



# CORF News

California Ornamental Research Federation

Vol. 2, Issue 1

Winter 1998

## Optimal Irrigation of Greenhouse Crops

*Submitted by Heiner Lieth, Environmental Horticulture  
University of California, Davis*

Conventional irrigation practices of greenhouse plants are generally designed around the idea that water is cheap and plentiful and that the rooting medium should become completely saturated at each irrigation. Potting media are designed so that they drain well, allowing excess amounts of water to drain away rapidly. Also, some excess irrigation frequently is justified to leach any undesirable salts from the root zone.

Since there is no such thing as a completely uniform irrigation system, there will be a plant within each irrigation circuit which receives the least amount of water.

The customary practice is to irrigate in such a way that even this plant receives a full irrigation including the leaching treatment. As a result,

the other plants will receive more water than they need. Thus it is common in the industry to apply considerably more water than is actually needed for optimal plant growth.

In one irrigation study at UC Davis we found that we could reduce conventional irrigation amounts by 80% and still produce decent-looking plants.

In another study in several commercial greenhouses, with a variety of potted crops, we found that growers had the potential to generate savings in applied water and fertilizer ranging from 25% to over 95%.

The degree of savings tended to depend on how seriously irrigation was taken. The nurseries that did not have an employee accountable for

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## Growers Comment on Increasing Competition

*Submitted by Dr. Karen Robb  
UCCE San Diego Regional Advisor*

“What are you doing to enhance your ability to compete with increasing foreign (and/or domestic) competition?” was recently asked of a diverse group of growers.

**Stuart Kitayama, of Kitayama Brothers Nursery, Watsonville,** responded “Foreign competition has changed the face of our industry. We at Kitayama Brothers have addressed this by focusing on things we can control. This means improving our operations, facilities, and standards.

“We are re-evaluating all our current practices, facilities, and plants. Over the past several months we have built a strong management team and have improved our accounting and quality measurement systems. Thus, with this strong foundation, we are very optimistic as we enter 1998 that we

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## Methyl Bromide Buffer Zones

*by Lee Murphy, President, California Cut Flower Commission*

Concerns about wintertime weather stability promoted the Department of Pesticide Regulation (DPR) to evaluate applications of methyl bromide between December 1996 and February 1997. The study appeared to demonstrate that weather stability during the winter months increases methyl bromide concentrations. This study led to a letter being sent from DPR to the County Ag. Commissioners on July 18, 1997 recommending drastically larger

buffer zones for winter applications of methyl bromide.

The California Cut Flower Commission (CCFC) responded by requesting a joint meeting between DPR, California Department of Food and Agriculture (CDFA), the Crop Protection Coalition, and other concerned groups. This meeting was held in Sacramento on September 4, 1997. The CCFC was able to explain

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**Growers Comment**  
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will attain our goals of improved productivity, efficiency, and overall flower quality.”

**Scott Sumi, Sales Manager at Coast Nurseries, Inc.**, Somis states that Coast Nurseries has been able to compete through a combination of approaches. First they identified a niche market – bedding plants. Second, they have a diverse customer base and product line. They get new customers by being at the right place at the right time, but they maintain these accounts through quality and service. The sales staff excels in customer service. “Quality is very important because if the plants don’t hold up, customers are unhappy.” To ensure quality and customer relations, Coast Nurseries offers a guaranteed sales program, which replaces for free everything that doesn’t sell or looks bad. Finally, Coast Nurseries tries to stick with what they know they can do well without compromising quality or service.

**John Kister, of Sunlet Nursery, Fallbrook**, states that he and Janet

Kister found their niche by making the conscious decision to specialize in growing crops that others find too difficult to grow. Producing difficult to grow plants, and providing excellent quality and customer service are what keeps Sunlet Nursery competitive.

When asked how the relaxation of Quarantine 37 would impact the potted plant industry, John replied that the concern with Q37 relaxation is not regarding increased competition, but the threat of introduced pests. “We have all heard the horror stories of introduced pests and have seen the impact of pests that have been missed by the quarantine procedures that are currently in place.” John believes that relaxing of Q37 would actually increase the variety of plants grown in the U.S.; the majority of the plants shipped into the U.S. would probably be young plants to be finished here.

**Cees Dobbe, of All Seasons Flowers in Arroyo Grande**, produces greenhouse and field grown cut flowers. To remain competitive,

Cees follows a motto coined by a well-known business man, “If you throw a lot of pebbles in the water, occasionally you will hit the target.” According to Cees, “There are no magical solutions to beating foreign competition, you have to hit it with everything you’ve got.” Here are some of the many things that All Seasons strives to do. 1) Grow what the customer wants and be sure that it provides the greatest value to the customer. This could be better quality or better service. 2) Invest and reinvest in technology. “With current technology you can produce top quality product at the right time.” 3) Try new things all the time, both in growing crops and in marketing them. Get new ideas by going to meetings, keeping up with the literature, and getting involved in grower associations. 4) Prioritize. Don’t go to so many meetings that you don’t have time to implement the good ideas you learn from them. Don’t neglect the basics necessary to the survival of your business.

