



# CORF News

Floriculture Education from the  
Kee Kitayama Research Foundation

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## Postharvest Around the World

By Dr. Michael S. Reid, Dept. of Environmental Horticulture, UC Davis

In the last thirty years the floricultural industry has become truly a global enterprise. More than half the flowers that U.S. florists sell are grown and transported to this country from every corner of the globe, largely from Central America, but also from countries as far away as Australia and Zimbabwe. It is my opinion that this change in the source of flowers has had adverse effects on the quality, freshness, and life of the flowers, to the detriment of the consumer, and the industry. Our customers regard 'freshness' and vase life as being of primary importance, yet often some or all of the flowers in an arrangement may last only a few days.

A recent Easter bouquet that I purchased exemplified the problem. Carnations, Queen Anne's lace, chrysanthemums, and white calla lilies made an effective and appropriate arrangement for the season. Alas, the callas never opened, and shriveled within two days, the foliage on the mums was already crispy, one of the carnations was broken just below the head, and much of the Queen Anne's lace wilted within hours of being placed in the vase. Was I happy? Emphatically NO! Did I go back to the

*See Postharvest Worldwide- Page 2*

## Do You Use EthylBloc ?

By Julie Newman, Karen Robb, Ann King, and Steve Tjosvold, UCCE

The California floral industry has lost most STS containing products in recent years but has gained a new ant-ethylene product, EthylBloc (1-MCP). We wondered to what extent this new product was being used in California. To find out, we asked growers in five floral production areas if they were using EthylBloc, and for their comments as to why or why not it was being used.

Nathan Smith at Clearwater Nursery noted, "Yes, we do use EthylBloc. It is a very effective tool for postharvest enhancement with certain horticultural crops. When treated with EthylBloc,

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## Thidiazuron: A Postharvest Material to Reduce Leaf Yellowing & Leaf Drop

By Ann I. King, UCCE and Michael S. Reid, Dept. of Environmental Horticulture, UC Davis

In research at UC Davis and with several California growers, we are developing the use of thidiazuron (TDZ) to delay leaf yellowing and leaf drop on both potted plants and cut flowers. This is exciting news for growers. TDZ can be applied as a spray to potted plants prior to boxing and shipping, and it can be used in the bucket solution on cut flowers. It has a great potential in the ornamental market because its effects are long-lasting — it can be sprayed onto potted plants some time before they are "harvested."

Thidiazuron is a compound with strong cytokinin activity, and is used in many tissue culture systems. At very high concentrations, it is used in cotton fields to knock leaves off of the cotton plants, thereby making it easier to harvest the cotton bolls. Our postharvest system on

ornamental plants uses very low concentrations of thidiazuron. TDZ is unrelated to the ethylene response, and reduces leaf yellowing and leaf drop in many crops where STS or MCP are ineffective.

In potted poinsettia (*Euphorbia pulcherrima*) plants, TDZ has a remarkable effect on reducing leaf yellowing and leaf drop by two weeks or more. In another species of *Euphorbia*, thidiazuron not only reduces leaf drop, but it greatly delays drop of the many small colored florets, for which the plant is prized. In potted Asiatic lilies, TDZ also reduces leaf yellowing and leaf drop.

In cut alstroemeria flowers, TDZ markedly reduces leaf yellowing, which

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## Post harvest Worldwide

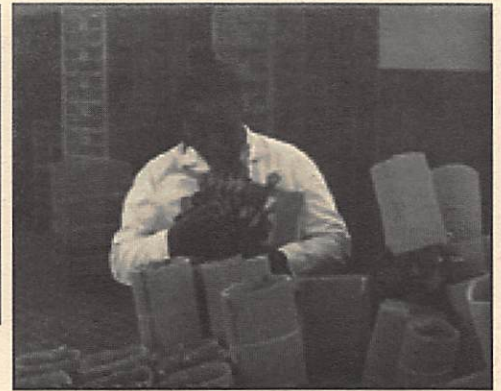
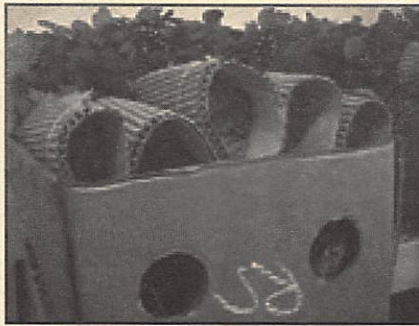
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store and complain? Like a wimp, I did not. So I represent one of those customers that are unsatisfied with the quality of the product that they receive, yet do nothing about it. Such negative experiences certainly affect the consumer's satisfaction with flowers that they purchase, and often result in the loss of return sales.

