November/December 2004 • NUMBER 887

ofa™ Bulletin
an Association of Floriculture Professionals

Scheduling Quart Production of Perennials

by Michael Cunningham

Every grower of quart perennials faces the problem of limited shelf life. Most perennials, when grown in these small pots and crowded in flats, are saleable for only three to four weeks, and yet we sell quarts for at least 12 weeks. The trick is to find some way to have good quality plants available whenever there is demand for them. In spring production, once the plugs are planted in quart pots, they begin to root in. As they root, the top portion of stems and leaves begins to grow. At some point during the period of rapid growth, we consider the plants saleable.

Soon, however, they begin to crowd each other, which leads to a natural and unavoidable response – stretching. When stretching has spoiled the presentation of the plants, they are no longer saleable. This may sound rather abstract, but it becomes quite real when you are pulling orders. Someone wants to buy a flat of lamium 'Purple Dragon,' and inventory shows that there are several flats left. When you find them, they look a little tall but OK. But then when you pull one flat out from the others, you discover that the plants are actually a foot tall; and, having no strength in their stems, they flop all over the place. What's more, the moisture that surrounds the thicket of stems and decaying leaves has been an ideal breeding ground for Botrytis, which is turning your plants into slime. When this happens, "Who you gonna call?"

There are two ways to address this problem: by trying to extend shelf life so plants have more chance to sell before they become unsaleable, or by trying to schedule production in smaller batches timed to shortened sales periods within the season. Growers have various techniques for extending shelf life. First, they can slow the growth rate of the

Continued on page 7

Building Your Effective Marketing Plan

by Gary Hudson

Your business, be it large or small, needs to have a marketing plan. My task today is to share with you the basic components of a marketing plan and how to build a plan that fits your needs and utilizes all of your current strengths.

Editor's Note: This is the content of a presentation made by Gary Hudson at the 2004 OFA Short Course. For an audio CD of this presentation and others at the OFA Short Course, visit the OFA Web site at www.ofa.org and review the CD-ROM information provided by Digitell Inc.

An effective marketing plan doesn't have to be expensive, but it must be organized, timely, and consistent.

The "M" Word

The "M" word – marketing – is different than the "S" word – sales.

Continued on page 11

November/December 2004

ofa Bulletin

OFA Mission Statement
To support and promote floriculture professionals through lifelong learning, career enhancement, and public awareness.

OFA – an Association of Floriculture Professionals
2130 Stella Court
Columbus, Ohio 43215-1033 USA
614-487-1117 Fax: 614-487-1216
e-mail: ofa@ofa.org
home page: www.ofa.org

OFA Bulletin
November/December 2004
NUMBER 887

Editorial Staff
Stephen A. Carver
Cheryl Cuthbert
Michelle Gaston
John R. Holmes, IOM, CAE
Executive Director
Peter Konjoian
Technical Advisor

Contributors
Michelle Bell
Raymond A. Cloyd
Michael Cunningham
Jennifer H. Dennis
John Erwin
Gary Hudson
Joanne Kick-Raack
Peter Konjoian
Harold Lloyd
John Wargowsky
Walter Wohanka

Published Bimonthly

America® in Bloom
© 2001-2002 America in Bloom

Announces Contest Winners

by Laura Kunkle

Winners in eight population categories were announced at the third annual America in Bloom (AIB) Symposium and Awards Program on Saturday, October 9, at the Hyatt Regency at State Capitol, Indianapolis, Indiana.

The event was hosted by the city of Indianapolis, which won AIB's 500,001-1,000,000 population category last year. As the nation's 12th largest city, Indianapolis shared with attendees the story of its dramatic revitalization, as well as its gardens, arts and culture, sports and recreation, history and heritage, and time-honored traditions. Indianapolis offers a balance of big-city style and small-town charm.

AIB is a national campaign and contest that promotes enhancing communities through beautification. In the friendly competition, communities are matched by population and evaluated on their efforts related to floral displays, urban forestry, landscaped areas, turf and groundcover, tidiness, environmental awareness, heritage conservation, and community involvement. Judges visited the communities this summer.

Nearly 35 communities from all regions of the country participated in the third edition of AIB.

5,000 or Less Category
Rancho Santa Fe, California

5,001 – 10,000 Category
Goshen, New York

10,001 – 15,000 Category
Greenfield, Indiana

15,001 – 25,000 Category
Hershey-Derry Township, Pennsylvania

AIB's 2004 Population Category Winners

Six special awards were presented to communities which received high marks out of all contestants in all population categories. (shown in bottom 4 pictures)

25,001 – 50,000 Category
Sandusky, Ohio

50,001 – 100,000 Category
Fayetteville, Arkansas

100,001 – 300,000 Category
Naperville, Illinois

University Campus Category
Utah State University

Ball Horticultural Co. Floral Displays Award – Newburyport, Massachusetts, presented by Dr. Marvin Miller, Ball Horticultural Co.

Proven Winners Landscaped Areas Award – Rancho Santa Fe, California, presented by Delilah Onofrey, Meister Media Worldwide on behalf of Proven Winners.

American Horticultural Society Community Involvement Award – Vernal Utah, presented by Raymond Carrière, Communities in Bloom on behalf of Katy Moss Warner, American Horticultural Society.

The Scotts Co. Turf & Groundcover Areas Award – Hershey-Derry Township, Pennsylvania, presented by Lee Levenson, The Scotts Co.

Continued on page 4

America in Bloom Announces Contest Winners

Continued from page 3

Hirons & Company Communications Heritage Conservation Award – Goshen, New York

Gardens Alive! Environmental Awareness Award – Kalamazoo County, Michigan

Laura Kunkle, America in Bloom, Claudia Thompson-Deahl, Reston, Virginia and Delilah Onofrey, Meister Media Worldwide. Reston,Virginia, International Challenge (Medium Category) Champion at the Communities in Bloom Awards, Charlottetown, PEI, September 18, 2004.

John Holmes, OFA - an Association of Floriculture Professionals presenting AIB Awards to Utah State University, Utah, and Greenfield, Indiana.

To get your community involved, here are some things you should do:

1. Get approval of your mayor, city council, or responsible municipal department and complete the registration form.
2. Organize a local AIB contest committee comprised of representatives from businesses, municipality, and private citizens.
3. Review judging criteria and documents received from AIB upon registration. Create notebook of year-round events in the community that relate to the evaluation grid criteria. Develop plans for recording ongoing events. Develop plans for those grid areas the community is not addressing. Borrow ideas for local contests from AIB.
4. Spread the word about the competition. Get the community press involved to raise excitement throughout the process. Use media kits from AIB.
5. Enjoy the time the judges are in your community.
6. Plan to attend the educational symposium and awards ceremony in the fall.
7. Make it fun and enjoy the journey!

For more information on America in Bloom, contact Laura Kunkle at LKunkle@ofa.org or 614-487-1117.

Understanding and Evaluating Guarantee Programs

by Jennifer H. Dennis

The Idea Behind Offering Guarantees

Small- to medium-sized retail businesses may wonder how they can maximize value and increase repeat patronage. One solution is to build a relationship with customers by increasing their confidence in the products that are offered by providing plant guarantees. Many of the mass merchandisers such as Lowes are offering a one-year guarantee on selected plant material. While a few horticulture retail businesses offer some type of remedy for their customers, some businesses still debate whether guarantees are worth the effort. This article provides research results and marketing theory to show why plant guarantees may be worth implementing.

There are many reasons that guarantees should be considered within a retail operation, including building consumer confidence of product quality and creating an atmosphere where the retailer's commitment to the customer is shown. Marketing is based on relationships between the buyer and seller. In this case, the implementation of a guarantee program establishes a relationship between the customer and retail business indicating a commitment to stand by the plant material sold. Providing a remedy for a failed product or an unsatisfactory expectation may provide goodwill with the customer, thus creating a trusted relationship. Showing customers they are appreciated after the sale and not just when handing over discretionary income is sure to build a positive relationship with customers and a way to build repeat patronage.

Most consumers realize at least some risk is involved when they consider buying any product or service. Many companies use demonstrations or samples to reduce consumers' risk with products that need to be experienced before an evaluation can be made. For products such as clothes, some customers can evaluate different characteristics and attributes associated with the product. In other instances, evaluating products are hard to do. This is certainly the case with gardening products. Besides putting plant material in display gardens, there are few other alternatives that show consumers what they are getting or how the plant material will perform once they put it in their own gardens. Selling an "experience good," one that cannot be evaluated immediately, lends itself toward using signals that help consumers make better choices about plant products. Consumers may use these signals to increase their odds for success. Past researchers have determined several signals that can decrease the risk associated with buying products. The major cues that signal quality and infer performance are brand name, price, warranties, and money-back guarantees.

Decreasing Risk

Brand Name

Many products carry a brand name or promise to deliver the same quality product each and every time. Repeat customers of brands have already taken the risk of initially buying the product, and they liked what they got. First-time users rely on other cues, such as reputation of the product and outside recommendations from people they trust.

Price

Price also serves as a signal of what a customer might expect to get from a certain product. When all else remains equal, many customers perceive a product with a higher price to be of higher quality.

Warranties

Consumers want their purchases to work or perform. They want the products they buy to meet a high standard. When there is risk or doubt, consumers may choose not to buy. Signals such as warranties help convince the consumer to make the purchase. Research has shown that consumers view products with warranties more favorably because they reduce the consequences of failure.

Money-Back Guarantees

Guarantees serve as another cue for customers to make the right decision. Guarantees are differentiated from warranties because the latter cover longer time periods (three to five years), often are used for repairs or replacements, and do not involve refunds. Money-back guarantees are short-term remedies that offer a full or partial refund in a short amount of time, usually less than 30 days. Guarantees can be used by customers to differentiate products or retailers, provide a means for decreasing risk with certain products, and provide a supplement to signal quality attributes about the particular product.

Do Plant Guarantees Work?

Researchers at Michigan State University conducted a study recently to explore the effect of plant guarantees (a signal) on consumers' intention to repurchase. This study showed that plant guarantees mattered for gardening products. Researchers conducted an Internet survey of gardening consumers to examine the difference in satisfaction and regret experienced when consumers were offered guarantees versus when no guarantees were provided. A total of 777 responses were received, with participants ranging in age from 18 to 78 years of age. The typical respondent was female, college educated, with a middle-class income. Respondents throughout the United States participated, with 46 percent residing in the Midwest. The largest number of responses came from Illinois (18 percent), Ohio (17 percent), and California (17 percent).

Consumers were asked to report on one of three products (hanging baskets, 1-gallon perennials, or potted roses) that were bought during the spring or summer of 2003. Respondents were asked whether plant guarantees were

Continued on page 6

ofa Garden Center

Understanding and Evaluating Guarantee Programs

Continued from page 5

provided for these products. Fifty-six percent of respondents said a guarantee was offered for their particular plant purchased. Results from the survey indicated there were differences when guarantees were present or absent. When looking at hanging baskets only, the level of satisfaction associated with the gardener's overall experience with the hanging basket increased when a plant guarantee was in place. If the consumer's experience was bad (i.e. product failed to perform or product died) and he or she experienced regret about buying the product, but a plant guarantee was in place, the level of regret decreased and the consumers were more likely to repurchase a product from the retailer again.

This shows that although a bad experience occurred with the current product, the presence of a guarantee made consumers willing to return to that particular outlet. Increasing value and decreasing the level of regret experienced is important, because the behavioral consequence of regret is switching either from the product or retailer that provided the failed product. Two other products, potted roses and 1-gallon perennials, had different results from the hanging baskets, with almost no change in the level of satisfaction and regret when a guarantee was in place – showing that guarantees may not have the same effect for all products in the same way.

What time frame should be considered?

The difference between money-back guarantees and warranties is the separation of time. Businesses should be clear about the intent of their guarantee/warranty program. If the intention is to build a relationship with customers, a money-back guarantee, a warranty program, or a combination of the two may be needed to fit customer needs. Understanding the customer is the first step to creating a successful program. Often, retailers give more than what the customer expects. One of the key elements for making a guarantee program work is to know what the customer expects as a remedy. A plant guarantee should state a specific time in which the guarantee will be valid and under what conditions.

How should I evaluate my guarantee program?

Businesses may still be skeptical about implementing a plant guarantee program. However, a few guidelines may make implementation easier. Understanding and observing behavior of your customers will help to decide which program is the best fit. The Michigan State University study showed that not all plant material was affected the same by a guarantee program. Managers may want to evaluate which type of plant material may be suited for the guarantee program. For example, if your operation sells mostly annuals and perennials and few trees and shrubs, a warranty on perennials for one season and a money-back guarantee on hanging baskets may be sufficient. Retail operations may want to observe the type of plant material that is being returned by customers, create documentation for further evaluation, and plan their guarantee program accordingly.

Other points to consider include setting clear expectations and knowing what and why the customer wants to return the product. Upon starting a guarantee program, make clear what types of items may be returned for a refund and under what conditions. For example, the electronics store *Best Buy* has a return policy on most items sold in the store, with the exception of opened music and video games. There should be a time frame on annuals and hanging baskets or items that have the potential to go wrong quickly or have a short product life. Proper signage and the proper training with employees will add to the validity of the guarantee program. Employees should know which types of information should lead to replacement or a refund.

Editor's Note: Dennis received her Ph.D. in horticulture from Michigan State University. The research cited in this study is from her doctoral dissertation entitled "Happy Customers Buy More: An Investigation of Consumer Satisfaction and Regret of Three Horticultural Products."

Jennifer H. Dennis
Purdue University
Departments of Horticulture & Landscape Architecture and Agricultural Economics
320 Horticulture Bldg
625 Agricultural Mall Dr
West Lafayette, IN 47907
765-494-1352
Fax: 765-494-0391
jhdennis@purdue.edu

Scheduling Quart Production of Perennials

continued from page 1

plants by carefully stressing them: by lowering temperatures, running plants dry, withholding fertilizer, or applying growth regulators. Next, they can space the plants to postpone stretching. When these measures fail, growers can cut back or pot up the plants so that, after a period of recovery, the plants have a second chance to sell.