## **Agricultural Resources**

**UC Sustainable Agriculture Research & Education Program (SAREP)** 916/ 752-7556

University of California

Davis, CA 95616

<http://www.sarep.ucdavis.edu/>

email: [sarep@ucdavis.edu](mailto:sarep@ucdavis.edu)

*Research and educational information on sustainable agricultural growing methods.*

**UC Statewide Integrated Pest Management Project**  
916/752-8350

Statewide IPM Project  
University of California

Davis, CA 95616

<http://www.ipm.ucdavis.edu>

Sec. email: [tekuhn@ucdavis.edu](mailto:tekuhn@ucdavis.edu)

*Develops research to advance integrated pest management.*

*Publications available on many agricultural crops. Floriculture IPM manual tentatively set for publication end of 1998.*

**Fertilizer Research & Education Program, CA Depart. of Food & Agriculture (CDFA-FREP)**

916/653-5340

1220 N. Street, P.O. Box 942871

Sacramento, CA 94271

<http://www.sarep.ucdavis.edu/frep/>

email: [ccady@smtp1.cdfa.ca.gov](mailto:ccady@smtp1.cdfa.ca.gov)

*Research and educational programs to develop the efficient use of fertilizers.*

**Dept. of Pesticide Regulation, CA Environmental Protection Agency (DPR, EMPM Branch)**

916/324-4100

1020 N. Street, Room 1651

Sacramento, CA 95814

<http://www.cdpr.ca.gov/>

*Regulation of pesticide use and resource for pesticide information.*

**Energy in Agriculture Program, CA Energy Commission (CEC)**

916/654-4019

1516 Ninth Street, MS 26

Sacramento, CA 95814

<http://www.enery.ca.ov/energy/agprogram/>

*Research to minimize energy use in agriculture. Los cost loans for investment in energy-efficient equipment and structures.*

## Internet Sites of Interest

*Dr. Heiner Lieth, Environmental Horticulture, UC Davis*

The Internet has a number of uses. Perhaps the most important of these is the ability to find information. There are a number of services available (at no cost) that you can use. Each can be tapped into through a specific home page on the WWW. The computer programs, called "search engines", do things a little differently so that it is worthwhile to check out several services to see what works best for you.

The most common method used by these services is the indexing of information that exists on the WWW. Basically the computers go through millions of web pages automatically and continuously, by starting with a list of pages, and following every link that it finds on each of these pages. For each word that is encountered it makes a note in a database that tells it where that word was found. Then when you want to find some information, the service checks this index and lists back to you what it has.

Let's look at an example. Let's say

we are interested in regulatory information on "methyl bromide" for field flower production. You could use various search engines (services) to do this. To use, for example, Alta Vista, tell your browser to go to <http://altavista.digital.com/> and then, somewhere in all the advertisement, you will see a box like this: Type in the words methyl bromide and click on "search".

Within seconds you will get a list of links. When I do this I get a statement that 9371 pages were found where these words occur. The list starts with the first ten "hits" and at the bottom you can request the next ones. For each hit you get a brief 2-line bit of text off the page where the words were found. You could theoretically check out all 9000 hits, but you would probably find a lot of stuff you are not interested in. A major part of this is because it has found all pages where the words "methyl" and "bromide" occur, regardless of whether they were next to each other and in that order. To

overcome this you could use quotes around the words to identify exactly how you want the words to be. For example, when I specified "methyl bromide" (with the quotes) then I got only 6776 hits. Since this is still a lot more than what one can digest in a reasonable amount of time, we will want to limit our search further. If we do this by searching for (note the quotes): "methyl bromide" "cut flower", then this results in some 2000 hits and we can readily tell by the first ten hits that we are getting the sort of thing we're looking for. Note that you can also click on "refine" and get help in limiting the search in various other useful ways. If you want to play with other services, then you can find a list of them by instructing your browser to do a "Directory", "Internet Search"; in Netscape Navigator this links you to: <http://home.netscape.com/escapes/search/ntsrchrd-2.html> From there you can pick any of a variety of search engines.

## Domoto Family Inducted into Floriculture Hall of Fame

Representatives of the Kee Kitayama Research Foundation and the California Ornamental Research Federation announced that the Domoto Family has been selected to receive the 1997 California Floriculture Hall of Fame Award. Established in 1986, the award recognizes innovative spirit, outstanding achievement and permanent contributions to the floral industry in the areas of production, marketing, transportation, research and legislative activity.

The Domoto Family have been growing flowers and plants in California since 1885 and were instrumental in founding the California floriculture industry as we know it today. Their

nursery started 112 years when Kanetaro and Takanoshin Domoto pooled their hard-earned money and experiences and rented a small plot in Oakland, California. Several years later, the Domoto Brothers sent for their younger siblings to help them with their nursery. In 1892, the brothers purchased two acres of land in the Melrose District of Oakland. As their hard work continued, the Domoto Brothers were able to purchase even more land.

In addition to growing and importing flowers and plants, the Domotos also educated immigrants from their hometown in Japan. Whenever one of the brothers visited Japan, he would bring

with him an eager student. Soon the Domoto Nursery became known as the "Domoto College." Although no longer involved in production, the Domoto family's contributions to the industry are extensive.

Over 75 people were on hand to induct the Domoto Family into the California Floriculture Hall of Fame on December 3, 1997. Following the dinner, their name was added to the plaques at the San Francisco Flower Market, the Los Angeles Flower Market, and the San Diego International Floral Trade Center, listing all past inductees.

