, Terraguard
Thielaviopsis	Cleary's 3336, Fungo, Systec 1998, Terraguard, Medallion
INSECT	CHEMICAL
Aphids	Closure*, DuraGuard, Duraplex, Endeavor, Marathon, Marathon II, Orthene + Talstar or Tame, Thiodan
Caterpillars (Worms)	Conserve, Decathlon, Dipel, Thiodan
Fungus Gnats/Shoreflies (Adults)	Attain TR, Talstar, Decathlon, Duraplex, Knox-Out*, PT1100 Pyrethrum, PT1300 Orthene, Thiodan
Fungus Gnats/Shoreflies (Larvae)	Adept (not labeled for poinsettias), Azatin, Ornazin, Citation, Distance, DuraGuard (not on plugs), Enstar II, Knox-Out*, Marathon, Gnatrol (fungus gnats only), Nemasys (fungus gnats only), Hypoaspis mites (fungus gnats only), Atheta beetles (fungus gnats and shoreflies) ▶

Write in 765

crop cultivation

and flats, you need to apply the growth regulator like you are feeding, making sure to get 10-percent run-through. This is easily done through portable injectors.

Once you get the hang of applying drenches, you start doing an earlier drench rather than a spray. Reasons for this include the length of control and no overspray onto sensitive crops. Remember, a drench should allow the plant to grow out in 2-3 weeks. If not growing out, you applied too much chemical. Get out the Pro-Gibb and spray at 3-5 ppm or feed with more NH_4 fertilizer. If not holding for at least one week, you applied too little chemical. Either increase the ppm used or the volume applied.

A new technique being worked out is a liner dip, where the vegetative liner is dipped in A-Rest, Bonzi or Sumagic before being potted. This should control growth for 2-3 weeks. A final drench may still be needed in 4- to 6-inch pots. Liner dips will work best in combinations where you have vigorous and non-vigorous varieties growing together. Sprays and drenches are impractical on many combos, as you will overcontrol the non-vigorous varieties.

INSECT	CHEMICAL
Leafminers	Avid, Citation
Mealybugs/Scale	Azatin, Ornazin (mealybugs), Closure*, Distance, Decathlon, DuraGuard, Duraplex, Enstar II, Horticultural Oil, M-Pede, Marathon, Marathon II, Triact 70
Mites	Akari, Sanmite, Avid, Tetrasan, Floramite, Hexygon, Ovation
Thrips	Avid + Talstar, Tame, Azatin or Ornazin, BotaniGuard, Naturalis-O, Conserve, Mesurol, Orthene + Talstar or Tame, Pedestal, Thiodan
Whiteflies	BotaniGuard, Naturalis-O, Distance, Endeavor, Marathon, Marathon II, Orthene + Talstar or Tame, Pedestal, Thiodan


* Chemical off the market, use existing supplies only.

** Note: Not all fungicides and pesticides listed here are labeled for all ornamental crops. Test-spray a few trays or flats and look for phytotoxicity symptoms after a few days, before applying the fungicide or insecticide to the whole crop. Rules for chemical usage vary between different states. Always read and follow label directions, and use proper precautions in applying chemicals. The information presented here does not constitute an endorsement of particular chemicals over others, only what seems to work the most effectively for growers. There are many other chemicals labeled for the above diseases and insects which can also be used.

COMBINATIONS

This is the area in the market with the most growth potential, but one which is getting abused by poor selections and shipping. Combinations can come in many sizes and shapes, with the most attractive being done in large containers. This product allows you to manipulate shapes, colors and textures to produce a combo that will thrive all season. Design combos for sun and shade. Look into the latest color trends. Get good ideas for combos from cuttings and seed suppliers, as well as books, magazine articles and your workforce. Develop a menu of combos, and offer to customize.

The biggest problem is not what combos to put together, but how to control them once put together. Wholesale growers have this problem with the big box stores. You cannot let combos get too big or they won't ship. Since most combos are put together early with liners and plugs, you need to understand which plants need controlling and which do not. Use Florel, pinches and liner dips for vigorous varieties before putting into the combo. Some combos can still be drenched at the end with A-Rest, Bonzi or Sumagic, but make sure there are no slow-growing varieties in that combo. Design carts or racks that can deliver containers in one piece.

Well, there you have it, my top five issues for this past spring. I imagine many of you can relate to these five items. And probably next spring, I will still be spending most of my time on these issues, as will you. Here's hoping we keep learning every year and making fewer mistakes! 

Roger Styer is president of Styer's Horticultural Consulting, Inc., Batavia, Ill. He can be reached by phone at (630) 208-0542 or E-mail at carleton@voyager.net.

LearnMore

For more information related to this article, go to www.onhort.com/LM.CFM/gp070309