All of these techniques can have a good effect, but the goal of scheduling is to make them unnecessary. The basic idea is to plant each variety in successive batches timed for specific sales dates. Thus, the first batch might be timed for sales in late March and early April, a second and larger batch for late April and early May, and finally a slightly smaller one for late May and June. It is difficult, of course, to accurately predict demand; but when predictions are off, growers can bring out their bag of tricks for extending shelf life. One need not choose one approach over the other, for they are complementary.

There is one more way that growers extend the shelf life of perennials: by lowering their standards of what is saleable. I have several times heard a nurseryman, when selling a plant that is more or less unpresentable, say something like, "It doesn't matter what it looks like, you're buying a root system." There may be a good deal of truth to this claim, but it is still putting a good spin on a regrettable situation.

The Scheduling Thought Process

Having worked at a greenhouse for 10 years as a grower of annual bedding plants, and now for the last five years as a grower of perennials at a nursery, I see that the greenhouse grower has a different mentality than the nurseryman, especially when it comes to scheduling. And there are sound historical reasons for this difference. Typically, the greenhouse owner's parents started out as truck farmers, then built greenhouses for hothouse production of tomatoes and lettuce; then they or their children made the switch to growing annuals. Whether their product was a tomato or a flat of impatiens, they understood it to be a perishable commodity; and they thought about production in terms of weeks. The perennial nurseries typically started out in field production of trees and shrubs, then added or switched to containers. Their product was a potentially permanent landscape feature, and they thought of production in terms of years. When they added perennials to their product line, they adjusted their methods but kept the same basic mentality. Thus, when I started at Greenfield Plant Farm, the perennials we planted in gallons were expected to sell this year or next year, or even the year after. Even with the quarts, production was not targeted to specific sales dates. It was a one-shot deal: plugs were received in late winter and planted over the next several weeks, with sales expected anytime that spring or summer. My career at the nursery has been a five-year experiment in applying my bedding plant mentality to the growing of perennials. What follows is an account of what has worked.

Quart production is an important part of Greenfield Plant Farm's business. We grow more quarts than gallons and generate approximately a third of our income from them. When I came to work here in 2000, we produced 75,000 quarts of perennials; by 2004, that number had increased to 120,000 quarts. Greenfield Plant Farm started as a wholesale perennial nursery, and the owner built his reputation by offering a better selection than anyone else in the area. Since the newer and more unusual varieties were otherwise hard to come by, especially in quarts, Greenfield found a solid niche supplying local retailers. Now, I believe that production should follow demand; and since the wholesale demand for quarts was concentrated in a six-week period, the single-shot production I mentioned earlier worked reasonably well. Sales, which could be graphed as a bell curve, began in mid-March, peaked in April, and declined in May. By the latter part of May, customers wanted gallons only, no quarts. Ordering plugs for late February and planting them in quarts by early March gave us a product of good quality during the April period of peak demand.

As I said, production should follow demand; but since demand changes over time, production should also change in anticipation of changing demand. What changed for Greenfield Plant Farm was the emergence of a strong retail market. Ten years ago, the owner opened a retail store at the nursery but expected little to come of it. Then as the nursery's reputation spread by word of mouth among serious gardeners, retail sales increased; and by 2000, they were accounting for nearly half of all sales. By the time I arrived on the scene, the wholesale business was mature, with only modest potential for growth, but the retail business was still rapidly growing.

As soon as I understood the situation, I set about redesigning production to take advantage of this retail potential, and this effort required significant changes in the scheduling of quart production. Retail sales can also be graphed as a bell curve, but compared to the wholesale curve it starts later and lasts longer. The store opened the first week of April, and sales increased rapidly toward the end of that month, peaked in May, and then gradually declined through June, with a mini peak for the summer sale in July. With the single-shot planting schedule, the quarts were not at their best during the May peak, and in fact many of the more desirable varieties were sold out by that time. In other words, our quart production was not serving our own retail store as well as it might.

For the 2002 season, to get a better supply of quarts for our retail sales in May, I divided the plug order into two roughly identical orders and planted the second in late March and early April. Encouraged by the success of this change, I went to three plantings in 2003. And then, making further

Continued on page 8

Scheduling Quart Production of Perennials

continued from page 7

refinements, I went to four plantings in 2004. For instance, with salvia 'May Night,' we planted 540 plugs on each of four dates: February 16, March 8, March 29, and April 19. This is our best-selling salvia, and by planting substantial numbers at regular, three-week intervals, I hoped to have a continuous supply of saleable quarts.

Since we grow about 800 different kinds of perennials in quarts, it is impossible to find one plug grower who can supply all of them. One company in particular, however, grows a good portion of what we need, and I chose them as our main supplier. Of the 120,000 plugs we bought for 2004, Green Leaf Nursery supplied 70,000. These were divided between four shipments spaced three weeks apart, and the weeks were the same as those given above for salvia 'May Night.' They are the 8th, 11th, 14th and 17th weeks of the year, and I call them the A weeks. Terra Nova, at 30,000 plugs, is our second biggest supplier; and their three orders are scheduled for weeks 9, 12 and 15, which I call the B weeks. In addition to these two main suppliers, we have eight secondary and roughly six occasional suppliers. Shipments from them are scheduled mostly for the C weeks, i.e. weeks 10, 13, and 16. One benefit of having the schedule divided into A, B, and C weeks is that it helps me keep the plan in mind as the controlled chaos of spring arrives. But the real purpose is to have the plants we need when we need them.

Stages of Ordering

The process of ordering is complicated and time-consuming, but it can be broken down into four simpler stages. The first thing I do is compile a list of which perennials I want to grow and how many of each. We offer 800+ varieties in the quart size, but each year I consider dozens of possible additions. For items we already grow, I base the order on the quantity that sold in the past. For new items, I order according to how enthusiastic I feel about the plant. It is as unscientific as that. Each item has a designated supplier, and the quantity given is a multiple of the tray count the supplier uses for their plugs. The most common plug tray is a 72-count; thus the orders are for 72, 144, 216, 288, and so on. This stage of ordering is pleasant and carefree. It has the dreamy excitement of a shopping spree.

Eventually I finish the list and come up with the total number of plants I would like to order for quart production. It is then that the dream runs up against reality. I can grow only the number of quarts that I have room for, and thus the second stage of the process is one of reducing the order to what is possible for me to grow. We have five houses that are suitable and available for growing quarts. Each house holds 1,330 flats of 18 pots each (we differ from the industry standard in using an extra deep, 3 ½-inch pot for our quarts). Since each house holds 23,943 pots, my order is limited to 119,700 plugs. Twice in the last five years, we built an additional greenhouse to allow for an increase in quart production, but I don't get that luxury every year. The cutting down of the order that is required might be agonizing for some, but I rather enjoy fussing with numbers. My guiding principle has now changed from striving for greater variety to trying to arrange for the continuous availability of each item. Thus, I end up eliminating some varieties so we have a sufficient supply of the ones we do carry.

The third stage is where all the scheduling decisions are made, and it is the stage I am chiefly concerned with in this article. But before I get to stage three, let me jump ahead and briefly dispose of the fourth and final stage. After the initial orders are placed with the various plug suppliers, I begin to receive, almost on a weekly basis, confirmations and revised confirmations indicating shortages, cancellations, and delays. Knowing that we never get everything we order, I over-order initially by about 5 percent, and then add things if the cancellations amount to more than that. I also get word about desirable items becoming available that were not available before, and I add these to my order if possible. The orders thus stay fluid, and I never know exactly what I will get until I get it.

It is in stage three that I distribute the order for each item over the possible planting weeks. In doing so, I consider each variety separately and attempt to devise a schedule that is appropriate for each. A number of factors can affect these decisions. In the case of salvia 'May Night' mentioned above, I divided the whole order into four equal parts, 540 plugs for each of the A weeks. Such a schedule makes sense because 'May Night' sells well throughout the sales period. Even with plants that sell in smaller quantities, I tend to portion out the order evenly across the planting weeks, unless there is some reason not to. The varieties of dianthus, for instance, have the same sort of steady sales, as long as they stay in bloom. For well-known varieties, such as 'Bath's Pink' and 'Mountain Mist,' I might expect to sell 500 quarts, and would thus plant two trays of 72 on each of the four A weeks. For a new or unproven variety, two trays total might be enough, one for early (February 16) and one for late (March 29). For something more unusual still, like the small dianthus with the unappetizing name of 'Joan's Blood,' I might think one tray would be plenty; and I would plant it early so it would be ready for those adventurous gardeners who show up in early April looking for plants they haven't seen before.

Even just one tray of some items might be too much. I was worried that this was the case with 'Joan's Blood,' but I was proven wrong when most of them eventually sold. Other plants sink to my expectations. But just because I expect little demand for an item does not automatically disqualify it. If I think it is a worthwhile plant and will add to the variety of our offerings, I will order it to maintain our reputation for growing plants that other nurseries find too unprofitable to bother with. And then too, sometimes a long shot pays off. I ordered one tray of bearberry, *Arctostaphyllos uva-ursi* 'Point Reyes,' a woody, West Coast groundcover like a trailing boxwood; and as I expected, by Mother's Day we had sold less than a flat. But then someone with a rocky

hillside to cover came in and bought all that were left. It was as much fun as cashing in a lottery ticket.

Balancing the Schedules

While many perennials, like 'May Night,' sell well throughout the spring, others have a more restricted sales period. The spring bloomers tend to sell poorly later in the season. The demand for creeping phlox, for instance, is largely over by Mother's Day. I thus plant these in mid-February and early March, hoping to sell out by the time people stop asking for creeping phlox. Lots of pots of phlox on Memorial Day, with their flowers spent, are distressing to a nurseryman. There is a similar early demand for arabis, aubrieta, cerastium, candytuft, forget-me-nots, and to some extent, poppies. I believe there are two things that cause the seasonality of these sales. Everyone acknowledges that plants sell best when they are blooming in the pot, but sales of perennials are also made when they are seen blooming in gardens. By planting creeping phlox in April, I can arrange to have it blooming in May; and, although it looks attractive, it does not sell. But when this phlox is blooming in gardens, people come to the nursery looking for it – and can even be persuaded to buy it green.

The scheduling of summer blooming perennials is more complicated and challenging. For one thing, the sales demand does not correspond to their period of bloom. For the most part, they do not bloom in the quart pots, and their time of bloom in gardens comes after the desire to plant has mostly subsided. Instead, because they are among the best known and most popular of perennials, they are in demand throughout the spring. The difficulty for the grower is to overcome the natural tendency of these plants to begin their growth cycle late in the spring, and by so doing be able to produce saleable plants for early sales. Among the summer bloomers, the Shasta daisies and garden phlox will grow well from an early planting; coreopsis 'Moonbeam' and rudbeckia 'Goldsturm' grow slowly until it warms up; and butterfly weed and the coneflowers will do nothing much at all before people start looking to buy them. All the cultivars of *Echinacea purpurea* we have tried have shown this same tardy development. The way I schedule echinacea 'Ruby Star,' for example, is to order just a couple of trays for the mid-February planting date, and then progressively more for the three later rounds of planting. But what I find is that all four plantings become saleable at roughly the same time, as if they had all waited for the same starting bell. My plan for next year is to plant some quarts of echinacea in late August for sale the following April. Produced on such a schedule, they may still not show much top growth, but they will at least have a well-established root system.

I suppose it is part of my bedding plant mentality to prefer not over-wintering quarts but to produce them from plugs planted in the spring. Even so, I have gradually developed a fall production schedule when it provided a clear advantage. It can solve a production problem. For instance, our forget-me-nots did not always bloom from a spring planting, probably because the plugs we purchased were not properly vernalized. By planting in September and overwintering, we ensured good vernalization and got spectacular bloom. Some plants just do better from a fall planting, and the hellebores are a prime example. They did not do well when planted in the spring; but starting them out in the fall, when their natural growth cycle begins, gave us stockier, healthier plants. Ferns can be planted in the spring; but since they grow slowly and need a full 12 weeks to root in properly, I had to plant them on the earliest possible date. I found, however, that they did not establish well in the cold and overcast days of February, and it proved difficult to avoid overwatering them in those circumstances. When planted in late August, they establish well, and their strong regrowth in spring produces a clearly superior plant. And, finally, I decided to start hostas in the fall, not to get a saleable plant but one of higher quality. We grow mostly newer varieties of hosta in the quarts, and since the little tissue culture plugs mostly cost between $2 and $5, we have to charge a lot for the finished quarts. I myself would balk at paying our prices for under-developed, single-fan hostas. Starting them in the fall produces beefier plants and creates the perception of value that justifies our prices.

It was while cutting back overgrown flats of lamium that I decided to start making changes in how we scheduled quart production. Scheduling is, of course, based of the growth rate of the plants; and for perennials this varies greatly. Lavender, for instance, grows so slowly that I have never seen it looking crowded in a flat. Most perennials, however, can become over-crowded; and among the worst culprits are foxgloves, shasta and gloriosa daisies, gaillardia, knautia, agastache, and the broadleaf-types of coreopsis. There are also the problematic trailers like Creeping Jenny, *Lysimachia nummularia*, which become so entangled with each other that they can't be separated without cutting them apart. I try to avoid problems with the worst offenders by planting them so late that we never have quite enough to meet demand. In general, I move their schedule back three weeks. For example, if I think I can sell 200 quarts of digitalis 'Excelsior,' I would skip the first planting week, plant one tray of 54 on the second (March 8), one tray on the third (March 29), and then two trays on the fourth (April 19). It is a calculated scarcity. Things don't always work out as I hope, but my timing gets better each year.

Evaluating and Upgrading

When sales don't cooperate with my plans, and some of the more vigorous perennials threaten to become over-grown, I do have an easy way out: upgrading. I try not to wait until the quarts have stretched and become unsaleable before upgrading, but instead I make every effort to upgrade these quarts **before** they become overgrown. If they are potted up into gallons while they are still in prime condition and actively growing, they finish handsomely within two weeks. Ideally, when the second planting of an item becomes saleable, I upgrade whatever is left of the first planting.