Although California growers and shippers have suffered from the oversupply of offshore product and the resulting depression in prices, it is my opinion that careful examination of the successes and failures of producers overseas indicate ways that California growers could reinvent our industry.

### Around the world advantages

The dramatic increase in exports of flowers from countries all around the world during the last two decades is the result of significant advantages that producers in those countries have. In most countries, labor, which is a



**Roses packed in Nairobi (left) and Kenyan worker packing roses (right). Photos by Michael Reid.**

significant input cost for U.S. producers is quite inexpensive. In Kenya, for example, skilled packing-house staff are paid \$1.25 per day, and field workers as little as \$1 per day. Other countries capitalize on their climatic or regional advantages. Ecuador, situated right on the equator, has a constant day length, and a steady climate. Because of the range of elevations in the country, producers

can choose to locate their operation in the ideal climate for the crops that they intend to produce. Zimbabwe, Australia, and New Zealand have the 'Southern Hemisphere' advantage — their peak production is during the high-priced months of the Northern Hemisphere winter.

One further advantage that some overseas producers have is the

*See Postharvest- Page 3*

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## Postharvest Worldwide

*Continued from page 2*

opportunity to produce and harvest their native flora. Australian wildflowers, both fresh and dried, have garnered an important share of the world's floral market, while South Africa still leads the world in the production of their native Proteas and other Proteaceous plants, especially for cut foliage.

### Around the world challenges

Despite the significant advantages that overseas producers have in comparison to U.S. growers, they also labor under significant disadvantages. Their inexpensive labor is often poorly skilled, and the low wages also result in low motivation. Their particular disadvantage, however, is their distance from the markets of Western Europe and North America. Land-locked countries such as Kenya are obliged to send flowers by air.

Although the common assumption is that air transport is rapid and gentle, nothing could be further from the truth. In many exporting countries, lack of in-country infrastructure means that flowers are often not precooled, and frequently transported to the airport over slow, rough roads in unrefrigerated vehicles. Customs and quarantine inspections result in flowers being held at the airport, usually in non-refrigerated conditions, sometimes for many hours. And travel by aircraft is no joy for the flowers, either. The lack of temperature control and the extremely dry air in aircraft result in substantial water loss — a stress that may result in reduced vase life, or even failure to rehydrate.

The cost of air freight also imposes challenges for overseas producers. Since flowers are relatively light, they usually are charged on a volume basis, resulting in a natural tendency to try to pack as many flowers into a box as possible. The resulting dense packs make precooling almost impossible, reduce the protective benefits of the box and packaging, and often result in significant mechanical damage to petals, leaves, and even stems.

*See Postharvest Worldwide- Page 10*

## EthylBloc

*Continued from page 1*

postharvest enhancement & longevity has varied from dramatic to nominal, depending on the crop. We believe in the product and feel that it has made a significant contribution to the performance of our product(s) in the retail floral trade."

Butch Yamashita, recently of Robert Hall Inc. in Encinitas and currently with Corey Nursery in Nipomo, states that supermarket distributors are requiring the use of EthylBloc on Kalanchoe. "These customers are very pleased with the results of EthylBloc use on Kalanchoe. However, we have a different situation when we ship to interiorscapers, where we ship tighter product and the Kalanchoe are not placed near ethylene-producing vegetables." Butch concludes that this product greatly improves the postharvest life of Kalanchoe in supermarkets, but suggests there is considerable room for improvement in the methods of application of EthylBloc.

Barry Brand of Brand Flowers, in Carpinteria, says that in tests conducted at their nursery comparing EthylBloc with STS on snapdragons and delphiniums, they felt STS was the superior product. "We are working with our Chrysal product representatives and are pushing to get their STS product back on the market." However, even if it becomes available again he reiterates that their supermarket distributor is forcing them to use EthylBloc.

Alex Van Wingerden of Westland Floral says that EthylBloc works most effectively in warmer temperatures. As a treatment in coolers it is best applied overnight. "This hasn't been a problem for us, but it is for growers who are looking for faster treatments for application in the cooler."