For more information regarding the Hall of Fame Awards Program, please contact the California Ornamental Research Foundation at 760/723-0807.

## Field Observations

### New Pest & Diseases

#### Hybrid Statice Struck by Downy Mildew Disease

Hybrid Statice, both the Misty and Fantasia series, have been attacked by a new fungus introduced to the central coast. I am now familiar with five different downy mildew outbreaks occurring this past Fall in both greenhouse and field-grown crops.

Initial symptoms consist of light green to yellow, irregularly shaped leaf spots. As the disease progresses, these spots grow together and become brown. Leaf tissue eventually can wilt and die. Under damp conditions, the fungus produces masses of purple to gray clumps of spores on the bottom-side of the leaf.

The disease is caused by *Peronospora statices*, a fungus that was reported in 1997 in Italy, The Netherlands, and the United Kingdom. It is not clear as to how it was introduced to California.

Ideally diseased leaf tissue should be removed from the plants and disposed since resistant spores in the leaf tissue could germinate and start new infections in a moist environment. In a greenhouse, the environment should be modified to keep humidities low enough to reduce condensation. Fosetel-Al (Aliette) or mancozeb (such as Fore or Dithane WF) are registered products for downy mildew control.

## Regional Report

### Santa Cruz & Monterey Counties

#### Arched-Trained Greenhouse Roses in Soil Culture: Production & Quality Test Results



Dramatic changes in training techniques for cut greenhouse roses are taking place in California. Rose

growers are improving their ability to manipulate rose crop productivity and quality through a novel plant-training system known as "bending" or "arching". This training technique was first incorporated into "hydroponic" systems, but it is the observation of several innovative growers, that this training system could also be adapted for use for conventional "soil-grown" roses.

Granted, there are significant advantages of the hydroponic growing technique, but starting hydroponics is expensive. For those growers not financially able or ready to develop hydroponic systems with arching, it might be a reasonable "first step" to start the arching technique in existing greenhouse plantings, if it worked well.

I just completed a year long study to evaluate the production and quality of 5 rose varieties grown with both training systems, side by side. The roses had been grown in the ground for about 8 years with conventional training before selected beds were arched for the experiment. The crops were trained by the grower for several months before production and quality recording began. All the production was counted from each test bed daily. Every two weeks, the harvested stems were collected from each test bed and 25 stems were randomly removed and measured for stem length and fresh stem weight. The five tested cut rose varieties were: 'Delores', 'Hotspot', 'Moonlight', 'Obsession', and 'Romance'.

After 1 year, the average production in the arched-trained roses were 12-18% more in 'Delores', 'Moonlight', and 'Romance' than production in respec-

tive conventionally trained varieties. It was 2% higher in 'Obsession'. But production was 14% lower in 'Hotspot'. The quality was generally higher in arched-trained roses. Average fresh weight of the cut roses from arched plants increased 2.9 - 9.2% for all varieties except 'Delores'. There was a decrease of 8.8% in 'Delores'. Average stem length increased slightly 1.3 - 3.7% in 'Hotspot', 'Moonlight', and 'Obsession' and decreased slightly 0.7 - 0.8% in 'Romance' and 'Delores' from arched roses.

In summary, arched 'Moonlight' and 'Obsession' seems to benefit greatly from arching, with increased production and quality. 'Hotspot' responds favorably with increased quality but with a significant loss in production. Conversely, 'Delores' responds with increased production but with a significant loss in quality.

There seems to be a great potential for selecting other varieties that respond positively to arching. A grower might want to train responsive varieties with the arching system to improve quality even though some production is lost. On the other hand, a grower might want to gain some production but lose a little stem length in some suitable long-stemmed varieties. Some arched varieties might respond from arching with increased production and quality, a win-win situation.

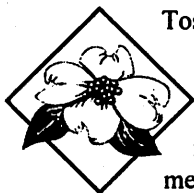
Remember, the person making the training cuts in both systems will ultimately influence the outcome of the training system. The grower must test, observe and react to how the plant responds.

Steve Tjosvold  
UC Cooperative Extension  
1432 Freedom Blvd.  
Watsonville, CA 95076-2796  
Phone: (408) 763-8040  
Fax: (408) 763-8006  
e-mail: [satjosvold@ucdavis.edu](mailto:satjosvold@ucdavis.edu)

# Regional Report

## San Diego County

### Tomato Spotted Wilt Virus Monitoring in Ornamental Crops. A Research Update



Tospoviruses, such as tomato spotted wilt virus (TSWV), have a huge host range, including numerous ornamental and vegetable crops, as well as several common weeds. These viruses are transmitted by certain species of thrips. Since there is no cure for the virus once a plant is infected, current control recommendations are to rogue infected plants and to control (infective) thrips.

Contrary to popular opinion, not all thrips are transmitting tospoviruses. To become infective, a thrips must feed on infective plant tissue while still in the immature stage. Once the thrips has become an adult, it can transmit the virus to healthy plants by feeding for as little as 15 minutes. The thrips is capable of transmitting the virus throughout its adult life. A thrips which did not feed on an infected plant while immature cannot acquire and transmit the virus as an adult.

In a crop such as ranunculus, which can tolerate a substantial amount of thrips feeding, the presence of even a large population of thrips does not necessarily indicate a problem. Thrips are a problem in this crop if they are transmitting TSWV. Lacking an accurate monitoring tool, however, most growers have viewed all thrips as potential vectors of TSWV. This can result in unnecessary pesticide costs and applications.