The prospect of upgrading takes me beyond the subject of scheduling quarts

Continued on page 10

Scheduling Quart Production of Perennials

continued from page 9

to a consideration of the nursery's entire production. Just as the goal of quart production was to have a continual supply of fresh, high-quality quarts in April, May and June, the goal of gallon production is much the same but with a sales period extending into the fall. The upgrading of quarts contributes significantly to this goal, and in fact between 30,000 and 40,000 (or roughly half) of the gallons we produce are from the upgrading of quarts. So, when I said earlier that I tried to tailor production of quarts to demand for sales, I was not telling the whole story. First of all, there are a number of perennials (and the list gets longer each year) that I knowingly over-order so I will have the extra quarts for upgrading. With these varieties, upgrading is our primary, or sometimes our only, way of obtaining the gallons. Then too, knowing that it is impossible to predict with complete accuracy what will sell, and not wanting to be in the position of not having enough of anything, I over-order across the board, but in moderation. I can accept the overages, actually welcome them, as long as I have the labor to upgrade the quarts and the space to set them down, both of which I attempt to plan for.

At Greenfield Plant Farm, we produce gallons in three ways: by planting small plugs (72's) in the fall, by planting bare roots and large plugs in the spring, and by upgrading quarts in late spring and summer. We have five heated houses that we use for quart production, but since the last of these is not filled until late in the spring, we use two of them for the gallons planted in the fall. Let me illustrate how quart production feeds gallon production with our familiar example of salvia 'May Night.' This year, I planted roughly 300 (six trays of 54) gallons in the fall, putting half in one house and half in the other. Let's call them houses four and five. These 300 gallons are slated for sale in April; and by applying a little heat in house four, I can bring that batch on first and sell it first to make room for new quarts. The first 540 plugs of *Salvia* 'May Night' arrive on February 16 for the first round of quarts, which goes in house one. Another 540 plugs arrive on March 8, and those quarts go in house two. The fall gallons and the first round of quarts should be ready to sell at the same time, that is, through the month of April.

'May Night' is such a popular plant that I expect the 300 gallons will be gone before the end of the month. To have a continual supply, the plan is to upgrade about 150 of the quarts in house one. As soon as the quarts of round two are ready, around mid-April, we upgrade whatever is left of round one. We do this upgrading right in house one, and set the gallons down in the space that has opened up from the sale of quarts. The new gallons of 'May Night' should be ready for sale the first week of May, not quite in time to prevent a gap in the supply. This anticipated gap is filled by 200 bare roots of 'May Night' planted in early March and grown in an unheated house.

Ideally, upgrading quarts of 'May Night' would continue, with the leftovers of each batch upgraded as the next batch is ready to sell – and as space becomes available. The hope is to have a second batch of upgrades for late May, a third for June, and a fourth for the summer and fall. This effort to **plan** gallon production from upgrading quarts is new this year, and even the limited success we have had shows promise. What I need to extend it further is better records of sales by week, the assurance of manpower, and the allocation of space. With a concerted effort, considerable refinement in the system seems possible.

A Summary

My original goal in scheduling quarts was to have a continuous supply of saleable plants during the period they were in demand. When I see that the sale of quarts has increased nearly 75 percent in four years, I congratulate myself on the success of these plans. Quarts are important to us, because they generate more income per square foot of growing area than anything else does. Since we are a small nursery with no room for expansion, the only way we can generate more income is by finding ways to make the space we have count for more.

To get some idea of what the quarts mean to us financially, I can compare the potential income from five houses where we grow only gallons to the five houses where we grow the quarts. In the first case, the five houses are filled with gallons ready for spring sales. Each house holds approximately 5,000 gallons (25,000 total). As these gallons sell, the houses can be refilled with 25,000 more. Assuming that all these sell at retail price, the most income that could be generated from these five houses is 50,000 x $7.95 = $397,500. With the five houses for quart production, two houses are filled with gallons in the fall. By the time those 10,000 gallons sell in the spring, all five houses will be filled with quarts, 119,700 total. Of these, about 90,000 sell as quarts, while the remaining 30,000 are upgraded and put back into the same five houses (I am assuming that one of the houses turns early enough to be filled a second time). Thus there are 40,000 gallons all together, and the most income that could be generated from these five houses is the sum of 40,000 x $7.95 = $318,000 and 90,000 x $3.95 = $355,500, which is $673,500. With these theoretical numbers, the income from the five quart houses is 70 percent more than from the five gallon houses. Unfortunately, the actual incomes are quite a bit less, but the income generated from the quart houses should still show that 70 percent advantage.

In the above comparison, I was assuming that all gallons are created equal, but they are not. A gallon that is saleable when people are buying is worth more than one that becomes saleable when people are staying home. A significant advantage of our quart-to-gallon system is how quickly the upgrades are ready to sell. I estimate that compared to potting bare roots or large plugs, the upgrades finish two weeks sooner; and those two weeks can be critical when you are trying to get product ready before customers decide to stop coming in to shop. A fact of life for us is that sales decline during the last two weeks of June – some years

gradually, some years precipitously. If quarts are upgraded in mid-May, they can be ready to sell in early June, but a bare root or large plug planted the same time won't be ready until mid-June. It's the difference between arriving late to a party and arriving after it's over.

The other advantage of the quart-to-gallon system is that it combines reliability with flexibility. Trying to order bare roots or large plugs for replacement gallons has inherent problems. First, there is often a scarcity of the more desirable or in-demand items, so these tend to sell out early and not be available when you need them. Second, what you do get will have been held for an unnaturally long time in a cooler or a cool greenhouse, and consequently the quality may have suffered. If you wait to order off the end-of-spring clearance sheets, you can get some bargain prices, but you may not be able to find the plants you want. If you order well in advance, you are ordering without knowing exactly what you need or when you need it. If, however, you rely on upgrading quarts to replace gallons, and have thoughtfully planned your quart production with this in mind, you will have the plants you need just sitting there waiting for the space to open up for them. Like having money in the bank, it gives you a feeling of security. Because there is some of most everything in quarts, you have the flexibility to plant what you know you need. If you see that you are running out of rudbeckia 'Goldsturm,' you can pot up a hundred or so. If a landscaper comes in looking for 200 leucathemum 'Becky,' you can say that you will have them ready in two weeks. It is like having a well-stocked supply room; it makes the operation efficient and cuts down on the frustration. This may not be the cheapest or easiest way to produce gallons, but what good is a cheap gallon if you don't have it when you need it?

Michael Cunningham
Greenfield Plant Farm
3866 Spring House Lane
Cincinnati, OH 45229
513-221-6047
mandpc@fuse.net

Building Your Effective Marketing Plan

Continued from page 1

Sales is actually going out, asking for the order, and getting the cash. Marketing is creating a perception. The definition I like to use is: Marketing is the total process, including a number of various functions involved in creating a demand for goods or services (plants, flowers, etc), that results in moving the products from the producer or provider (you) to the consumer.

I have to confess that when I first came into the horticultural industry, I worked as a vice president of marketing and sales, but I really didn't understand the differences between the two. What I want you to understand right away is that in marketing, you are trying to bring people **to** your business so you can make the sale. There are a variety of things you can do to achieve that, but it's a different kind of thinking than you might be used to. For instance, you might say, "I'm advertising, that's marketing my company." But advertising is only one component of marketing. Let's think about the entire process.

Planning is the Key

Marketing is not just a plan; it's a strategy. You must look at what end result you want and think about where you want to be with your whole company and all of your products. The marketing plan needs to be written like a strategic plan – complete with objectives and an action plan to reach the objectives. Write out a plan for what you want to achieve, and then you have to stick to it. Remember though, it takes dedication to do this. There are always a lot of good ideas, but implementation is the issue. I often say "It's simple, but it's hard," meaning that it's simple to get ideas, but it can be very hard to implement them.

The Essence of Marketing

Define the market. You need to know who your customers are, or who you want them to be – whom you are trying to move.

Understand or establish your market position. How does the world perceive you – i.e. are you the high price or low price? The good service or the drive-through? When people think about plants or flowers, does your business come to mind, or are you a last resort?

Research the market and the customer. The customer and the market often change, and if we're not careful, they will change without us noticing. You may need to keep reinventing yourself in the market. Often we don't recognize the changes until it's too late. The market may move away from where we are focusing our efforts, leaving us in a dead or dying market

Evaluate and create the product or service that meets perceived demand at the price you desire. We often allow ourselves to be driven by what the competition is doing or what we think the market will bear. A number of companies are now doing research in horticulture and floriculture, and every single one of them states that price is **not** the prime factor that motivates a buyer in our industry. It's there as an issue, but not the prime factor in decision making. Quality, service, and ease of finding the store are equally or more important than price ever is. You need to understand what your market is looking for and create a plan to fit that.

Proactively develop advertising and sales promotions. Don't wait until the newsletter representative comes by and tries to sell you an ad or a radio station asks you to buy some radio time, and you quickly say "yea, why not?" You need to have your strategy thought through before you get asked. Know who you want to influence and evaluate the best way to reach them.

Continued on page 12

Building Your Effective Marketing Plan

Continued from page 11

Train staff to understand your goals, products, and customer needs. Owners and managers are key, but it's the people you have on staff who determine the difference between success or failure for you. You can't be everywhere at the same time, so you need to hire the staff who can be there for you and help your customers be successful. Be forewarned, this is a never-ending process. Remember to train them to sell, and monitor their performance.

Things You Need to Know

I've found that if you take the time to write down your answers to these questions, it'll have a longer impact.

- Who is your target market?
- Who are the ideal customers in your target market?
- Who is competing for these customers?
- What do you know about your competition?
- What are your current and/or possible distribution channels? If you are a grower, you don't just deliver plants anymore. You are delivering the plants and promotional material as well. I'm seeing around the country that companies are forming alliances between growers, often simply to be able to have enough product available to supply some of the big box stores. I know some companies that deliver their competitor's plants in order to meet the retailer's needs. Others have become a trucking company in addition to the plant business – they subcontract to haul plants for others too, so their trucks are never empty. If you're a retailer, what does this mean? How do you or can you leverage your efforts? When you work with a church or other fund-raising group, they're actually doing the selling for you. Is this a model that might be expanded?
- Will there be one key marketing strategy to build the program around? Is there **one thing** you really want to do?
- What is the best way to do sales?

The Basic Questions

Who are, or who do you think are, your customers? Who they are will drive your market. You should understand their demographics.

Are you focusing on the correct target market? Does your target market match up to how you're adjusting?

List or describe several key customers. What do you know about them: size and age of their business, age and demographic profile of potential customers, where do they come from? Develop a clear and detailed picture of your customers. The more you know about them, the better you can meet their needs.

Who is your target market for the marketing plan? Are they the same as or different from current customers? Gain all the information possible about them to better understand them. You have to establish that you have the knowledge and products this audience needs. How to turn them into key accounts will be directed by how much you know, and how well you understand their needs.

Before you complete your marketing plan, you also need to know…

- What is the geographic spread and size of your target market? For instance, the landscape is changing in many places; a vast number of homes and office parks are being built daily. If this is happening in your area, it will dramatically affect the market area surrounding you.
- What do you think are the key factors motivating possible customers to buy from you?
- How are you different from your competitors?

Who is the competition for these buyers?

What do you know about your competition? What are their strengths? What are their weaknesses? What is their market share? Again, as you write your marketing plan, you need to understand who you are really competing with and what they are really good at. You want to take them on in their areas of weakness. You want to understand your own strengths and weaknesses, so you can leverage your strengths into the market; and you want to fix your weaknesses, turning them into strengths.

Figure 1. On a regular basis, rate how the world might perceive your company.

	Low	Medium	High
Quality			
Price			
Inventory			
New Products			
Customer Service			
Image			

** Plan where you want to be.*

ofa Marketing

Position

Position means how the world perceives you. What is your image? Does your business look like someplace people would like to go? Understand your current and then the desired position in the market.

Rate your company in several areas. You can use a chart similar to the one in Figure 1. Look at how all of these categories relate to each other. For example, if you have low quality and high price, you're probably in trouble. And some people don't recognize what's happening, because they don't stop and truly evaluate how they're doing. You need to do this evaluation on a regular basis – from your customers' point of view, because their perception changes. You want to be producing the best plants, the best looking store, and may think you are, but be objective – what do others see?

Did you know it's usually easier to sell high-priced items than low-priced items, once you get the market going? People catch onto the idea that a higher-priced item is quality and there's service behind it. As a result, you get larger margins, can advertise more, and it builds from there.

What does your inventory look like? Is it filled with fresh new ideas? Are you good at new products? New displays for products? Do you keep inventory even after it is stale?

Analyze your position. What are four things you are really good at? These are the strengths you can use to build your company. Also look at your customers' view of your strengths. Do they see them as useful to their efforts?

Understand your market visibility. What makes you unique? What are you best at and what sets you apart? Do you have a dominating presence? When people think of plants and flowers, do they think of you? Are you a "household name?"

Are there new additional strategies you might want to use in the marketing plan?

- Seeking new customers or markets. Seek them out.
- Using price as a draw. Can we increase sell-through by lowering price?
- Promoting higher price and better service. Can this be a better strategy?
- Promoting a new "image." Create a program built around the image you wish to put forward.

Tools to Consider in Your Marketing Plan

As you work on your strategy, you must have tools. Evaluate the best way or ways you can address your particular market.

Examples of creative tools:

- print advertising
- product samples
- direct mail – build this list
- telemarketing/sales
- radio
- Internet – via customer e-mail
- "cold" sales visits – knock on some doors
- editorial advertising
- word of mouth – start a "rumor"
- networking – be active in your community
- partnerships – other businesses
- vendor list
- sales promotions (coupons, free services, discounts, etc)

Is it O.K. to use any and all of these tools? You only need to have a plan.

Be Creative. Avoid conventional wisdom; break out of the "we've always done it that way" mold. Consider combining media and promotions. Use direct mail for special groups. Offer a free plant with purchase. Are you long in inventory on some items? Then consider using it as a "premium" to help increase sales.