Several growers at potted plant nurseries in the Half Moon Bay area noted that the logistics of applying EthylBloc as a gas are just too difficult to use it routinely. Their main concern was lack of sufficient sealed space and time during heavy shipping periods. Only on very sensitive species do they routinely use it, or when a buyer requires it. The same growers were interested in EthylBloc as a wet

spray. If a wet spray were available and labeled for pre-harvest greenhouse use, the growers would be willing to try it on plants still in the greenhouse before boxing them for shipping.

Hawaiian Orchids Direct, in Salinas, produces and ships various potted orchids, including Dendrobium, Phalaenopsis, Oncidium, Cymbidium and others. Don Eberly states that they tested EthylBloc for around 4 months but did not see any difference in postharvest quality of the plants. Says owner Don Eberly, "We are doing things differently now. When we thought we had an ethylene problem we were moving product with common carriers such as UPS and Federal Express. Now we are shipping to local markets in our own trucks without packaging material". Apparently ethylene may have been an important deleterious factor when plants were confined in boxes with relatively long shipping times, but not any more. Don concludes, "Our customers are very happy with our product."

We suggest that in some cases, growers do not have enough education on how to use EthylBloc effectively. In other cases, growers are using it properly and are very satisfied. In yet other cases, growers would like to use the material, but cannot manage the logistics of using it.

Dr. Michael Reid at UC Davis summarizes: The comments of the growers are in agreement with our findings. EthylBloc is very effective in preventing the effects of ethylene in sensitive plants and cut flowers. STS is also an excellent product, and for some crops has the advantage that it extends the protection for a longer time and to newly opening buds. We are continuing to work on diversifying the EthylBloc treatment protocols available to growers, including the use of liquid spray formulations, and the effects of different treatment times, concentrations, and temperatures.



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## Thidiazuron

*Continued from page 1*

greatly increases the longevity of cut alstroemerias. We are currently testing a range of cut flowers to see which respond to TDZ.

There can be deleterious side effects of TDZ on ornamentals. High concentrations can cause elongation of side shoots on cut snapdragon stems, and cause branch initiation in mini-roses. It is important to establish proper concentrations for ornamental use.

We are continuing research to determine the optimum concentrations of TDZ, which species of ornamentals respond to TDZ, and its mode of action. Current plans are underway to develop TDZ as a commercial postharvest treatment for the ornamental market.



## IPM Update - Postharvest IPM

By the time you harvest a crop you should have already taken care of most pests in the field. However, there are other pest management considerations after the crop is harvested. Low storage temperatures near 32° restrict development of most plant diseases and insects. Few fungal pathogens are able to cause diseases because they are rarely pathogenic at low temperature. Recall that in order for a disease to occur, (1) the pathogen must be present, (2) a suitable host must be present, and (3) the environmental conditions must be right for the pathogen to infect the plant. That is not to say that plant diseases won't occur, but they usually show up after the temperatures rise, such as when they are taken out of the cooler or if the shipping temperatures are too warm. Even a couple of degrees can make a difference. Botrytis, for example, the most commonly encountered postharvest disease can even grow

(albeit slowly) at temperatures near freezing in the humid environment of the flower head. Diseases can be minimized in storage by proper sanitation, temperature control, and minimizing condensation.

With dried flowers you can have some disease or insect problems that are very different from those found in fresh flowers. Weevils in particular are noted for infesting stored products. There are a few ways to reduce insect infestation. One way is to place the plants in cold storage for a day or more. One needs to be careful that the plants are able to tolerate the cold temperatures though. Another method is to introduce CO<sub>2</sub> into a semi-sealed container holding the plants.



*Cheryl Wilen, Area IPM Advisor  
Ornamentals, UC Statewide IPM Project*

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## Regional Report

### *San Mateo & San Francisco Counties*

#### Field Observations

##### Downy Mildew

Local growers have been reporting downy mildew on several different flower and vegetable crops.

Conditions along the coast in San Mateo County are ideal for downy mildew — cool, wet, and foggy!