Monitoring for thrips and tospoviruses has traditionally consisted of sticky traps and plant samples for thrips and visual assessments of the plants for virus symptoms. An additional tool in monitoring for infective thrips involves the use of petunia indicator plants. Dr. Diane Ullman, Entomology Professor at University of California, Davis, her lab, and Dr. Karen Robb, Floriculture and Nursery Crops Farm Advisor, San Diego County, and her assistants have been cooperating on a project to evaluate the use of petunias as an indica-

tor plant for TSWV in ranunculus fields. They are currently expanding this project to include other tospovirus susceptible ornamental crops.

#### Why use petunias?

Selected cultivars of petunias, e.g. Cascade Blue, Summer Madness, and Blue Carpet, show distinctive and characteristic local lesions when infective thrips feed on them. These lesions are apparent in 3-5 days. In many plants, such as chrysanthemums, TSWV may be transmitted to the plant at any time, but symptoms are not expressed until the plant sets buds. If you are relying solely on symptoms to indicate a virus problem you will probably not respond soon enough to limit the spread of the disease. The rapid appearance of local lesions on petunias allows for a timely response in thrips control strategies.

Petunias are not a suitable host for western flower thrips development, so larvae do not survive. Remember that a thrips must feed on an infected plant as an immature to acquire the virus. Thus, the petunia plant can't serve as an additional source of virus in the field.

#### How are the petunias used for monitoring?

The petunias are grown in an area isolated from thrips and tospovirus sensitive plants. This isolation is essential. Otherwise, you won't know whether the lesions are from the production area or the propagation area. The plants are used while they are still relatively small, in a 3 1/2 inch pot. All the flowers are removed from the plant before placing them at the monitoring station, since

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*Karen L. Robb  
UC Cooperative Extension  
5555 Overland Avenue, Bldg. 4  
San Diego, CA 92123  
Phone: (619) 694-2857  
Fax: (619) 694-2849  
e-mail: klobb@ucdavis.edu*

## Field Observations

### New Pest & Diseases

#### Chrysanthemum White Rust

We had our first find of chrysanthemum white rust in this county in 1997. Extensive surveys by the San Diego County Department of Agriculture, Weights, and Measures earlier this year found only one grower with this pest problem. Following Federal protocols, surveys of all chrysanthemum growers in the county were initiated in December. To date, no growers have been found with chrysanthemum white rust.

#### Leafminers and Thrips

These two insect pests remained at higher than usual population levels further into the late fall and early winter of 1997. If predictions of milder than usual winter weather (in terms of temperatures) hold up as a result of El Nino, growers need to be prepared for an earlier problem with these pests in the spring.

#### Botrytis

If the predictions of increased rain hold for this season, growers need to be increasingly vigilant about *Botrytis*. This is especially true for field flower growers. Flowers that have been harvested following a rain may look great at harvest and packing, but arrive at the final destination a gray mass of mold. Avoid credits by protecting your flowers with fungicides just before wet periods.

## Field Observations

### New Pest & Diseases

**Diamondback Moth on Stock Flowers.** As in many areas of California, the larvae of the diamondback moth have been destroying stock plantings in San Mateo County.

In addition to stock flowers, the moth damages broccoli, cauliflower, and other brassica crops. Resistance to conventional pesticides has made control of the larvae difficult.

Damage occurs when larvae of the diamondback moth feed on leaves and new growth of plants.

Production is greatly reduced when feeding occurs on young plants, and quality drops when feeding occurs on mature plants.

New insecticides for worm control are needed for larvae control, but some of them are not labelled for stock flowers.

The pesticide Conserve is labelled for stock flowers, and seems to work well on diamondback moth, but some growers feel that it is too expensive to use on stock flowers.

There is a Section 18 for Success (spinosad) on brassica crops, but it is not labelled for stock flowers.

Bill Chaney, Entomology Farm Advisor in Monterey County, suggests that in addition to Conserve, growers should look at some of the new B.t. (*Bacillus thuringiensis*) pesticides, which have been working well on cole crops. Older B.t. products such as Dipel may not work well on diamondback moth larvae, but new B.t. products such as Match (Mycogen Corp.) may work very well. Always check the label to make sure that the product is labelled for your specific crop.

The trick to using B.t. products successfully is to use them early, in the younger instar stages, before diamondback moth larvae get large. With any pesticide, spray coverage is critical for diamondback moth control, especially on the underside of leaves.

## Regional Report

### *San Mateo & San Francisco Counties*



#### Water Quality Issues

Water quality issues related to agriculture on the Central Coast are being addressed in a series of regional workshops sponsored by the Monterey Bay National Marine Sanctuary.

The Monterey Bay National Marine Sanctuary extends 360 miles, from the San Francisco Bay south through the Monterey Bay, and down to Cambria, CA. The sanctuary includes 11 adjacent watershed areas.

Three workshops for growers were held recently in Half Moon Bay, Salinas, and Watsonville, and grower input was received on how to address water quality related to agriculture.

So far, 40 strategies have been developed for addressing water quality issues. Issues of concern to agriculture include erosion/sedimentation, nutrients, pesticides, and microbial contamination.