Develop a Budget

This can be a fixed amount or a percentage of sales; or you can develop a marketing plan, then create a budget and adapt it to the plan. I believe a "zero-based" marketing plan is best, meaning figure out what you want to do (within reason) and then find the money to do it. Instead of looking at the amount you want to spend (i.e. in March), decide how many customers you want in your store in March and then build a plan to get those people to show up. Yes, you'll have to be realistic and balance the budget against your ideas. You can tweak it periodically, because you still can't spend whatever you want, no matter how good the idea! Remember, a budget is part of the plan.

How much would you spend to gain a customer? You need to put a number to this, so you can measure if you're being successful or not. One promotion idea is to give retail customers "free" plants, the plants you would otherwise dump as over-production. This draws people into your place, but do it only occasionally so customers aren't always looking for something free; and don't do things the same way all the time.

Measure the results of various programs. Use response cards. Learn the demographics of your customers. Use promotional coupons. A cost-benefit analysis is a vital tool to look at:

- What are the real costs of the program (including physical items, labor, time)?
- What do you expect to gain by spending the money?
- A dollar spent will drive how much business to you?
- What return do you expect on your advertising and marketing expenses?
- How many new customers did you gain?
- What did it cost to gain each new customer?

If you don't ask these questions, you can't measure.

Now...

Develop a specific plan, complete with: what needs to be done, who will

Continued on page 14

Building Your Effective Marketing Plan

Continued from page 13

do it, when it will be done. As you develop your plan, remember to use the **Principles of Marketing**. These principles are absolute, regardless of where you are or what product you sell.

Principle of the Idea. Marketing is about perceptions, not products. Don't forget to develop the idea of who and what you are, and that you are selling products. Use your advertising to create the image of who you want to be and why people should come to you.

Principle of Leadership. Own a word and own your place in your customer's mind. Make your name your brand. Make your name the one they think of when customers think of: quality, service, and price.

Principle of Focus. Sacrifice everything but your core competency. What is it? What do you want to be known for? Focus until it hurts. Program customers to associate your name with your focus. For example, to most of us, Volvo = safety, Mercedes = engineering, and Nordstrom = service. Your name should equal the message you want to deliver.

Principle of Time. The impact over time is more important than short-term results. Don't be fooled by short-term tricks or gimmicks. Real marketing takes time and integrity. The best way for your company to market will be apparent over time. If you believe in your plan, stick to it. Adjust it if you must, but stay to a plan.

Principle of Resources. Without adequate means, even the best ideas will fail. It doesn't have to cost a lot, but it won't be free. However, great ideas aren't necessarily expensive to implement right.

Summary

A well thought-out marketing plan is your goal. Write it like a strategic plan. What is each step to be taken? Write it in detail, itemizing each component of your plan. Think about: product to promote; image or position desired – high quality; high price, new and exciting; and advertising media to use.

Spell out who will be responsible for each action. Get buy-in from the person assigned, and make clear exactly what must be done.

This marketing plan is a plan of action, so include the date it will be implemented and the date it is to be completed. Make certain all actions on all dates are coordinated; the manager is responsible for this. A suggested marketing plan worksheet is illustrated in Figure 2.

Success Takes Time. Customers are generally slow to change their buying behavior and to respond to new marketing strategies. Doing the right things usually gets the right results. Harness trends and avoid fads to build value and perceived market leadership. If you believe you are doing things right, keep up the effort until you begin to see results. Remember to keep evaluating your progress or results; and don't be afraid to make adjustments to your marketing campaign.

There are lots of great ideas out there, but it is implementation that will win. It's simple, but it's hard!

Gary Hudson
Hudson & Associates
2545 Boatman Ave
West Sacramento, CA 95691-3817
916-375-6540
Fax: 916-375-6543
gary@garyhudson.com

Figure 2. Marketing Plan Worksheet.

Goal:

Objective:

Action Plan:

	Step Description	Who	Finished By	Date Completed
Step 1				
Step 2				
Step 3				
Step 4				
Step 5				

Are You Ready for a WPS Inspection?

by Joanne Kick-Raack

Editor's Note: Joanne Kick-Raack was a speaker at the 2004 OFA Short Course. This article is a handout from her presentation on "WPS: Worker Safety and You & a FQPA Update." For more information about the OFA Short Course, visit the OFA Web site at www.ofa.org.

Introduction

In March 2000, the General Accounting Office (GAO) issued a report on the implementation of the Worker Protection Standard in the United States that was critical of EPA. In essence, the report indicated that EPA and its state partners (usually state departments of agriculture) were not doing an adequate job of enforcement and needed to improve compliance and enforcement for greater worker protection. Subsequently, as a result of oversight inspections of the six states (including Ohio) in Region 5 EPA, the regional office determined that, in general, the Region 5 states needed to improve their WPS inspections and enforcement. As a result, EPA is increasing pressure on the Ohio Department of Agriculture and other states to increase enforcement activities.

The objective for states is to ensure that each state inspector conducts comprehensive inspections, uses good interview techniques, collects sufficient evidence to document violations, and writes a report that indicates the compliance status of the inspected agricultural establishment.

What does this mean for growers in Ohio? Likely the total number of inspections will not increase, because the number of inspectors to cover all of Ohio has not increased. However, the depth and detail of those inspections will be greater. Also, WPS inspections will be more likely to occur in minor crop industries that have the majority of workers such as greenhouse, nursery, fruit, and vegetable operations. Much of field crop production does not involve workers and hand-labor tasks and is not the major target for WPS enforcement.

Common Questions

Does worker protection apply to my operation?

If you are a small operation that employs only immediate family, most of the WPS requirements do not apply. However, whenever you have workers on your operation working in areas that have had pesticides with WPS labeling applied within the last 30 days, then WPS does apply.

Who is a worker?

Growers often ask whether these requirements apply to customers or to friends that may help a grower. If you have friends that volunteer for a day to help you and they do not receive any form of payment, WPS does not apply. Most WPS provisions do not apply to customers either or to immediate family. The WPS is an occupational health standard for employees. A worker is someone who gets paid to perform tasks related to the cultivation and harvesting of plants. However, you are not allowed to let an application of pesticides contact anyone, and restricted-entry intervals apply to everyone. And, if a friend or family member were helping you, you certainly would want to provide protective gear, information, and decontamination sites when necessary.

What will an inspector look for?

Table 1 is a checklist of key items that an inspector will be reviewing at your business. The inspector may also crosscheck labels with your application records, central information, and the personal protective equipment you have provided to make sure that you are following the directions on the label and providing correct information about applications to your workers and handlers. He or she will also be conducting interviews with your employees to determine if they are receiving training, getting proper notification (oral or signs), observing restricted-entry intervals (REI's), and being supplied with personal protective equipment (PPE).

What have been the key problems that inspectors have found?

Based on Ohio 2001 data, growers have been strong in providing decontamination sites, observing REI's, and notification. However, actual compliance with REI's and notification has not been easy to determine. Providing PPE has been generally good, but could use improvement. The two areas of weakness have been training and central information. Compliance in these areas was initially higher, but has been slipping in recent years. Some grumbling by employers indicates that they feel employees do not read the central information. Regardless, a key component of this regulation is that workers have a right to be informed of the pesticides that they may come in contact with. And, accordingly, inspectors will be checking to see that up-to-date central information is in place and that safety training is occurring. Be aware that under the regulation, workers must be retrained every five years. Documentation of this training should be kept in each employee's personnel file.

Overall, approximately 20 percent of those establishments inspected had little or no compliance. Nurseries averaged 83 percent compliance, and greenhouses averaged 76 percent compliance.

Summary: Key Things To Do

1. Make training and communication to your workers a priority. Workers must receive at least "basic" safety information before they enter a treated area. The complete worker training must be done before the sixth day of their working in an area that has been treated and under an REI in the last 30 days. A grower can accept evidence of training by someone else, but many feel you are better off to train your own workers

Continued on page 16

Are You Ready for a WPS Inspection?

Continued from page 15

Table 1. WPS Inspection Checklist.

WPS Provisions	Inspection Findings	Yes	No
A. Central Information	Required information properly displayed? • Safety poster and emergency info? • Application info & posted before application? • Workers/handlers aware of location & accessible? Information displayed for required time? • Central info up for 30 days after last REI if workers/handlers present?		
B. Safety Training	Required Training Provided • Handler/worker training provided meets requirements? • Retraining every 5 years • Handlers/early-entry workers trained before doing tasks? Qualified trainer(s) used? • Certified applicator? • Trainer of certified applicators • Attended approved train-the-trainer course • Trained WPS handlers for worker training		
C. Decontamination	Required decontamination and items provided? • Provide for all handler/early-entry tasks, when workers in area within 30 days of REI (7 days if REI 4 hours or less) • Workers: clean water, soap, single-use towels, change of clothing (If eyewear is required, immediate access to 1 pt. eye flush.) Requirements for decontamination location met? • Within ¼ mi., at mix sites, at PPE removal sites, access to eye flush		
D. Entry Restrictions	Restrictions during application met? • No persons allowed in treated area if not handler • Buffer zones for nurseries/greenhouses met REI requirements met? • Workers not in REI area except when allowed by WPS Exceptions to REI's appropriate? • No contact, allowed short-term tasks, ag emergency, approved exceptions (limited contact, irrigation) • Requirements for early entry met (provide & maintain PPE, read label safety info, prevent heat illness, have decontamination)		
E. Notice of Application	Workers given required notifications? • Oral warning, posted treated areas, double notification if required • Signs not posted before 24 hours of application, removed within 3 days of application and before worker entry Required posting used? • Have in English & Spanish (or other language) "Danger Pesticides – Keep Out" with WPS symbol in center • Size: standard 14" x 16", smaller size in greenhouse <25' apart Oral warnings contain required information? • Location/description, time entry is restricted, instruct not to enter		
F. Personal Protective Equipment	Required PPE provided? Duties of PPE met? Measures to avoid heat illness taken?		
G. Information Exchange	Required exchange between employers met?		

ofa Grower

Table 1. WPS Inspection Checklist (continued).

WPS Provisions	Inspection Findings	Yes	No
H. Monitoring Duties	Visual/voice contact every 2 hours when handler uses a product with skull and crossbones? Greenhouse fumigator has continual monitoring? • Visual/voice contact with another handler with PPE		
I. Inform Handlers	Handlers have immediate label access and safety information? Handlers instructed in proper equipment use?		
J. Equipment Duties	Handlers inspect equipment before use?		
K. Inform others	PPE cleaners informed that PPE may be contaminated and risks? Contracted equipment workers/mechanics informed of pesticide risks?		
L. Crop Advisor Exemption	Meet crop advisor exemption requirements?		

rather than rely on the validity of training elsewhere. Ohio does not have an approved training card for this reason. Handlers must be trained before they do any "handling" activity. Individuals who are licensed applicators or have received "Trained Serviceman" training that meets Ohio's Pesticide Law criteria are considered trained.

2. Post application information, emergency information, and the safety poster in a central location that is **accessible** to employees. Information in your office in the computer is not considered accessible to employees. Be aware that you cannot use 911 as the emergency number. You must provide the phone number of the nearest emergency medical facility.

3. Provide proper personal protective equipment that is in good condition and clean. Provide convenient soap, water, and towels (decontamination sites).

4. Notify your workers where applications are being made or where REI's are in effect, and post appropriate signs when required. Monitor fumigation applications and ventilate greenhouses properly.

Remember…the key intent of this regulation was to protect your business's most valuable asset – your employees – from any possible long-term health effects from pesticides in the workplace. Overall, you can achieve this by informing workers of applications, taking steps to reduce exposure, and being prepared to provide emergency assistance if that is ever necessary.

Where can I get more information?

An overview of the WPS for the floriculture industry is provided in the OFA publication *Tips on Managing Floriculture Crop Problems*. Some of the recent changes/exceptions are noted. Also highlighted are specific requirements for greenhouses.

In general, much of the information in the original WPS how-to-comply manual still applies, and it is the most comprehensive source of all the requirements.

You should also have a WPS poster for display, handler training manuals, and worker training manuals. All are available through Gempler's, as well as approved training videotapes for conducting worker or handler training. All materials are available in English and Spanish.

Joanne Kick-Raack
The Ohio State University
Pesticide Education Program
1991 Kenny Road
Columbus, OH 43210
614-247-7489
Fax: 614-292-9783
Kick-raack.1@osu.edu

Making Sense, or Cents, of PGR Use

by Steve Carver & Peter Konjoian

In these days of changing, leaner economic times, growers who plan to stay in business are much more conscious of the costs that go into producing their crops. Cost has become a more significant factor influencing production decisions. Even "small" expenses are scrutinized.

When you plan your crop height management strategies, what considerations do you entertain? How much weight should you give to the direct cost of the plant growth regulators (PGRs) in your considerations? Our goal with this article is not to provide you with a recipe for optimizing plant height management while minimizing your PGR costs – no such formula exists. We just want to remind you of some principles, including cost, that you already know, that should help as you review your own strategies.

So, when you think about plant height management, what questions do you ask yourself? Hopefully, among them are:

1. What market are you growing for; i.e. what level of quality will your market tolerate? On the surface, that question sounds "sacrilegious." It seems to contradict one of our industry's bedrock tenets, which in the words of an old Ford marketing slogan, is "Quality is job one." You know the reality is that the market to which you are selling sets limits on the amount of resources that you can afford to invest to produce a quality crop. This limitation obviously impacts all aspects of production, but will very much be reflected in the plant height management options that are open to you. In truth, the precept is not "How do I grow a crop of maximum quality?," but "How do I grow the best quality crop given the limitations on resources imposed by the market I'm servicing?"
2. What crop and crop cultivars are you going to grow? Are they adaptable to your growing environment? We all know that different cultivars of the same crop species can differ significantly in the relative sensitivity to the various PGRs. Do you know how responsive they are to the various plant height management options open to you? Are there other less aggressive cultivars that can be substituted?
3. What part of the country are you in, and what is the season? The more direct question is what light and temperature levels will your crop be exposed to during production? Both will have a significant influence on crop vigor and the relative effectiveness of your PGR options.
4. Will you be growing enough of the crop to fill a "greenhouse unit," allowing you to tailor the environment and culture specifically for that crop? The use of non-chemical means of plant height management, e.g. temperature (DIF or DIP), nutrition, irrigation, light filtering, or to a lesser degree brushing/shaking are greatly facilitated if all the crops in a greenhouse unit can be treated uniformly.
5. What level of experience and comfort do you have with the various PGRs and application methods that are labeled on the crop under consideration? Are you willing to trial new cultivar/chemical/application technique combinations?
6. What is the cost of the PGRs you might use in the production of a given crop?