The usual place to look for downy mildew is on the undersides of the leaves, where it often appears as a white/gray/purple fuzzy sporulation (similar to botrytis). But symptoms can initially cause confusion if you are not familiar with downy mildew — it can make leaves look chlorotic, distorted, stunted, or can cause necrotic-looking dark or yellow spots on the top of the leaves. If in doubt, always use a hand lens to examine for the fuzzy sporulation on the *undersides* of leaves. Early diagnosis is essential, so regular scouting for downy mildew is a must.

Try to avoid excess moisture on leaves. With downy mildew, irrigation practices should be used to avoid excessive wetting of leaves (such as drip irrigation, or timing the irrigation so that leaves dry quickly). In a greenhouse, humidity should be reduced as much as possible (with heating and venting) when downy mildew outbreaks are occurring.

Chemical control will probably be necessary, but it depends on the crop and the stage of the disease. In this limited space, I cannot address all of the current chemical controls. For more information on downy mildew and chemical control recommendation, check out recent articles in *GrowerTalks* (Feb. 2002 and Aug. 2001), *GM Pro* (Apr. 2001), and [www.ucipm.ucdavis.edu](http://www.ucipm.ucdavis.edu).

#### Alternatives to Methyl Bromide Field Day in San Mateo Co. & John Muller Named Farmer of the Year



##### Alternatives to Methyl Bromide Field Day in San Mateo County

**Dr. Clyde Elmore** at UC Davis has a statewide research

project to examine alternatives to methyl bromide for field flower growers. Cheryl Wilen introduced the project in the last issue of *CORF News*, but here is a San Mateo County update. With the projected loss of methyl bromide in 2005, growers need alternatives to clean fields between plantings. One of Dr. Elmore's field research sites is at Año Nuevo Flower Growers in Pescadero (owned by Don Garibaldi and family).

Methyl bromide is useful because it controls many pathogens (which cause diseases), nematodes, insects, and weeds (although it is not too effective on clovers, field bindweed, or cheeseweed). In selecting alternatives to methyl bromide, it is important to find a material, or a combination of materials, that will control diseases, nematodes, insects, and weeds.

While Dr. Elmore's interest is primarily weeds, the study is also looking at the new materials on nematodes and pathogens in the field. Also involved in the study are John Roncoroni (from Dr. Elmore's lab), Dr. Ann Chase (a plant pathologist at Chase Research Gardens, also representing the California Cut Flower Commission), Linda Bolkan and Dr. Jim MacDonald (plant pathologists at UC Davis), and Dr. Howard Ferris (a nematologist at UC Davis). Others are involved too, including several farm advisors.

In the three trial sites in California, some of the materials being examined are 1,3-D (Telone) + Chloropicrin, both with and without metam sodium (Vapam) or dazomet (Basamid). Other materials being tested are iodomethane (not yet registered), propargyl bromide, and sodium azide (an older material). Different application methods are also being tried,

including the use of different films to tarp the treated areas, and drip application of materials.

All of this was presented at a Field Day in March at Año Nuevo Flower Growers. Many of the researchers gave presentations on the project, along with **Steve Tjosvold**, Farm Advisor from Santa Cruz/Monterey Counties, who discussed the possibility of steaming soils in the field as a methyl bromide alternative. While steaming has been used for a long time in greenhouse beds and on container media, it has generally been considered too slow and costly to use in a large field. Steve's conclusion is that steaming may have some use in the field in limited areas (like the narrow seeding/planting strip), or in high-value crops.

**John Muller** of Daylight Nursery in Half Moon Bay also gave a presentation of his new Gopher Buster device. The gopher buster is a propane-powered device that ignites a volume of propane in the gopher tunnel. The blast is forceful enough that it kills the gopher quickly and humanely. Once Muller gets through the regulatory aspects of using the equipment, he sees using it for farmers and in home landscapes.

Watch for another **Alternatives to Methyl Bromide Field Day** in southern California in mid-May, sponsored by CORF.

##### John Muller—Farmer of the Year

Congratulations to **John Muller** of Daylight Nursery, who was named 'Farmer of the Year' at San Mateo County's annual Farm Day Lunch last month. John is a third-generation local farmer, who in addition to running Daylight Nursery with his wife Eda, and in-laws Al & Eda Adrevino, has been involved in Farm Bureau, and the Bay Area Water Quality Control Board.