Strategies relating to best management practices (BMPs), technical information/outreach, and public education/public relations have been developed, and are being reviewed according to feasibility, economic and social impacts, and effectiveness in improving water quality.

Future workshops will address regulatory coordination/streamlining, funding and incentives, and tax policies.

A detailed water quality protection program (WQPP) action plan for agriculture and water quality will ultimately be developed for government agencies, private agencies, and the agricultural community.

For growers who are not familiar with the project, but would like more information on the project and/or

workshops, please contact the Monterey Bay National Marine Sanctuary at (408) 647-4201.

#### 1997 Census of Agriculture

The National Agricultural Statistics Service (NASS) of the U.S. Department of Agriculture conducts its Census of Agriculture every five years. Growers, farmers, and ranchers should have received Census of Agriculture forms in mid-December 1997.

Please complete one form per farming operation by February 2, 1998 to help complete an accurate census. All information is confidential and used only for statistical purposes.

Why complete the census??? The agricultural community has a lot to gain from an accurate census.

Data is used by:

- Farm organizations to develop programs and policies for agricultural producers
- Elected representatives to develop programs to protect U.S. agriculture
- Universities to develop research programs to increase agricultural production
- State Depts. of Agriculture to plan for drought and emergency outbreaks of pests
- Electric companies to forecast future energy needs for agricultural communities
- Public and private analysts to project results of programs

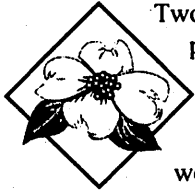
For customer service information on the census, call NASS at (800) 727-9540.

*Dr. Ann I. King*  
UC Cooperative Extension  
625 Miramontes, Suite 200  
Half Moon Bay, CA 94019  
Phone: (650) 726-9059  
Fax: (650) 726-9267  
e-mail: [aiking@ucdavis.edu](mailto:aiking@ucdavis.edu)

## Regional Report

### Ventura & Santa Barbara Counties

#### Educational events.



Two successful CORF programs were recently held in Santa Barbara County. There were 103 participants at the CORF Grower

Tour and Research Demonstration meeting in Carpinteria. We toured Brand Flowers, Westerlay Roses, Sterling Nursery, and the new lisianthus greenhouse at Sunshine Floral. Presentations and demonstrations were provided by UC researchers, including Heiner Lieth, Rick Redak, Diane Ullman, Cheryl Wilen, Heather Costa, and Julie Newman. The event was co-sponsored by Agrodynamics, AgRx, Central Coast Farm Credit, PanAmerican Seeds and Rohm and Hass. On October 21 we had a scouting training meeting in Goleta at Central Coast Wholesale Nursery in Goleta co-sponsored by the California Association of Flower Growers and Shippers and the California Cut Flower Commission. There were 22 people registered for the English session and 30 for the Spanish session. We would like to thank all the growers who hosted these programs and the sponsors whose generous donations insured excellent programs at reasonable costs for participants.

**Research Update.** We completed the second year of IPM scouting demonstrations as part of a statewide project with farm advisors Karen Robb, Steve Tjosvold and Ann King (see last issue for details). We had excellent results on 2 bedding plant crops in Ventura County. The total cost per month on petunias for our scouting program over a 26 week period was ½ the cost of the conventional program and only used 8% the conventional amount of spray material. The total cost per month for our scouting program on primrose over a 10 week period was ½ the cost of the conventional program and only used 1/3

the conventional amount of spray material. These savings were achieved without reduction in plant quality. We also examined scouting programs which emphasized the use of biological control on cut gerberas at Gold Coast/Vanko Nursery, Oxnard and on 4- inch poinsettias at Coast Nursery, Somis. The program on gerberas combined the use of BotaniGard (a biopesticide) with the use of 2 parasitoids (*Encarsia formosa* and *Eretmocerus californicus*) for control of greenhouse and silverleaf whitefly. *Amblyseius cucumeris* and *Hypoaspis miles* were used for control of western flower thrips. Natural populations of *Diglyphus begini* were found working on leafminer. This program resulted in a significant reduction in cost as compared to the conventional program. Although the use of natural enemies is often considered expensive, we found that this was not the case when a regular monitoring program minimized broad-scale application of beneficial arthropods and pesticide sprays. In the poinsettia scouting program, we used BotaniGard, *Eretmocerus*, and *Encarsia* for greenhouse and silverleaf whitefly control. Although the cost on poinsettias for the biological control/scouting program was 18.5% higher, this resulted in only 1¢ more per pot. We believe we can fine-tune this program next year so that the cost is equal or less than the conventional spray program. In both the gerberas and poinsettias, the quality of crops using the biological control/scouting programs were comparable to the crops using the conventional programs.

Julie P. Newman  
UC Cooperative Extension  
669 County Square Drive, Suite 100  
Ventura, California 93003-5401  
Phone: (805) 645-1459  
Fax: (805) 645-1474  
email: [jpnewman@ucdavis.edu](mailto:jpnewman@ucdavis.edu)

## Field Observations

### New Pest & Diseases

#### Crown rot disease of lisianthus

This is a new disease on lisianthus caused by *Fusarium avenaceum*, first reported in 1996 in Monterey County. Symptomatic plants appear dull green and water-stressed. Leaves and growing tips wilt, eventually collapsing. Plant crowns and lower stems rot. Crown leaves, lower leaves and stems become light tan. There are no current UC fungicide recommendations; experimental research showed that Medallion and Domain-Chipco treatments helped reduce this disease, but did not prevent it. Plant breeders are working on disease resistance. In the meantime, start with clean plant material. Don't re-use infested trays used in transplanting or place plants in empty cells where diseased plants used to be; remove diseased plants.