So let's look at a simple and rather generalized example to see what we can learn. First, we need to gather some information and make some assumptions to make our example instructive. How much do the chemicals cost? Table 1 presents costs for several PGRs presented in several different formats. The cost per unit of PGR concentrate was taken from a Griffin

Table 1. PGR costs per unit of concentration, per ounce, and per gallon of final spray solution.

Product	Cost/unit of concentrate	Cost/oz	Cost/gallon of final spray solution based on low, medium and high recommended concentrations (ppm)		
			Low	Medium	High
A-Rest	$76/qt	$2.38	5 ppm; $5.77	10 ppm; $11.54	20 ppm; $23.04
B-Nine	$102/lb	$6.38	1,250 ppm; $1.24	2,500 ppm; $2.49	5,000 ppm; $4.98
Bonzi	$144/qt	$4.50	10 ppm; $1.44	20 ppm; $2.88	30 ppm; $4.32
Cycocel	$92/qt	$2.88	750 ppm; $2.36	1,500 ppm; 4.69	3,000 ppm; $9.36
Florel	$20/qt	$0.63	300 ppm; $0.61	500 ppm; $1.02	750 ppm; $1.53
Sumagic	$115/qt	$3.59	2 ppm; $1.87	5 ppm; $4.60	10 ppm; $9.19
Cycocel/B-Nine Tank Mix		$2.88/	800/800 ppm; $3.31	1,500/1,250 ppm; $5.93	2,000/2,500 ppm; $8.77

ofa Grower

Table 2. Assumptions and resulting PGR costs per poinsettia crop.

Products	Central Ohio			Central Florida		
	# of Apps[a]	App Conc[b]	Cost/Crop/ft^2 [c]	# of Apps[a]	App Conc[b]	Cost/Crop/ft^2 [c]
Bonzi	3	medium	$0.04	3	very high	$0.10
Cycocel	3	medium	$0.07		—	
Florel	3	medium	$0.07	3	very high	$0.21
Cycocel / B-Nine Mix	3	low	$0.05		—	

[a] If these assumptions aren't realistic for you, substitute numbers that are more representative of your operation/area and interpolate the results.

[b] Application concentration (low, medium, high) corresponds to the "Cost/gallon of final spray" columns of Table 1. To simplify calculations and presentation, we assumed that application concentration would remain constant through production.

[c] This is only a crude approximation based on the following function: Number of applications during production (# of Apps) X dollar amount listed in the "Cost/gallon of final spray" columns of Table 1 / 200. It is assumed for this calculation that 1 gallon will cover 200 square feet. Very high concentration = 45 ppm (Bonzi) = $6.20/gal spray; 15 ppm (Sumagic) = $13.79/gal spray.

Greenhouse & Nursery Supplies' price list in June of this year. Based on the cost per unit of PGR concentrate, Florel is a real bargain while Bonzi costs more than seven times as much for the same volume of concentrate.

But of course we know that is only part of the story, because formulations of the PGRs come in different concentrations and the PGRs are effective in different ranges of concentrations. Therefore, costs per gallon of final spray solution for each PGR have also been calculated in the low, medium, and high portions of their recommended ranges. Looking at these costs, the picture changes a bit. Florel is still the bargain (again, we are only looking at costs at this point), but Bonzi has become much more reasonable, comparable to B-Nine.

But you know that we are still not done. PGRs vary in their relative effectiveness. So, for a given crop species/cultivar, a low rate of B-Nine may not retard growth to the same degree or for quite as long a period as a low rate of Bonzi (assuming of course, that both materials are labeled for use on the crop). Often, that variance will change when looking at a different cultivar of the very same species. The second cultivar might exhibit similar sensitivity to B-Nine (or not), but might be far less sensitive to the actions of Bonzi – therefore requiring a higher concentration be applied to obtain the same level of plant height management as that observed on the first cultivar with Bonzi. The variance in effectiveness between cultivars and between PGRs is typically more pronounced under hotter growing conditions.

Let's discuss two hypothetical greenhouse poinsettia growers, who for some odd reason, grow only one poinsettia cultivar – although different ones at the two locations. For the sake of simplicity, these growers are also a bit timid and will only consider using spray applications. The first grower is producing a medium-vigor cultivar under typical warm summer/early fall conditions of central Ohio. The other is growing a very vigorous cultivar under the hot central Florida sun. Based on these givens, we'll present a table of assumptions and resulting PGR costs per poinsettia crop (Table 2). Note, to make these assumptions realistic for you, merely substitute numbers more characteristic for you and your operation and interpolate the results.

Is this the end of the story? NO! Most poinsettia growers don't grow under the simple assumptions made in this example. Many growers use graphical tracking and temperature as a primary means of plant height management, with PGRs used on an as-needed basis. Many others use a combination of application techniques (which depending on the crop may include drenches, sprenches, dips, soaks, and media sprays) and sometimes PGRs themselves. The cost of a drench application will vary from a spray application for a number of reasons including: the duration of its intended effectiveness, the time involved making the applications, and implications for labor costs, etc.

So now that we have at least a partial answer to the question of PGR costs, how much weight should you give it when developing your plant height management strategies? The answer will not be the same for every grower. However, I believe it should be only one of many factors that are balanced together, becoming a/the significant factor perhaps only in those situations where return on the crop is exceedingly thin. What do you think?

Steve Carver
OFA

Peter Konjoian
Konjoian's Floriculture Education Services
48 Brundrett Ave
Andover, MA 01810
978-683-0692
Fax: 978-683-6962
peterkfes@aol.com

The University of Minnesota Floriculture Program: Changing to Meet the Needs of a Rapidly Changing Industry

by John Erwin

Introduction

The floriculture program at the University of Minnesota has evolved and grown during the last decade. Harold Wilkins and Richard Widmer (previous floriculture faculty), the Minnesota Commercial Flower Growers Association, and the Richard E. Widmer Teaching and Research Fund provided a strong foundation from which to grow. We are now the largest floriculture program between Lake Michigan and the Pacific Ocean in the northern United States. The University of Minnesota itself has grown and is now the second largest public institution in the United States, with 52,000 students – and it boasts of being the birthplace of the green revolution through crop development by Nobel Prize winner Neil Borlaug, the pacemaker inventor, the inventor of the heart/lung machine which allows open heart surgery, behaviorism through B.F. Skinner's pioneering work, hundreds of cold-hardy plant introductions, the inventor of the flight recorder box, inventor of the retractable seat belt, just-released Honeycrisp apples, and Garrison Keillor, among many other contributions.

Today, the University of Minnesota floriculture program includes two faculty (Neil Anderson and John Erwin), a new Bachman Endowed Chair for Horticulture Crop Marketing (currently being advertised), a post-doctoral student, and seven graduate students studying areas as diverse as Gaura breeding – to inducing natural plant defense mechanisms – to identifying flowering requirements for bedding plants – to new crop development. In addition to faculty directly involved in the floriculture program, there are a number of collaborative faculty including Jerry Cohen (plant growth regulators), Cindy Tong (postharvest physiology), and Bud Markhart (plant water relations) who participate in the floriculture program. In addition to staff, we have new greenhouse facilities and growth chambers that allow us to conduct environmental physiology research in a highly controlled environment.

This article will briefly describe some of the exciting areas that the University of Minnesota floriculture physiology program has been working on and future projects that will be initiated this year. Much of this work is conducted, of course, through the efforts of our wonderful graduate students as well as my postdoc Esther Gessick. Our most recent past graduate student, Ryan Warner, is the new floriculture faculty member at Michigan State University (Royal Heins' previous position) as of this fall.

Environmental Effects on Flowering

Flowering Physiology. Recent research has focused on how a grower can use light intensity and daylength to control flowering of many bedding plants. This information is now being used in some of the plug and bedding plant industry to prefinish seedlings to flower early or later, or to follow another schedule. Much of this work will be published in a variety of national trade magazines in the near future. As part of that work, we coined two new terms to describe how light affects flowering of plants in general: facultative irradiance response (increasing light intensity hastens flowering developmentally) and irradiance indifferent response (increasing irradiance does not hasten flowering). Much of the past work was conducted by Neil Mattson (Ph.D. student at the University of California – Davis) and Ryan Warner (faculty at Michigan State University). We are continuing this work on additional bedding plant species this season. In addition, we are initiating a program where we will identify daylength and light intensity requirements for crops sent to us by companies, i.e. a contract business. We believe there is a growing need for this, because many companies may not have the facilities or staff to quickly identify daylength and light intensity requirements of all these new species that are coming onto the market.

High-temperature tolerance in plants. We know high temperatures can reduce or eliminate flowering on many bedding plants, but not the reason why. Through a variety of experiments conducted by Ryan Warner, we have been trying to understand how high temperature reduces flowering. In addition, we studied the impact of short-term high temperature exposures on growth and bedding plant photosynthesis. We have found some very interesting results. For instance, a single short-term (two-hour) high temperature exposure (95°F) can reduce the maximum amount of photosynthesis that a pansy and New Guinea impatien can do by approximately half, and interestingly, that reduction can persist for three days after the initial two-hour exposure. Additional research showed some involvement of the plant growth regulator ABA (abscissic acid) in heat tolerance in selected model crops.

How Much Light Can a Plant Use?

It is amazing how little we know about how increasing light intensity, temperature, and/or carbon dioxide levels affect photosynthesis of common bedding plants. Because this information is integral to understanding how to manage lighting, temperature, and carbon dioxide levels in a greenhouse, we are initiating studies to obtain this information. Essentially, we will identify those conditions that optimize photosynthesis for each of the top 10 bedding plant species and make

ofa Academic Update

recommendations to growers based on this data combined with the photoperiod work already mentioned.

Plant Defense Mechanisms

Natural plant defense mechanisms. Believe it or not, plants are able to communicate with each other via natural volatiles that are released from a plant and travel through the air and are perceived by other plants. These signals can inform adjacent plants that surrounding plants are being attacked and allow time to alter growth to start defending themselves before they are attacked or infested. Charlie Rohwer, a Ph.D. student working with me, is currently conducting research on how we could use a plant's own defense mechanisms to increase plant defenses to reduce disease and insect infestation and ultimately the costs associated with pest and disease control in a greenhouse environment. He is also looking at how the environment, the kind of pest, and the nature of the stress impact the release of two of these volatile compounds and how plants respond to them. Lastly, we are also looking at how to use this information to better prepare plants for shipping to reduce losses due to diseases.

Growth Regulator Research

Delaying flowering on pansies. Pansies germinated and grown in the summer for shipping and finishing in the fall in southern regions of the United States often flower too early, do not branch enough, and as a result, often do not fill the finished container. We had the idea that spraying pansies with Florel to delay flowering and promote branching may alleviate this problem. The idea worked. This idea is consistent with Peter Konjoian's research on spraying vegetative stock plants or cutting propagated bedding plants such as geraniums to abort flowers and induce branching, and it is my understanding that he came up with the same idea years ago! This work was recently followed up on by Royal Heins and Erik Runkle at Michigan State University. We just finished a joint project with David Van Wingerton (Green Circle Growers), Sakata Seed, Goldsmith Seeds, and Kieft Seed to examine the differences between the responses of different pansy cultivars to Florel applications. This information will be published in a future article. Lastly, other recent research Charlie Rohwer conducted showed that differences in Florel response between facilities and times of the year was primarily due to differences in drying times or humidity. We have and are developing application techniques where growers wash off plants after a Florel application and after a period of time to allow them to get the same response regardless of environmental conditions.

How do growth retardants affect growth in Northern climates? Because so many new plants are being introduced each year, our understanding of how common growth retardants such as B-Nine, Cycocel, Bonzi, and Sumagic affect stem elongation has fallen behind. In addition, much of the existing work on growth retardants is conducted in the South. We are focusing on how growth retardants affect stem elongation on many new crops in the northern United States. Lastly, we are looking at providing recommendations for tank mixes that can reduce total growth retardant use and therefore reduce costs. Some of these tank mixes include Florel. Also, we will be conducting experiments this year to determine if rewetting foliage after an initial application or increasing humidity just prior to application can increase growth retardant efficacy.

Can ABA increase postproduction life?

Preliminary experiments at the University of Minnesota and North Carolina State University showed that a new compound based on ABA (Valent Chemical) can increase post-production life of some cut flower species. We are continuing this work on a variety of other cut flowers and cultivars. Additionally, we are looking to see if there is any application of this compound (prior to shipping) to extend postproduction life of potted plants and bedding plants after shipping.

New Crops Program

Polyploidy. Induction of polyploidy (increasing ploidy level per cell – the number of DNA copies in the cell) is a way to change plant form and/or flower size. With the increase in vegetative propagation, it seems as though polyploids that are produced from common bedding plants such as petunias, impatiens, or ageratum may have potential as new crops. Therefore, Esther Gessick and David Zlesak are conducting experiments on identifying which compounds are most effective in polyploidy production and what environmental conditions produce the highest percentage of polyploids. So far, we are finding that different chemicals vary greatly in their ability to cause mutations, and the environmental conditions when mutagens are applied have a great effect on efficacy. It is our hope that we will produce new polyploids of common bedding plants in the coming years. In addition, we hope this information is also significant for seed companies.