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## Regional Report

### *Santa Cruz & Monterey Counties*

#### Effect of Reduced Risk and Other Biorational Fungicides on Control of Powdery Mildew on Greenhouse Roses



I completed an experiment in 2001 that evaluated various commercial and experimental "reduced-risk" fungicides for control of

powdery mildew on greenhouse potted roses. This article is a summary of that experiment. If you wish a complete report including the data tables, please contact me.

#### Experimental methods:

Treatments consisted of representative experimental and commercial fungicidal groups applied at rates according to the manufacturers' recommendations. Plants were treated soon after the first sign of mildew. Treatment dates were; August 31, September 7, 14, 21, and 28. Dates were timed according to the treatment protocol (sometimes weekly, sometimes every other week). Approximately six days after each treatment date, powdery mildew incidence and plant vigor were rated.

#### Treatments listed by chemical classes:

Rate in parentheses is for formulated product in 100 gallons

**Sterol inhibitors:** EXP 80318C SC (Aventis) (1 fl oz every week, or 2 fl oz every week)

**Horticultural oils and waxes:** E-RASE (IJO Products) (32 fl oz every week, and 64 fl oz every 2 weeks)

**Strobilurins:** Compass (Bayer) (1 fl oz every week and 2 fl oz every 2 weeks),

**Heritage** (Syngenta) (1 oz every week and 2 oz every 2 weeks, **BAS 500** (BASF) (8 oz every week and 16 oz every 2 weeks) and **Cygnus** (BASF) (1.6 oz every week, and 3.2 oz every 2 weeks).

**Activated Resistance Compounds:** Elexa (Safe Science) (12.8 fl oz every week), **Milsana** (KHH BioSci. Inc.) (64 fl oz every week, and 128 fl oz every 2 weeks)

**Biocontrol Agents:** MT 2020 (Mannatech Experimental) (64 fl oz every week, and 128 fl oz every 2 weeks), **Sporodex** (Plant Products Co. Ltd.) (64 fl oz every week)

**Mineral salts:** Phyton 27 (Source Tech.

Biologicals, Inc.) (13 fl oz every week)

**Other chemistry:** Decree WDG (SePro) (24 oz every 7 days) and Decree SC (24 fl oz every 7 days)

#### Fungicide Efficacy

1. Most fungicide treatments controlled powdery mildew with the relatively light mildew pressure existing through most of this experiment.
2. EXP 80318C was much more effective at the 2 oz versus the 1 oz rate.
3. Both formulations of Decree are active against powdery mildew but the commercial WDG formulation was the most active.
4. Phyton 27 is active against powdery mildew
5. E-RASE is moderately active and best used at the 32 fl oz rate on a weekly basis.
6. The strobilurin fungicides, Compass, Cygnus, and BAS 500 showed activity for 2 weeks when used at their respective higher rates. Heritage did not have a similar longer activity when used at the high rate.
7. The biocontrol agent MT 2020 applied at a weekly spray interval provided moderate control but not when it was applied at a 14-day interval at the higher rate. The biocontrol agent Sporodex did not show significant control.

#### Rose Plant Vigor

The treatments caused no serious phytotoxicity in this experiment. Only the Decree 500 SC treatment showed a significantly lower vigor rating, but the lower rating was attributable to lower general vigor and color, not necrosis or malformation.

Not all products in this experiment are registered by the EPA or the California Department of Pesticide Regulation. For the latest registration status in California go to <http://www.cdpr.ca.gov/dprdatabase.htm>.

*This research was funded by the Kee Kitayama Research Foundation and Hill Foundation.*

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## Field Observations

### Sudden Oak Death (SOD) Quarantines Impact Nurseries

A new federal SOD quarantine was announced in the Federal Register by APHIS on Valentine's Day. This was no Valentine's love letter. APHIS is now the latest regulatory agency to quarantine hosts of Sudden Oak Death and associated nursery and commercial products. This quarantine may prove more problematic than other State quarantines already in place as it regulates *soil* from any of the 10 infested counties in California regardless of whether it is associated with a host of SOD. The California quarantine only regulates the 15 SOD hosts as nursery stock and associated wood products. Nurseries growing these hosts in the infested counties will need to deal with federal inspection, sampling and shipping requirements for *interstate* transport. *Any* nursery in the infested counties may have to show that they do not use contaminated soil. For many months nurseries have already been dealing with California and Oregon quarantines that affected *intrastate* transport. Canada also has had a quarantine similar to the federal quarantine. Canada also regulates soil from quarantined counties. Although our local nurseries generally do not have many or large shipments to Canada, for some the Canadian quarantine has created a big headache.