**Diamondback Moth (DBM)** This has been a major problem on stock in northern Santa Barbara County. Larvae generally feed underneath the leaf, making small, irregular holes while leaving the upper leaf epidermis intact, giving a window-like appearance. Feeding may reduce yields and exacerbate botrytis. Weeds such as mustard and other crucifers must be controlled, as they are alternate hosts and may contribute to re-invasion. Severe pesticide resistance was a problem up until the recent registration of Conserve. Monitoring methods include visual plant inspections for the larvae and the use of pheromone traps for the adults. Phil Phillips, UC IPM Advisor in Ventura county, reports some success with puffers that disrupt mating by saturating the environment with DBM sex pheromone. He has written a county publication on DBM which you can receive by contacting me.

## Irrigation

*Continued from page 1*

good irrigation were the ones with the most waste. In these places irrigation was done "on the side" along with other activities (e.g. packing, spraying, etc.). This was not optimal for the crop since irrigations almost always came too late or too early and were always too long. Development of an optimal irrigation strategy is based on knowledge of the effects of non-optimal irrigation.

Irrigating with too little water after letting the root zone run dry may result in a zone in the pot which is too dry for roots to survive, resulting in root loss in these areas. As a consequence, the potential for nutrient and water uptake of the plant is diminished, probably resulting in poor growth and increased disease potential. With fertigation, inadequate amounts of water also mean inadequate amounts of applied fertilizer, unless the injection system is adjusted to compensate for this.

Irrigation amounts applied in excess of what the rooting medium can hold generally has no detrimental effects on the crop if the medium is designed to hold a lot of water while still retaining a significant amount of air space. Most commercial mixes are designed this way. However, if you use a mix that is not formulated with this in mind, then it is possible to over-irrigate. If this occurs, then this may result in water logging, which involves inadequate oxygen for the roots.

Even if excessive watering is not a problem for the plants, it does represent wasted resource (purchased water and fertilizer). Furthermore you may be held accountable if the discarded fertilizer ends up in the local drinking water.

The key to optimal irrigation is to know:

1. When the root zone of a typical plant has reached a level of dryness where it is ready to be watered, and

2. the point during an irrigation where the medium has become wet enough so that the irrigation can be stopped.

At the University of California we have done research into sensing moisture content of growing media and using this for making irrigation decisions in greenhouse production. We use a tensiometer to monitor the moisture conditions in the root zone. Once some dry threshold is reached, an irrigation is scheduled. During the irrigation the media moisture level is monitored until some wet threshold is reached. At that point the irrigation is stopped.

Our studies have shown that this type of control can be automated and that it can be used to produce quality plants.

Our experience in these studies leads to several specific recommendations

regarding irrigation in greenhouse production:

1. Put someone in charge of irrigation and clearly establish that this task has a high priority. This person should be familiar with the water-use of the various crops and the evaporation potential throughout the nursery (shady spots, draughty spots, hot spots, etc). Incentives should be used for reinforcement so that this person will realize that the intelligent use of these skills is appreciated.
2. Make the irrigation system as uniform as possible. This is the first place to start making adjustments in an irrigation system. There is little use in pursuing high levels of water-use efficiency if the system is not

*See Irrigation - Page 9*



## Grower Tour to Washington & Vancouver March 26 - 29, 1998

Join CORF in the beautiful Pacific Northwest on a 3 day tour of greenhouses, nurseries and flower markets including:

### *In Washington*

Molbaks  
Washington Bulb Co., Inc.

Skagit Gardens  
WSU Mt. Vernon Research Unit

### *In Canada*

United Flower Growers Cooperative  
(a Dutch-style flower auction)  
Smit Greenhouses  
Flora Farms  
Kanaka Greenhouses

Brookside Greenhouses  
Hollandia Greenhouses  
Nordic Greenhouses  
Xenios Dutch Growers

On the growing side: we will tour production areas including potted cyclamens, perennials, orchids, and a wide variety of bulbs and cut flowers, hydroponic systems, stem bending, ebb & flood gutter benches, state of the art coolers used to force perennials out of season

On the marketing side: we will tour several successful growers who operate garden centers selling direct to the public and the busy United Flower Growers flower auction & market.

Evenings, you are on your own!

Contact the CORF office for registration information. 760-723-0807



## Irrigation

*Continued from page 8*

- delivering the same rate and quantity to each plant.
3. Install sensors, such as tensiometers, which allow determination as to whether a crop needs water. Simply lifting the pot to assess its water content provides some useful feedback (and is better than nothing), but gives only very rough estimates of water content. Irrigate based on crop need, rather than convenience or guesswork. Leach only when necessary as indicated by test results relative to crop requirements and tolerances.
  4. During an irrigation, monitor water delivery and stop irrigating at the proper time. This can be done by using a jar marked as a gauge to track the amount applied. It can also be done using tensiometers equipped with "high-flow" ceramic tips.