New Crops. We are currently evaluating several genera from North and Central America for new potential bedding plant crops. Specifically, we are evaluating *Salvia* spp. and *Lewesia* spp. for new bedding/potted plants. In addition to North and Central American spp., we are conducting a number of studies with South African spp. – both at the University of Minnesota and in South Africa. Why South African spp.? Southern Africa is home to an estimated 30,000 species of plants, of which approximately 2,700 species are bulbous geophytes. Many of the species there have significant commercial potential as new floriculture crops. We currently have collaborative research programs with the University of Natal and the University of Stellenbosch, where we jointly support three graduate research assistants. Each of these projects is identified on the following page:

Continued on page 22

The University of Minnesota Floriculture Program: Changing to Meet the Needs of a Rapidly Changing Industry

continued from page 21

Propagation of Geophytes. Tissue culture offers the advantage of rapidly producing large numbers of plants from a small quantity of source material, thereby allowing rapid distribution. The genus *Gladiolus* is of horticultural importance and is widely used in floral industries. There are hundreds of Gladiolus spp. in South Africa. Members of the genus *Watsonia* also are a spp. with significant potential as a new crop. The genus *Watsonia* comprises 52 species indigenous to southern Africa, 34 of which are endemic to the winter and 21 to the summer rainfall regions. Compared to other members of the Iridaceae, less attention has been paid to improving existing species and developing new *Watsonia* hybrids. There are no indications *Watsonia* spp. have been successfully propagated *in vitro*. Our recent efforts have resulted in in vitro germination protocols. Surprisingly, both an auxin and a cytokinin are required for shoot multiplication, and this occurs simultaneously with root formation. Shoots were subcultured for multiplication and then propagated in a liquid-shake culture. Shoots regenerated from the liquid culture were used for corm induction experiments as well as rooting. We continue this very promising work on propagation of geophytes and believe it will result in the introduction of a number of new bulb crops in the future.

Flower Induction and Initiation of Dierama and Gladiolus spp. Two South African genera with great potential as potted plants or cut flowers are *Gladiolus* and *Dierama*. We initiated a project with J. Van Staden and a graduate research assistant at the University of Natal to better understand how to induce these plants to flower.

Micropropagation of Proteacae and Molecular studies. South African proteas are sold as cut flowers world-wide. We are developing protocols for tissue culture propagation of proteas. In addition, we are attempting molecular modification to increase branching of proteas at the University of Stellenbosch.

Current Contributors to the University of Minnesota Floriculture Physiology Program

Minnesota Commercial Flower Growers
Minnesota Nursery and Landscape Association
Richard E. Widmer Teaching and Research Fund
OFA – an Association of Floriculture Professionals
FIRST
The Fred C. Gloeckner Foundation
Bedding Plant Foundation
Goldsmith Seeds
Sakata Seeds
Kieft Seeds
Valent Corporation
Syngenta Corporation
Len Busch Roses Inc.
Wagner's Greenhouses
Green Circle Growers

John Erwin
University of Minnesota
Department of Horticultural Science
1970 Folwell Ave
St. Paul, MN 55108
612-264-9703
Fax: 612-624-4941
erwin001@umn.edu

Alex Laurie Award – An Overview of the 2004 Paper

The 2004 OFA Alex Laurie Award was presented to Jeremy Bishko, Paul Fisher, and Bill Argo for work they published in the February 2003 issue of *HortScience* (38:26-31) titled, "The pH-Response of a Peat-based Medium to Application of Acid-Reaction Chemicals."

What do you do when the pH of your growing medium begins to creep up toward 6.5? If you are testing regularly and catch it in time, you may be able to blunt the rise by checking the alkalinity of your water (if you haven't already done it) and acidifying the water if need be. You can also switch to a more acidifying fertilizer, one that contains a higher percentage of ammonium.

However, what corrective action is best if pH is at 6.5 or higher when you test, your crop (petunias for example) is showing iron deficiency at such a high pH, and you need a rapid response? Some of the more common remedies include aluminum sulfate, iron sulfate, and flowable sulfur. But how much do you use? Most of the corrective recommendations are based on research that was conducted with mineral soils. Little or no work has been done comparing dosage responses of the various acidifying materials in soilless media. As a result, recommended rates are typically based on experience and educated guesstimates. The effort reported in this paper is the first step in providing empirical evidence on soilless media to provide direct support for those recommendations.

The authors' objectives were to "quantify the dose response from application of several acidic materials that have been recommended for

ofa Grower

lowering medium pH in soilless media." A quick summary of their procedures includes:

- A media composed of 70 percent peat/30 percent perlite, with the pH adjusted to an initial pH of 6.4, 6.5, 7.3, and 7.6 with dolomitic hydrated lime.
- Treatments included iron (ferrous) sulfate, aluminum sulfate, flowable sulfur, sulfuric acid, an organic acid, and an ammonium/urea-based fertilizer (21.1N • 3.1P • 5.8K) at high, mid, and low rates.
- Distilled water was used throughout the study.
- Because plants can have a profound effect on media pH and potentially mask the chemical/rates/medium interaction, plants were not included in this initial work.

The results included the following:

1. Iron sulfate and aluminum sulfate "behaved" similarly in this study. Both produced a significant drop in the pH that ranged up to 3 units within a day, depending on rate and initial medium pH. Both unacceptably increased medium EC by up to 2 to 3 dS•m-1 at the highest rates; at recommended rates of 2 pounds/100 gallons (2.4 g/L) however, the EC increased only about 1 dS•m-1. This should be acceptable except in those situations where the EC is already marginally high, in which case the medium may need to be leached before a treatment is made. The authors noted that both materials darken the media surface, and they do not recommend use of aluminum sulfate except in hydrangeas because of the high aluminum concentration added. Finally, they noted that ferrous sulfate will oxidize over time to ferric sulfate, reducing its pH-changing potential. Therefore they recommend using ferrous sulfate if it is a greenish-blue color as a solid and when put into solution, is a clear yellow color.

2. Flowable sulfur also effectively reduced pH, but did not have the initial "kick" that the sulfates had. The pH dropped more gradually up to about 3.3 units after 28 days, depending on the initial pH of the medium. The authors found that a wide range of concentrations had a similar effect on media pH, and that it was difficult to identify an optimum concentration to apply. Because sulfur lowers pH through microbial activity, which is in turn affected by factors such as temperature, moisture, and microbial population, the dose response from this chemical might be difficult to predict. The EC increased only about 1 dS•m-1 over the 28 days of the study.

3. Sulfuric acid drenches at the high rate were very effective in reducing media pH, but are problematic to use because of plant and applicator safety concerns. Follow-up research showed that repeat acid applications at water pH below 2 are likely to be needed. The pH can bounce back up within a few days after an acid drench as additional lime in the media neutralizes the acid.

4. The ammonium/urea-based fertilizer was ineffective in reducing pH in this particular study. Ammonium increases media pH through ion exchange with roots and nitrification by microbes in the growing media. Because there were no plants in this study, and presumably low microbial activity, ammonium did not drop media pH.

This work was an excellent first step in gaining a better understanding of the interaction of several acidifying agents on a particular soilless mix under a specific set of experimental conditions. But because "… multiple factors influence medium pH, including residual lime concentration and activity, plant uptake of nutrients, plant species, water alkalinity, and root medium components," much more work is needed. "Further research is also required to quantify how plant species respond to the chemicals, particularly with respect to phytotoxicity."

Want to know more about this work and follow-up research? Contact Paul at paul.fisher@unh.edu for a reprint of the manuscript.

One final note about this work: It was partially funded by FIRST, the Floriculture Industry Research and Scholarship Trust. FIRST uses donations to support research such as that reported here, and to provide undergraduate and graduate student scholarships to those who will be tomorrow's movers and shakers in our industry. You can find more information about FIRST activities and how you can be a part of them at the Web site: www.firstinfloriculture.org.

Bill Argo
Blackmore Co Inc
10800 Blackmore Ave
Belleville, MI 48111
734-483-8661
Fax: 734-483-2387
bargo@blackmoreco.com

Jeremy Bishko
3685 Randolph Road
Cleveland Heights, OH 44121
jbishko@sbcglobal.net

Paul Fisher
University of New Hampshire
Dept of Plant Biology
928 Spaulding Hall
Durham, NH 03824
603-862-4525
Fax: 603-862-4757
paul.fisher@unh.edu

Techniques to Remove Plant Pathogens from Recycled Irrigation Water

by Walter Wohanka

Recycled irrigation water from so-called "closed" irrigation systems poses a certain risk of spreading root-infecting plant pathogens. Suitable equipment, good sanitation, use of resistant cultivars, antagonism, or disease suppression may reduce the risk. However, there will remain a certain risk that requires some kind of water treatment. The decision as to whether and how a grower disinfects nutrient solutions depends mainly on the risks the grower is willing to take. Depending on the specific needs, the adequate methods can be selected out of a series of efficient techniques: heat treatment, UV irradiation, filtration, or chemical treatment.

Heat Treatment (Pasteurization)

The efficacy of heat to destroy microorganisms depends on both temperature and exposure time. For disinfecting recycled water, a high temperature (95 to 97°C) for a short time (30 seconds) is the most suitable combination. Such a heat treatment has proved to be a reliable, highly efficient means of combating all plant pathogens including viruses and nematodes. However, it has very high investment and operating costs.

The principal components of a heating unit are a pipe system, two heat exchangers, and an external source of energy (heater). In the first step, drainage water from the crop is filtered and heated to 80 to 90°C in the first heat exchanger, thus exploiting the energy already present in the treated nutrient solutions. In a second heat exchanger, which is directly connected to the heater, the temperature is increased to 95 to 97°C. This temperature should be maintained for at least 30 seconds. By pre-heating the drainage water coming from the crop, the treated nutrient solution is cooled down to 25 to 30°C. To avoid precipitation of carbonates in the heat exchangers, the nutrient solution is often acidified automatically (pH<5) before heat treatment. Recent research has indicated that exposure to lower temperatures for a longer time (three minutes at 85°C) provided the same efficiency as 30 seconds at 95°C, thus reducing the costs considerably.

UV Irradiation

Radiation of wavelength between 200 and 400 nm is defined as ultraviolet (UV) and may be divided further into UVa (315-400 nm), UVb (280-315 nm) and UVc (200-280 nm). Microbicidal activity is restricted to 200-315 nm, with an optimum at about 260 nm. The effective irradiation or UV dose is measured in Joules per square meter (J/m^2) and is the product of UV intensity and exposure time. There is considerable variation in the sensitivity of plant pathogens and their various survival or propagation structures to UV irradiation. Generally, bacteria have proved to be the most UV-sensitive plant pathogens, with lethal doses below 300 J/m^2. In contrast, significant differences in the sensitivity of plant pathogenic fungi to UV have been observed, both between species and between the different structures. To eliminate all relevant plant pathogens including viruses and nematodes, 1,000 to 2,500 J/m^2 are recommended. UV irradiation units have to be carefully designed considering target organisms and water quality. Compared to other techniques, UV shows intermediate investment and operating costs.

Mercury vapor lamps have proved to be efficient sources of UV irradiation. Low-pressure lamps, commonly used for disinfecting water, emit 40 percent of the electrical energy input in the form of UVc (200-280 nm). A common UV unit consists of a set of stainless steel tubes, each with a UV lamp in a quartz glass tube. The water layer should be as thin as possible (preferably < 10 mm). The quality of the nutrient solutions may considerably reduce UV transmission, and propagules in particles of peat or plant debris are completely protected. Hence, the design of the UV unit has to consider the transmission value (T_{10}- value) of the water, and pre-filtration is essential. Due to decreasing UV output, the radiators have to be exchanged after a working life of about 7,000 hours. UV intensity is also affected by precipitation of minerals on the surface of the quartz glass tube. Therefore, the UV intensity should be controlled by a UV sensor. If necessary, the glass tube should be cleaned or the radiators renewed. Under certain conditions, the interaction of UV radiation with iron chelates can reduce the available iron and even cause deficiency, which has to be taken into account during fertilizer application.

Slow or Bio Filtration

Of the various filtration techniques (e.g. membrane filtration), only slow or bio filtration seems to be useful for disinfecting nutrient solutions. In contrast to membrane filtration, bio filtration is a simple and robust, low-cost technique with selective efficiency. However, large areas are needed for high capacities, and frequent clogging may occur depending on the water quality.

The principle of slow or bio filtration is very simple. Raw water percolates very slowly through a bed of fine filter sand or rock wool granulate. The flow rate should be in the range of 10 to 30 cm per hour – that means a filter capacity of 100 to 300 L per m^2 filter surface and hour. Soon after the filter process begins, a filter skin forms on the surface of the filter bed. It consists of organic and inorganic material and a wide variety of active microorganisms. Depending on the raw water quality, cleaning of the filter bed will be necessary after a few weeks or months to prevent clogging. This is done by scraping off only the top layer (just a few centimeters thick). Therefore, the initial thickness of the filter bed should be 80-120 cm.

ofa Grower

A series of trials revealed a complete elimination of so-called pythiaceous fungi like Phytophthora or Pythium. The efficiency rates against bacteria and fungi with small spores (e.g. Fusarium) have been also very high, but some propagules of such organisms may pass the filter bed. In practice, the efficacy seems to be sufficient against these pathogens. Viruses and nematodes are not satisfactorily eliminated by slow filtration. However, the development of virus diseases can be inhibited considerably.

Chemical Treatment

Mainly oxidizing agents (ozone, chlorine, chlorine dioxide) may be employed as effective disinfecting agents to eradicate plant pathogens in recycled nutrient solutions. However, at least in Europe, chemical treatment of recycled irrigation water is not very common. The biocidal activity of a disinfectant is strongly related to concentration, exposure time, and water quality. One important advantage of chemical treatments (except ozone) is that their residual downstream effect possibly reduces plant-to-plant spread of diseases. Except for ozone, chemical treatments are low-cost, simple operating systems with a wide spectrum of biocidal activity. The main disadvantage is the risk of plant damage.

Ozone (O_3) is a strong oxidator and a highly unstable, toxic gas. It is commonly prepared on-site by passing dry air through an electric discharge followed by immediate injection into a reaction tank. All relevant plant pathogens are effectively killed by the oxidation process, provided that the concentration is high enough for a certain exposure time. Any ozone that has not been completely decomposed during treatment must be removed to ensure that residual ozone does not enter the root zone or the atmosphere (health hazard). Organic load and iron chelates greatly reduce the available ozone. Due to its high costs, difficult control of the concentration, and some other disadvantages, ozone's horticultural utilization is reduced.