Regulation goes beyond just nursery stock and soil. The federal, state, and Canadian quarantines regulate host material when it is firewood, wood chips, wood mulch, and foliage products such as wreaths, garlands and cut foliage. The regulations, their interpretation, and their implementation are changing almost daily. For more information on the quarantines you can read the official quarantine statements.

#### Websites for regulatory agencies

APHIS <http://www.aphis.usda.gov/ppd/rad/webrepor.html>

Oregon: [http://www.oda.state.or.us/plant/ppd/sod/EQ\\_SOD.htm](http://www.oda.state.or.us/plant/ppd/sod/EQ_SOD.htm)

California: <http://pi.cdffa.ca.gov/pqm/manual/pdf/455.pdf>

Canada: <http://www.inspection.gc.ca/english/plaveg/protect/dir/d-01-01e.pdf>

## Regional Report

### Ventura & Santa Barbara Counties

#### Avoid Public Complaints by Creating a Positive Image



Spring is here; time to spruce up your property's appearance—especially important if you are located near

schools and residential neighborhoods. Maintain your greenhouse and other protective structures so that they are not shabby or dilapidated. Don't forget that the appearance of your property grounds is also important. This includes eliminating weeds; making sure all refuse, soil, compost piles, and plant containers are covered and out of sight; and ensuring that on-site parking for employees, trucks and visitors is adequate to prevent vehicle parking on the street.

Glare from greenhouse covering materials and night-lights are frequent public complaints. Sunlight that reflects off greenhouses and produces glare can be hazardous to road travelers and visually displeasing to neighbors. Minimize glare by using property setbacks and landscape screening. Check with your county or city planning department, and follow local codes and ordinances governing these requirements carefully. If you are lighting crops at night, invest in a mechanized blackout screen system within growing areas to prevent interior night lighting from being visible outside your greenhouse. It is expensive to retrofit but it can be less costly in the long run than complaints from neighbors.

There are other things you can do to create a positive community image. For example, consider landscape screening and esthetic improvements to reduce industrial effects, maintain a lower visibility in the critical public eye, and reduce sound level. Expansive parking lots, truck loading bays and wide driveway entrances necessary to accommodate truck-turning radii contribute to an industrial image. This leads to an increasing public sentiment that greenhouses are little more than

“plant factories” that belong in industrial sites, not neighborhoods.

In addition, greenhouses located near residential areas produce many unwelcome sounds. Sources include fans, heaters, radios, paging systems, exterior loud speakers, boilers, and generators. Truck noises, especially from idling refrigerator trucks, and loading noises in shipping and receiving operations can be significant. While these may seem like minor annoyances they can develop into strong emotional resentment from the surrounding community.

Greenhouses, packing sheds and warehouses that are visible at property lines need to be screened. Use landscaping buffers to visually obscure them and to reduce noise levels. Solid wall fencing may be prohibited by local ordinances; if you use chain-link security fencing, cover it with climbing vines. Use of dense vegetation such as tall hedges may be somewhat imposing and unnatural in appearance. Solid tall hedges and screens are usually not recommended because they obscure background views, and can create a tunnel effect when installed on both sides of a roadway. Use a variety of landscape material planted in layers of staggered heights instead. Accent entry drives and office areas with color and attractive landscaping. This will divert the eye from the less esthetic areas.

Don't give anti-agriculture folks reasons for contacting officials about the appearance of your operation. Clean up your property, reduce glare and night lights, and use judicious landscaping. This will reduce neighbor conflicts that can lead to increased governmental regulation. The end result will improve sustainability of our industry.

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### Field Observations

Although we haven't received much rain this year, in recent storms I have observed some storm water runoff from residential and commercial building structures, including greenhouses. It seems likely that storm water runoff is another area where regulations will be tightening in the future, and agricultural operations may be losing their exempt status statewide. Because growers that we surveyed have different opinions as to what storm water regulations are currently in place, depending on whom they contacted for information, I asked *Christie Rea*, UCCE Ventura County Water Coordinator, to investigate.