### Article Credits:

Heiner Lieth

Environmental Horticulture  
University of California, Davis  
Davis, CA 95616-8587  
Phone: (530) 752-7198  
Fax: (530) 752-1819  
e-mail: [jhlieth@ucdavis.edu](mailto:jhlieth@ucdavis.edu)

## Advertising Information

Your advertising dollars support the publication of this newsletter. If you would like to advertise in *CORF News*, contact the CORF office at 760/723-0807 for an advertising insertion order and submission deadlines.

<u>Black &amp; White</u>	<u>Four Issues</u>	<u>Per Issue</u>
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1/6 Page (4-7/8" x 2-1/4")	\$613	\$175

Printing by offset lithography. Ads should be submitted camera-ready, 133-line screen or minimum of 600 dpi laser output. Artwork which does not conform to mechanical requirements will be subject to surcharge. Ads which include halftones will incur an additional charge of \$25. Refer to the production calendar below for making advertisement submissions.

	<u>Closing Date</u>	<u>Issue Date</u>
Spring	March 4, 1998	April 7, 1998
Summer	June 3, 1998	July 7, 1998
Fall	September 4, 1998	October 6, 1998

Please direct all advertising inquiries to:  
Cindy Bonior  
2175 De La Cruz Blvd. Ste. 1  
Santa Clara, CA 95050  
(408) 496-6187 Fax: (408) 496-6267

## Methyl Bromide

*Continued from page 1*

at this meeting the increased difficulty greatly expanded buffer zones would have on flower growers. The California Strawberry Commission and several other agricultural groups also stated difficulty that would be caused by much larger buffer zones.

DPR at that meeting promised to do further study and come back with recommended buffer zones that hopefully would be easier for growers. On November 26, 1997, the DPR got back to County Agricultural Commissioners with recommendations somewhat less severe than those earlier stated. Adjustments to the suggested permit conditions include the following:

### 1) Slope/Terrain Effect

DPR evaluated the potential impact of off-target movement of methyl bromide from fields with sloping terrain. DPR determined that, for areas with a slope that exceeds 5 percent (5 feet drop in elevation per 100 feet distance) a "cold sink phenomenon" could occur. DPR recommends that a minimum 200 foot buffer zone be applied in these sloping areas.

### 2) Emission Ratio Values for "Very High Barrier Tarp."

Monitoring by DPR utilized a very high barrier tarp. The additional data prompted DPR to recalculate the

emission ratio for these methods, which should be adjusted to 0.19

### 3) Adjustments to Buffer Zone

DPR adjusted buffer zone distances for soil applications to reflect a minimum 100 foot buffer zone for applications 5 acres or less and a minimum 200 foot buffer zone for applications greater than 5 acres.

We are ending up with smaller buffer zone recommendations than those originally made in July by DPR. However, they are somewhat larger than previous buffer zones.

## Cal Poly Hosts IPM Conference

Cal Poly, San Luis Obispo will again host the Environmental Horticulture Integrated Pest Management Conference June 15 and 16 on the campus. The conference is designed to provide growers, pest control advisors, pesticide applicators and landscape and turf maintenance professionals with current information on pest management in the Environmental Horticulture Industry.

The conference is one of very few conferences nationwide which concentrates specifically on our industry. This year's conference features regulatory updates and mini-symposia on whitefly management and problem diagnosis. Participants will have the opportunity to break into small groups and go into the field to view and diagnose real-life problems.

PCAs and applicators will receive

17.5 continuing education credits and credits are also available for Golf Course Superintendents, Arborists and Certified Crop Advisors.

The cost is \$135 before April 1 and \$160 thereafter and includes lunch both days.

For information contact:

*Bob Rice, EHS Dept.  
Cal Poly, San Luis Obispo  
San Luis Obispo, CA 93407  
Phone: 805/756-2830  
Fax: 805/756-2869  
e-mail: rrice@calpoly.edu*

## San Diego Regional Report

*Continued from page 5*

the thrips are more attracted to the flowers than the foliage and the petals do not express local lesions.

Monitoring stations are placed in the field and at the edges of the field. Each station consists of directional sticky traps, i.e. north, south, east and west facing traps, and a plant stand for the petunias. It is important that the petunias be at or slightly above the crop canopy, and that they be placed on a blue surface to increase their attractiveness to the thrips. The plants are placed in self-watering containers so that they don't desiccate during the evaluation period.

The plants are replaced once a week. The plants are examined at the time they are removed from the field, and again a few days later, for the presence of local lesions.

*This research has been generously funded by The American Floral Endowment, UC Integrated Pest Management, and the Carlsbad Agricultural Improvement Fund.*

## California State Floral Association

**Let Us Be The Solutions To Your Problems....**

The California State Floral Association is a non-profit trade organization formed in 1948. It is the only organization representing the entire floral industry on a state level and supported by growers, wholesalers, retailers and allied industries. Drawing its membership and board of directors from these segments of the industry, CSFA can directly affect organizational, member and industry issues from a position of strength and unity when representing its members at state and local levels.