Chlorination is the most common form of disinfecting drinking or pool water. Gaseous chlorine (Cl_2) reacts with water to form hypochlorous acid (HClO) and the hypochlorite ion (ClO^-). The HClO form, synonymous with "free available chlorine" has the highest germicidal effect and is predominant between pH 5 and pH 6.5. To disinfect nutrient solutions, chlorine is mainly supplied as sodium or calcium hypochlorite (NaOCl, $Ca(OCl)_2$) to achieve an HClO concentration of at least 2 to 10 ppm. At such concentrations, chlorination has been found to be effective against various plant pathogens. However, there is a considerable risk of plant damage, particularly when the crop is grown in hydroponics or inert growing media. Chlorine and chlorine compounds can react with inorganic and organic compounds in the nutrient solutions. Hence, the available (active) chlorine may be reduced (chlorine demand); and toxic residues, suspected as carcinogenic, may be formed.

Due to increasing problems with Fusarium in begonias and cyclamen grown on ebb/flow benches, attempts are being made to utilize **chlorine dioxide** (ClO_2) as a low-cost technique to treat large amounts of recycled water. Chlorine dioxide is a water-soluble gas which is itself biocidal and does not react to hypochlorous acid. By using sodium chlorite and hydrochloric acid, chlorine dioxide is automatically generated on-site and simultaneously injected into the water stream. Chlorine dioxide is a strong oxidant, killing a wide range of plant pathogens at concentrations of 0.5 to 3 ppm. Similar to chlorination, its activity is reduced by organic impurities, and reactions with nitrite, iron, and manganese may occur. Recently, practical experience and various trials with begonias have shown a good efficiency against Fusarium without plant damage. However, further research is necessary.

Conclusion

Currently, heat, UV, bio filtration, or various chemical treatments can be used for disinfecting recycled irrigation water. They all have their specific advantages and disadvantages. There is no "best" technique for all nurseries. Depending on the crop, target pathogen, irrigation system, size of production area, water quality, and last but not least, economic aspects, a grower may choose the one or the other. In some cases, combinations (e.g. bio filtration and UV) may be useful.

Walter Wohanka
Forschungsanstalt Geisenheim
Fachgebiet Phytomedizin
Von-Lade-Str. 1
D-65366 Geisenheim, Germany
49-6722-502412
Fax: 49-6722-502410
wohanka@fa-gm.de

Editor's Note: Walter Wohanka was a speaker at the 2004 OFA Short Course. He and Allen Hammer (Purdue University) discussed this topic during a session on "Recycled Irrigation Water: Managing Pathogens & Water Quality." For more information about the OFA Short Course or to order a CD-ROM of the educational sessions, please visit the OFA Web site at www.ofa.org.

They're Called "Soft," But They Carry a "Big Stick"

by Raymond Cloyd

and Michelle Bell

Pesticides, such as insecticides and miticides, are the primary "tools" used by greenhouse producers to minimize problems with pestiferous insects and mites. There are a number of insecticides/miticides referred to as "conventional," which include the organophosphates, acephate (Orthene) and chlorpyrifos (DuraGuard); the carbamate, methiocarb (Mesurol); and pyrethroids such as bifenthrin (Talstar), cyfluthrin (Decathlon), fluvalinate (Mavrik), fenpropathrin (Tame), and permethrin (Astro). These insecticides/miticides are effective in controlling a broad range of insects and mites, and they tend to have long residual activity. However, these insecticides/miticides are more harmful to humans and natural enemies (benefical insects and mites), and they have restricted-entry intervals (REIs) that are typically 12 hours or greater. Within the last 10 years, there has been an increase in the registration of insecticides/miticides that are classified as "reduced risk," "biorational," or "soft," because they are less toxic to humans and are short-lived in the environment. In addition, these insecticides and miticides may be less harmful to natural enemies than "conventional" insecticides/miticides. Insecticides and miticides that are classified as "reduced risk," "biorational," or "soft" include insect growth regulators, soaps and oils, feeding inhibitors, and microbials.

Insect Growth Regulators

Insect growth regulators (IGRs) are primarily used to kill the immature or young stages of plant-feeding insects including mealybugs, scales, whiteflies, and caterpillars. Insect growth regulators may be placed into three general categories: juvenile hormone mimics or analogs; ecdysone antagonists; and chitin synthesis inhibitors. **Juvenile hormone mimics** or analogs arrest development and cause insects to remain in a young or immature stage, thus preventing insects from completing their life cycle. Examples of insect growth regulators with this mode of action include kinoprene (Enstar II), pyriproxyfen (Distance), and fenoxycarb (Preclude). **Ecdysone antagonists** disrupt the molting process of insects by inhibiting metabolism of the molting hormone – ecdysone. Insect growth regulators with this mode of action include cyromazine (Citation), azadirachtin (Azatin/Ornazin), and tebufenozide (Confirm). **Chitin synthesis inhibitors** interfere with enzymes – during the molting process – that stimulate the synthesis and formation of chitin, which is an essential component of an insect's exoskeleton. As a result, insects fail to reach adulthood because they die in the young stage, or they mature into sterile adult females. Insect growth regulators having this mode of activity include diflubenzuron (Adept), buprofezin (Talus), novaluron (Pedestal), and etoxazole (TetraSan).

Although insect growth regulators generally are only effective on the young stages of insects, studies have shown that insect growth regulators may indirectly affect the adult stages by reducing the reproductive capacity or egg viability. Egg viability may be defined as those eggs that hatch into live larvae or young. In fact, several insect growth regulators currently labeled for use in greenhouses state an indirect effect on adult insects. Below are examples of these insect growth regulators with (although not verbatim) the label statements:

1. Buprofezin (Talus®; SePro Corporation, Carmel, IN)
   Talus suppresses oviposition of adults and reduces viability of eggs.
2. Etoxazole (TetraSan®; Valent USA Corporation, Walnut Creek, CA)
   TetraSan is transovarial, meaning that treated adult mites will not produce viable eggs.
3. Pyriproxyfen (Distance®; Valent USA Corporation, Walnut Creek, CA)
   Distance does not control adults, but greatly reduces the production of viable eggs in females due to its strong transovarial activity. In whitefly, transovarial activity begins within one day after adults contact or ingest residues.

Soaps and Oils

Soaps and oils work by damaging the waxy layer of the exoskeleton of soft-bodied insects and mites, thus altering the chitin so that it cannot hold fluids – resulting in desiccation (drying up) or smothering of insects by covering the breathing pores (spiracles). Examples of insecticides having this mode of activity include neem oil (Triact), paraffinic oil (UltraFine Oil), and potassium salts of fatty acids (Insecticidal Soap).

Soaps and oils are contact insecticides/miticides with short-

ofa Grower

residual properties. To avoid causing plant injury (phytotoxicity), they should not be applied frequently in succession. Caution should be exercised when using horticultural oils, because the following conditions may result in plant injury: 1) high humidity (>70 percent), 2) overcast, cloudy days following application, 3) inadequate air flow within the greenhouse, 4) high temperature and/or light intensity, and 5) frequent applications within short time intervals.

Feeding Inhibitors

Feeding inhibitors work by disrupting the behavior of insects that feed within the vascular tissues (i.e. phloem), by interfering with or blocking neural regulation of fluid intake into the mouthparts. As a result, insects starve to death within a short period of time (i.e. three to seven days depending on the target insect) because they are unable to obtain nutrients. In addition, this reduces viral transmission. Insecticides that have this mode of action include pymetrozine (Endeavor) and flonicamid (Aria).

Microbials

Microbial insecticides include insect-killing bacteria, fungi, and nematodes. Bacterial-based insecticides include *Bacillus thuringiensis* var. *israelensis* (Gnatrol) and *Bacillus thuringiensis* var. *kurstaki* (Dipel and Deliver). These insecticides work by binding to specific receptor sites on the mid-gut, resulting in degradation of the gut lining and eventual starvation of the insect. Crystals release protein toxins that bind to membrane receptor sites in the mid-gut, creating pores that allow the gut contents to flow into the hemolymph (insect blood). These insecticides are most effective on young insect stages. Bacterial-based insecticides have very short residual activity and require multiple applications throughout the crop cycle. In addition, insects have to consume the bacteria in order for it to be active and kill the target insect.

In contrast, insect-killing fungi can directly penetrate the outer covering (cuticle) of an insect – they do not need to be ingested to be active. The fungus uses the insect as a food source and consumes the internal contents before emerging and sporulating, which leads to further spread of the fungal spores. Fungi generally require high relative humidity (>80 percent) to be effective, and continuous exposure to ultraviolet light can reduce spore viability. The only commercially available insect-killing fungus in the United States is *Beauveria bassiana* (BotaniGard and Naturalis-O). Fungi-based insecticides have very short residual activity and generally need to be applied several times during a cropping cycle.

Beneficial nematodes in the genera *Steinernema* and *Heterorhabditis* are microscopic roundworms that enter the larval stage of insects that inhabit the growing medium (i.e. fungus gnats and black vine weevil) through natural openings such as the mouth, anus, or breathing pores (spiracles). Once inside the larvae, the nematode releases a bacterium that attacks the mid-gut, producing protein-destroying enzymes and causing septicemia within 24 to 48 hours. Beneficial nematodes complete their development within the host body, undergoing two to three generations inside the larvae, and then emerge as infective juveniles. The primary beneficial nematode species used against fungus gnat larvae is *Steinernema feltiae*, which is commercially sold as Nemasys, Entonem, or Scanmask. Beneficial nematodes do not have an extended shelf life – they should be applied immediately. Temperatures higher than 90°F reduce survival rate of the infected juveniles. If they cannot be applied immediately, then the beneficial nematodes should be stored for no more than a day in a refrigerator set at 38 to 42°F.

Additional Reading

Bell, M. November 2003. IGRs – A growing, but misunderstood group. Greenhouse Product News 13(2): 54-56.

Cloyd, R. A. April 2004. Don't get washed up using soaps. GrowerTalks 67(12): 54-56.

Cloyd, R. April/May 2004. Insect growth regulators do more than kill young adults. Greenhouse Business 10(4): 43-45.

Cloyd, R. A. November 2003. Do beneficial nematodes really work? GrowerTalks 67(7): 72-74.

Parrella, M. P., and B. C. Murphy. June 1998. Insect growth regulators. GrowerTalks 62(2): 86-89.

Ware, G. W. 2000. The pesticide book. W. H. Freeman and Company, San Francisco, CA.

Raymond A. Cloyd
University of Illinois
Department of Natural Resources and Environmental Sciences
National Soybean Research Lab
Urbana, IL 61801
217-244-7218
Fax: 217-333-4777
rcloyd@uiuc.edu

Michelle L. Bell
SePRO Corp
11550 N Meridian St, Suite 600
Carmel, IN 46032
317-580-8097
michelleb@sepro.com

Editor's Note: Ray Cloyd and Michelle Bell addressed this topic at the 2004 OFA Short Course. For more information about the Short Course or to order a CD-ROM of the educational sessions, please visit the OFA Web site at www.ofa.org.

Help Wanted

ofa Management

by Harold Lloyd

Have you ever asked what your employees want/need? Research of more than 1,000 supermarket employees, both full- and part-time, has revealed the following list of favorable job qualities: stimulating/fun, training/education, job security/fairness, recognition, salary/benefits, involvement/belonging, flexible schedule, more hours, opportunity to advance, and safe work.

What does your company do to satisfy those needs? Generally very little, from my observations. My many years as a retailer and now as a student of retailing have enabled me to identify the five most important management duties which deliver on all of the above needs/wants.

Using a 1-to-20 scoring range (20 being the perfect orientation process and 1 being just the opposite), follow along to see how your employee retention probability adds up.

1. ORIENTATION

A thorough, sincere orientation program builds the foundation of trust and respect between management and the new employee. Orientation components could include a formal "welcome" on the first day. Follow it with a store tour and assign a "buddy" to mentor the new recruit's first 30 days.

After two weeks, the same manager would call the employee at home between 7 p.m. and 8 p.m. to determine the employee's level of satisfaction with his or her new job. After 30 days, review the new recruit's goals in a formal setting. Then graduate the new hire to the level of associate. *Score yourself 1 to 20.*

2. COMMUNICATION

Communications seem to always get slammed by employees who complete attitude surveys. Store communications techniques are worth reviewing. For example, are you careful to not post threatening notices around the store such as "No tie, no name badge, no work!" or "Close door behind you!"? These seemingly harmless notes create a negative impression of management.

Do you have other effective communications techniques? (The best include a bulletin board, newsletter, regular employee meetings, payback notices, an advertised open-door policy, and employee focus-group sessions.) *Yes = 20 points. No = something less.*

3. DISCIPLINE

Do you deal with an infraction of a company policy swiftly, fairly, constructively, and progressively? Effective discipline must start out soft and simple, and progress to termination in a methodical, expeditious manner.

Step one is verbal conversation on the sales floor, but in private. Step two moves into an office but also should be verbal, with no record kept. Step three introduces the first write-up. Step four includes a write-up and a one-day suspension. Step five is the third write-up and the final step – termination. *Score yourself 1 to 20.*

4. RECOGNITION

Are you comfortable telling your teammates that you appreciate them and their efforts? Do you do it frequently? Simple programs of acknowledging birthdays or making an effort to call employees by their names instead of "young man" or "miss" go a long way, as do service award pins and award banquets.

A more obvious and often overlooked relationship-breaker is the employee break room. I find the correlation between great employee morale and a great break room is nearly 1:1. How can you say that your employees are your greatest asset if you expect them to sit in a "hell hole" you supply them for their breaks? You get the idea. *Score yourself 1 to 20.*

5. EVALUATION

Nothing positively affects an employee's attitude toward a company more than a thorough performance evaluation. A proper evaluation addresses all 10 associate needs and wants, directly or indirectly. It's an unbelievable return on an investment of a few hours per year, per associate. *Score yourself 1 to 20.*

Now add up your scores. This total represents the likelihood that you'll be able to retain the employees you have. In other words, a total of 72 means there is a 72 percent chance you will build your dream team.

But wait! Here are some bonus points: If you perform a structured and documented exit interview with at least 75 percent of the employees who leave your company, add 10 extra points to your score. You deserve those points because if you systematically capture feedback from exiting associates, you will better understand why they are leaving and have a better chance to fix what is broken.