Christie found that as part of the US EPA Storm Water Quality Program, Regional Water Quality Control Boards issued orders to counties within their region requiring them to proceed through a Phased Storm Water Quality Permit program. In Phase I, each jurisdiction in the region (cities, counties, municipalities) has to identify storm water runoff sources, inventory them and determine the process and procedures for inspection of these runoff sources. In Phase II, each jurisdiction must integrate their plans with other jurisdictions within the watershed, so that each watershed has consistent permitting regulations. Counties are in the process of developing different storm water regulations. San Diego County, for example, has a Storm Water Discharge Permit in effect that regulates industry – nurseries and greenhouses fall under this. This permit requires catching the first 0.6 inches in a storm event. In Ventura County, anyone discharging storm water into flood control channels must apply for a Storm Water Discharge Permit. The permit requires that no storm water runoff can be discharged over what would be produced in a 10-year storm event. In Santa Barbara County, storm water permit regulations will not be developed and implemented until March 2003. For further information, contact *Christie Rea* at 805/645-1463, [ceera@ucdavis.edu](mailto:ceera@ucdavis.edu).



## Regional Report

### San Diego County

#### State Water Board Seeks Statewide Input on Creation of Controls for Agricultural Runoff



To address a legislative mandate requiring that state water authorities revisit all regulatory waivers by the

end of the year, the State Water Resources Control Board is undertaking a nine-month plan to involve growers, environmentalists and all interested parties in the development of measures to control the effects of agricultural runoff. Agricultural drainage has been granted waivers from government permitting requirements for 20 years. The State Water Board, and its nine regional water boards, will coordinate public workshops in key agricultural areas throughout the state within the next few months. These open forums will help state regulators, in cooperation with growers, to reduce the escape of pesticides, fertilizers and other agricultural byproducts to nearby rivers, streams and groundwater sources. This new activity will affect more than nine million acres of farmland.

"We look upon this as an inclusive and deliberative process that will help resolve a growing environmental concern in our agricultural community," said State Water Board Chairman Arthur G. Baggett Jr. "Those in the agricultural community and in the environmental community have innovative ideas that will help state regulators better manage this problem, and ultimately, protect our state waters."

The California Water Code allows Regional Water Quality Control Boards to issue waivers, instead of permits, to dischargers when the boards find it is in the public interest to do so. Over the years all nine Regional Boards have adopted waivers for certain types of

discharges. The return of agricultural irrigation water to surface streams and rivers is among the approximately 40 types of activities treated in this way. In 1999, Senate Bill 390 (Alpert) amended the Water Code to rescind all waivers by the end of this year except those that the regional boards decided to readopt under new, stricter guidelines.

"The nine regional boards may take a variety of approaches," Baggett said. "Some waivers will be readopted, others will be replaced by specific or general orders, and some may be regulated in other ways."

The State Water Board will be actively involved in the process. During the workshops, State Board members will listen to all interested parties, whether from the agricultural, environmental, or business communities, as well as concerned members of the public about how best to embark on the process. "A well designed monitoring program is clearly the first step," Baggett said. "What form that program takes as well as what follows from that program are yet to be determined and the input of all parties will be vital to those decisions." In San Diego County, we are planning workshops in a number of watersheds to address this important issue.

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University of California Cooperative  
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Phone: (858) 694-2857  
Fax: (858) 694-2849  
e-mail: klobb@ucdavis.edu*

## Field Observations

### Redgum Lerp Psyllid Biocontrol Update

Several releases of redgum lerp psyllid parasites have been made in San Diego County. The three original release sites have received multiple releases, and three more release sites have been added. We have continued monitoring populations of psyllids and parasites throughout the winter. As expected, both psyllid and parasite levels were low during the cold winter months. However, parasitism was evident throughout the winter, and we continue to see parasitism occurring. Many of the redgum trees in San Diego County are pushing out new foliage.

At the original release site, all new foliage is free of lerp. However, there are many redgums in the county, which appear to have a tenuous hold on survival. We did not anticipate the severe impact of redgum lerp psyllid infestation on redgums. Certainly redgums in Australia have survived infestations for years. However, many of the California redgums have succumbed in a relatively short period of time. Typically we would expect to see a rise in psyllid populations as the spring temperatures increase with a subsequent rise in parasite levels. It is unclear how many more of these trees will die before the psyllids are brought under widespread biological control.