### MEMBER BENEFITS AND SERVICES

- \* Legislative & Regulatory Governmental Representation
- \* CSFA Political Action Committee
- \* "California Florists" Magazine
- \* Personal Assistance
- \* Technical Assistance
- \* Environmental, Health & Safety Services
- \* Statewide Directory
- \* Annual Convention and Top Ten Competition
- \* Legislative Action Day
- \* Education Programs & Seminars
- \* Group Workers Compensation Program
- \* Medical and Dental Insurance Programs
- \* Property and Casualty Insurance
- \* Long Distance Telephone Savings Plan

*Give us a chance to help  
you in your business!*



**California State Floral Association**  
1521 "I" Street  
Sacramento, CA 95814  
Phone: (916) 448-5266  
Fax: (916) 446-1063  
E:Mail: (dbogg@ns.net)

# Upcoming Grower Educational Events

## JANUARY

8-11 FloraWorld '98, Atlanta  
703/242-7000

## FEBRUARY

21-23 SAF Insect and Disease  
Management Conference,  
Del Mar, 800/336-4743

## MARCH

10 California State Floral  
Association Legislative  
Action Day, Sacramento  
916/448-5266

18-22 WF&FSA Annual  
Convention, Bermuda  
703/242-7000

19 CORF Spray Applicator  
Workshop, San Diego  
(Spanish Only) 760/  
723-0807

22-27 CCFC Tentative Trade  
Mission, New York City  
916/852-5166

26-29 CORF Grower Tour,  
Seattle and Vancouver  
760/723-0807

30-31 SAF Congressional  
Action Days, Washing-  
ton, D.C. 703/836-8700

## APRIL

18 Kee Kitayama Research  
Foundation Recognition  
Dinner 408/724-1130

## MAY

14 CORF Spray Applicator  
Workshop, Carpinteria  
(Spanish Only) 760/  
723-0807

17-22 CCFC Tentative Trade  
Mission, Philadelphia  
916/852-5166

27 CORF IPM Diagnostic  
Workshop, Half Moon  
Bay (English & Spanish)

760/723-0807

28 CORF IPM Diagnostic  
Workshop, Watsonville  
(English & Spanish)  
760/723-0807

29 San Diego County  
Flower & Plant Associa-  
tion Golf Tournament  
760/431-2572

## JUNE

4 CORF Tour, Safeway  
Distribution Center &  
Post Harvest Technology,  
Tracy 760/723-0807

15-16 Cal Poly IPM Confer-  
ence 805/756-2279

## JULY

2-6 AIFD National Sympo-  
sium, Boston 410/  
752-3318

7 CORF IPM Diagnostic  
Workshop, San Diego  
(English & Spanish)  
760/723-0807

9 CORF IPM Diagnostic  
Workshop, Ventura  
(English & Spanish)  
760/723-0807

15-18 CAFG&S Fun 'N Sun  
Weekend, Santa Barbara  
408/496-6187

## AUGUST

2-4 California State Floral  
Association Floriculture  
Retreat, Cal Poly, San  
Luis Obispo 916/448-  
5266

## SEPTEMBER

13-18 CCFC Tentative Trade  
Mission, Chicago 916/  
852-5166

23-26 SAF Annual Convention,

Puerto Rico 800/336-  
4743

24 CORF Spray Applicator  
Workshop, Half Moon  
Bay (English Only)  
760/723-0807

## OCTOBER

3-4 California State Floral  
Association Convention  
& Top

10 Competition, So. California  
916/448-5266

8 CAFG&S Golf Tourna-  
ment, location to be  
announced 408/496-  
6187

15 CORF Grower Tour &  
Research Demonstra-  
tions, San Diego 760/  
723-0807

## NOVEMBER

8-13 CCFC Tentative Trade  
Mission, Denver 916/  
852-5166

## DECEMBER

*\*\*This is an attempt to coordi-  
nate the schedules of various  
California organizations. Some  
organizations have not yet  
established the dates of all 1997/  
98 events. This is an edited  
version of a calendar prepared  
by the California Cut Flower  
Commission. To add dates and  
activities, please contact the  
office at 916/852-5166.*



*CORF News* is the quarterly publication of CORF, the California Ornamental Research Federation, a statewide partnership of growers, floriculture associations, allied industry and research/educators whose mission is to identify and meet the research and educational needs of the California floriculture industry.

**Managing Editor:**

**Steve Tjosvold**  
UCCE Monterey & Santa Cruz  
Counties

**Editorial Committee:**

**Dr. Ann King**  
UCCE San Mateo & San Francisco  
Counties

**Julie Newman**  
UCCE Ventura County

**Dr. Karen Robb**  
UCCE San Diego County

**Design & Layout:**

**Janet McCurdy**

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**California  
Ornamental  
Research  
Federation**

2167 Reineman Road  
Fallbrook, CA 92028  
Ph: 760/723-0807  
Fax: 760/723-0148

## *A Word of Thanks . . .*



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## **News and Calendar Submissions**

Submissions from educators, researchers, floriculture associations, growers and allied industry members are welcome in the following areas:

**Research Reports and Observations** - Concise observations, results or discussion of current field research.

**Grower Educational Events** - Upcoming seminars, symposiums, workshops, and other educational events.

**New Publications** - New UC Publications and other significant research-based publications.

**Internet Sites** - Description and addresses of internet sites of particular interest to growers.  
**Campus News**

*Please send submissions to:*  
*Janet McCurdy*  
*c/o Landscape Images*  
*20611 Canada Road*  
*Lake Forest, CA 92630*  
*714/454-0123 x 211*  
*Fax: 714/454-0223*  
*email: mcurdy@compuserve.com*

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