Remember, it is your employees' job to take care of your customers. It is your job to take care of your employees.

Harold Lloyd
H. Lloyd and Associates Inc
2805 County Place
Virginia Beach, VA 23456
757-721-0017
Fax: 757-721-2648
hlloyd@aol.com

Exit Interviews Provide Employers with Valuable Information

by John Wargowsky

Mid American Ag and Hort Services (MAAHS) reminds employers that exit interviews can improve the working environment. An exit interview is a meeting conducted with the departing employee after the termination decision has been made and communicated. Employee termination may be voluntary or involuntary and in the case of seasonal employment, may occur annually.

Exit interviews can help employers determine the real reason behind a voluntary termination, explain the conversion or continuation of benefits, minimize misunderstandings and hard feelings caused by involuntary terminations, and facilitate appropriate administrative details. The interview can provide employers with insight on overall policies and procedures by obtaining feedback about the organization and its practices. The best time for an exit interview is a day or two before the employee's final separation.

It is best for a neutral party, not the departing employee's supervisor, to conduct the interview. This allows the process to be objective. This person should be familiar with the employee's personnel history and responsibilities of the position.

Exit interviews should be structured so all the important issues are covered, including both specific and open-ended questions. This allows the interviewer to collect job-related details along with more general feedback and opinions. Questions should vary depending on the type of information desired. However, exit interviews usually include standard types of questioning with appropriate follow-up questions based on the employee's responses.

Administrative items to cover include benefits, where to mail the W-2 form, the policy on providing references, employer property to be returned, removal of the employee's personal belongings, and agreements concerning competitive activities and disclosure of confidential information.

Another discussion point for employees leaving voluntarily is availability for future employment. Since many agricultural and horticultural businesses hire employees on a temporary or seasonal basis, this is a great time to gain commitment for the employee to return in the future.

All feedback received during exit interviews should be analyzed and considered for workplace improvements.

MAAHS is a nonprofit consortium of associations, organizations, and employers organized to improve the working and earnings environment for mid-American employers. Contact MAAHS to learn more about becoming an employer member and receiving assistance such as help planning for exit interviews.

John Wargowsky
Mid American Ag
& Hort Services Inc
PO Box 182383
Columbus, OH 43218-2383
614-246-8286
Fax: 614-246-8686
labor@ofbf.org
www.midamservices.org

Flexibility has been Key to Florist's Business

by Cheryl Cuthbert for Polly Agle

Flexibility and a willingness to try new things have been important components of how Polly Agle, owner of Hazel's Center City Flowers in Springfield, Ohio, does business. In 1991, after working at a flower shop and studying at Hixon's Design School, Agle purchased an existing shop (Hazel's Flowers and Gifts) in South Charleston, Ohio. In 2002, she opened Hazel's Center City Flowers as part of a downtown renovation project. Then, she decided in January 2004 to close the original store and maintain just one store – in the new location, and she completed the move by mid-March.

Moving Downtown

When the owner of an empty, but soon-to-be-renovated building in downtown Springfield, Ohio called Agle to see if she would like to rent a space for her retail florist business, it was a unique opportunity to expand her business. Could she do it, and did she really want to? Keeping one busy retail flower shop running smoothly can be a real challenge. Opening a second shop in an entirely different location – especially as part of a downtown refurbishment effort – would be an even bigger challenge.

Agle told the building owner she'd have to think about it – after all, downtown had been a struggling retail area, the space for her shop would be small and challenging to use well, and she had one shop to manage already. However, Agle was also flattered because the building owner could have called any of the 19 other retail flower shops in Springfield – and he'd called her first.

When Agle arrived to look at the space, most of the building had been closed up for 25 years. In fact, she had to take the plywood off the outer windows and look through a small hole to see what she'd be getting. But Agle took a chance, and she was the first tenant on the first floor to move into the building. There was a tearoom in

Continued on page 30

ofa Retail Florist

Flexibility has been Key to Florist's Business

Continued from page 29

the basement and a dance studio and hair salon on the second floor.

Agle is now part of something good in Springfield. "Our downtown is really coming back to life," said Agle. The building that her shop occupies downtown also houses two fitness centers, a day spa, a photography studio, a 1950s-style sandwich shop, a banquet room for corporate and private functions, and even part of Clark State Community College. The tenants of the building will be holding their first joint wedding show in November 2004. "We've got everything but the church in this building," said Agle.

The Springfield Center City Association, which has three full-time employees who continually work on improving the downtown, assists the tenants of Agle's building and other downtown shop owners. Downtown revitalization can be a lengthy process however. Getting people used to coming downtown can take a while, and parking is a challenge, said Agle. "It takes time to draw people here. Even now, rarely does a week go by without someone saying to me 'I didn't know you were here.'"

Expanding and Downsizing – At the Same Time

Having a second location meant Agle juggled a lot of responsibilities – maintaining inventory for both shops, scheduling employees, planning different advertising for each shop, creating a different look for downtown, considering two types of audiences, and even trying to be in two locations at once. "It was too much for me, something had to give," said Agle. She had two crews, too many employees, and too many expenses. A study of Agle's two stores, conducted by Wittenburg University, confirmed that she had more customers at her original location, but was making more money at the downtown location. The downtown store was simply more efficient and more cost-effective to run.

Agle was deciding she needed to do something different about the same time that a mortgage company in the space next to her downtown store moved out. That move opened up a large space behind the original store, which was only 40 feet by 16 feet in size. Agle leased the additional space, moved everything in, and closed the old store as of March 15. Construction will begin after Christmas 2004 to build a new room for bridal consultation, a walk-in cooler, and plenty of storage. After all, Agle is putting two stores' worth of everything in one place. "I haven't sold the other place yet, and that's hurting cash flow for a while, but at least I'm operating out of one location now," said Agle.

Taking Orders

Agle says the upheaval has been a challenge, but the change has been great. She has a very positive amount of orders, and her recognition within the downtown community is growing. One fear she had about leaving the South Charleston store was leaving behind the friendships with current customers. The old store was "home," and it had been there for 52 years total. The Hazel it was named for had opened the store, and Agle had been only the third owner. But, most customers have stayed with her, and "I have a great new group of customers too," she said.

The market is different downtown. The downtown customers are willing to pay more for some arrangements, they're expecting a little more, and they're paying for convenience, said Agle. "Of course, that means you have to BE a little better too."

"Our bread and butter is still a lot of wedding and sympathy work," said Agle. "We've booked up to three weddings within one weekend recently, and that might be too much for my size right now!" Most of Agle's business still comes in by phone, but the downtown store has quite a few walk-ins. A lot of browsers arrive at lunch time, and folks stop by on their way home from work, said Agle. "If the weather is good, people are on the sidewalks." An outdoor plaza often hosts parties directly across the street from Agle's shop, and she is also part of the local farmer's market. Downtown hosts a big Christmas show each year, and "Santaland" on the second floor of Agle's building brings in a lot of good traffic.

Hazel's delivers its own orders, using one driver and charging by distance. Agle said express delivery is rare for her shop. During the holidays, she uses two or three drivers. All orders are taken by hand and entered into the computer system for invoices and statements. An entire point-of-sale system would be great, said Agle, but she can't justify the expense right now.

Keeping Things Running

Agle now employs a total of three full-time and two part-time workers, including herself as the manager and head designer. Her other two designers are part-time, the bookkeeper is full-time, and the assistant/driver is full-time. Her husband, son, and daughter do help as needed. Agle has no formal incentive program for her employees, but her basic philosophy of "families first" has paid off in loyalty from her workers. She was also able to streamline her staff when she closed the other store, and that has helped balance her whole team.

The move/restructuring has been a wonderful growth experience for Agle. "I feel more in control of the 'whole deal' now, employees, inventory, what needs to happen each day," said Agle. She feels more empowered to deal with issues, and she's more focused with just the one location.

Staying on Top

Agle has some sound advice for other new business owners – find a business advisor right away and "hold on tight." With no prior management experience before she opened her first shop, Agle said she didn't realize she'd be "on demand" all day, every day.

Agle stays in control by comparing notes and sharing her knowledge and insight with other retail florists; and she

ofa News

stays in touch with industry trends. She attends several floral conventions and belongs to OFA, the Kentucky State Florists' Association, and the Society of American Florists.

Agle got involved in OFA several years ago with the encouragement of David Hale, Roman J. Claprood Co. in Columbus, Ohio. "I didn't know anyone involved before. I didn't think there was a place for retail florists," said Agle. However, she discovered a wealth of knowledge and an opportunity to see great designers. "Being involved with OFA has given me a confidence in myself and my business. I feel more professional." Agle now sits on the OFA decorations and retail florist committees.

She's also very active in her community as a 4-H club advisor and local church member, as a member of the Ohio CattleWomen's Association and the Ohio Horseman's Council, and through her family's farm activities such as hayrides, a pick-a-pumpkin patch, and pick-your-own raspberries.

Agle's enthusiasm for this profession, her visibility in her community, and her flexibility in making changes to help her business grow in the right direction are great examples of how one person CAN work within today's unique marketplace and be successful.

Polly Agle
Hazel's Center City Flowers
14 E Main St
Springfield, OH 45502
937-322-5302
Fax: 937-322-5303
hazels@erinet.com

Former OFA President Receives Award

Justin Marotta, president of OFA from 1997 to 1999, was recently honored with the 2004 Dan L. Heinlen Award by The Ohio State University (OSU) Alumni Association. This award was presented to Marotta for his many efforts on behalf of horticulture at OSU and the horticulture industry in general, even though he never attended or worked for OSU.

Shortly after Marotta was elected president of OFA, he became involved with the national and international initiative that resulted in the Ornamental Plant Germplasm Center (OPGC) located at OSU. The OPGC opened after Marotta garnered the support of the Society of American Florists and the American Nursery and Landscape Association to lobby the federal government to contribute $500,000 annually to the center. "It is difficult to estimate the dollar value this center will have to Ohio State and the floriculture industry in the future, but it will be significant," said Miller McDonald, an OSU Department of Horticulture and Crop Science faculty member. "The OPGC exists today at Ohio State because of Justin's vision and leadership."

Marotta later played a leading role in an internal review of the Department of Horticulture and Crop Science. A Horticulture and Crop Science Advisory Board was formed at OSU after Marotta served on the Ohio Plant Agriculture Task Force. Marotta has also served on a departmental chair search committee and the Vice President's Advisory Council, the advisory body for the dean of the OSU College of Food, Agricultural and Environmental Sciences.

Marotta owns Possum Run Greenhouses in Bellville, Ohio; and he continues to volunteer for OSU.

OFA Member Benefits

- OFA members receive a 20 percent **discount on all *OFA Tips*... books**, now distributed exclusively through Ball Publishing. Members also get a 20 percent discount on all Ball Publishing titles. Visit www.ofa.org or www.ballbookshelf.com for more information. Proof of membership will be required for the member discounts. Each OFA member's id number is listed on their *OFA Bulletin* label. The newest OFA publication is *Tips on Managing Floriculture Crop Problems*, available since April. *Tips on Operating a Profitable Greenhouse* will be released this fall.
- The ***APPI Savings Solution Program*** identifies and implements options that reduce the costs of a company's energy, utility, and telecommunications services. You choose which services best suit the needs of your business. These services include electricity, natural gas, water, recycling, waste removal, freight, credit card processing, and voice and data communications. For OFA members who choose to use APPI, there are no up-front, hourly, or retainer fees. APPI, an independent utility consulting firm, is compensated only when it delivers savings and/or refunds. To get started, APPI will perform a free audit of your company's energy, utility, and telecommunications bills. For more information, call 800-520-6685, e-mail: info@appienergy.com, or contact OFA.
- Ohio-based members of OFA can participate in the **OFA worker's compensation group rating program**. Cost control and claims management are the keys to enabling OFA members to save significant premium dollars through this program, which is administered by Compensation Consultants Inc. (CCI). For more information or a no-cost, no-obligation quote, contact Cathy Bennett at CCI – phone: 800-837-3200, ext. 7106, e-mail: cathy.bennett@ccitpa.com, or online at www.cciworkerscomp.com.

ofa News

Recent OFA Outreach Programs

In October, garden center industry consultant Ian Baldwin presented his **Retail Sales Pro Workshop** at HJ Benken in Cincinnati, Ohio, and at Wenke Greenhouses in Kalamazoo, Michigan. The focus of this workshop was to train sales staff about retail trends, whom their customer is, and how to help customers spend more money. The Scotts Company sponsored lunch for both workshops. Breaks were sponsored by: HJ Benken Inc, Cincinnati Flower Growers Association, and Mollema.

A grower-focused seminar on **Technology, Automation, and Greenhouse Efficiency** was held in Stillwater, Oklahoma in cooperation with the Oklahoma Greenhouse Growers Association, and in Lansing, Michigan in conjunction with the Michigan Greenhouse Growers Expo. The program addressed the challenges that small- and medium-sized growers face in incorporating technology and automation into their ranges to improve efficiency and profitability.

Hosts for the workshops were the Oklahoma Greenhouse Growers Association and Michigan State University. Sponsors for both seminars were: OFA, Argus Control Systems, Bartlett Instrument Co, Blackmore Co, Bouldin & Lawson Inc, Branch-Smith Publishing/ *GMPro*, Nexus Greenhouse Systems, Priva Computers Inc, Qcom Corp, and TrueLeaf Technologies.

OFA Event Calendar

February 18-20, 2005	OFA Board & Committee Meetings – Columbus, OH
July 9-12, 2005	OFA Short Course – Columbus, OH

Schedule Update

The OFA Board of Directors recently voted to adjust the ending date of the 2005 OFA Short Course from Wednesday, July 13 to Tuesday, July 12. The educational sessions previously offered on Wednesday will now be available on Saturday, July 9.

Remember to circulate the *OFA Bulletin* among your staff members. This information is designed to be valuable for all areas of your business.

www.ofa.org

ofa
an Association of Floriculture Professionals

2130 Stella Court
Columbus, Ohio 43215-1033 USA

Address Service Requested

NON-PROFIT ORG.
U.S. POSTAGE
PAID
COLUMBUS, OHIO
PERMIT NO. 644