What can be done to protect the surviving redgums while the biological control program continues to become established? This is uncharted territory. A best guess would be to ensure that the trees are maintained as stress-free as possible and adequately watered, keeping in mind the state of the trees. A tree with little foliage cannot handle as much water as one with plenty of foliage. Fertilization is unlikely to help the trees and may actually benefit the psyllids.

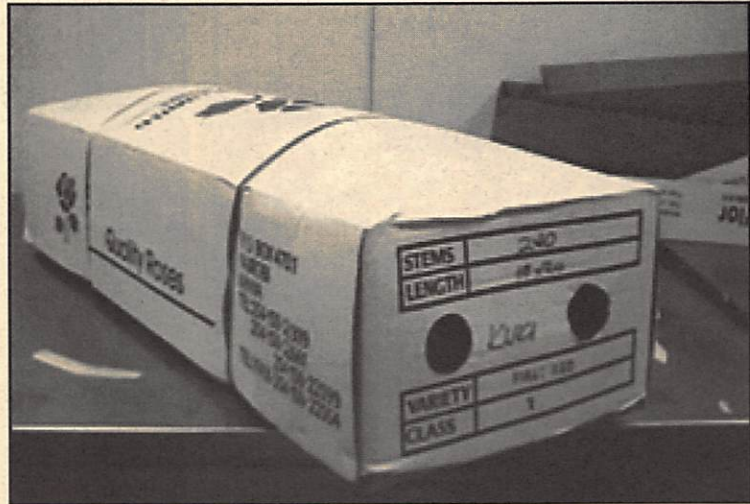
## Postharvest Worldwide

*Continued from page 3*

### California's advantages

This brief description of the postharvest challenges to growers in other countries exporting to our market indicates clear opportunities for California growers. If we utilize the information and infrastructure that we have available, we could deliver truly 'fresh' flowers to consumers who are jaded by receiving flowers that have little or no remaining vase life.

To do this, we need, as an industry, to be committed to the principles of postharvest care of our flowers, the three Cs — 'Cooling, Cleanliness, and Care'. We should ship only fresh flowers (within 24 hours of harvest), we should pack them to minimize transportation damage and to ensure ease of precooling, and we should cool them to 32 F and maintain that temperature until they arrive at their destination. These simple strategies are presently not available to the offshore producers who are competing in our market, and we should seize the opportunity to



**Tightly packed box of flowers ready for export from Kenya. Photo by Michael Reid.**

differentiate California flowers in the minds of our customers across the U.S. Once we have a postharvest system that routinely delivers flowers that have longer vase life, we can confidently label our flowers 'California Fresh,' and can expect the consumers to purchase them in preference to generic flowers with uncertain postharvest lives. ❖

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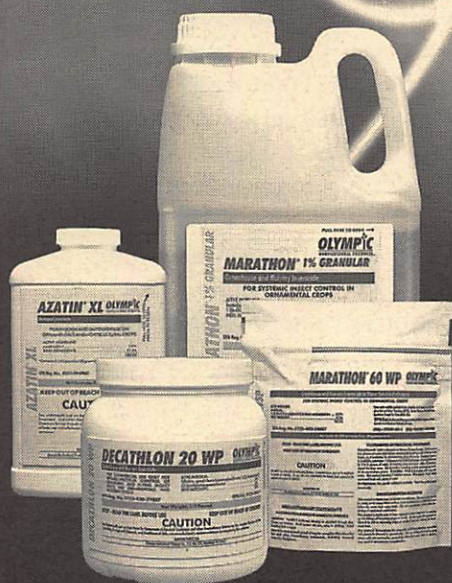
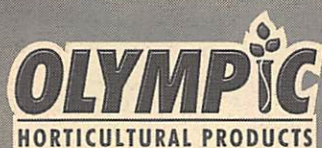
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## Internet Sites - Postharvest Handling of Floriculture Crops

By Dr. Donald Merhaut, Extension Specialist, Nursery and Floriculture, UC Riverside

Postharvest quality is probably the primary factor that dictates whether a certain flower or foliage crop will be considered as a product in the cut flower industry. Flower and foliage quality must be maintained throughout processing, shipping, retail display, and customer's handling. Every aspect of plant production will influence postharvest quality, from selection of the proper cultivars, to production practices being implemented, to the method of harvest and storage. We have listed five primary sites that address postharvest quality of plant materials. Please remember that recommendations are often based on particular growing regions, where cultural practices and climatic conditions will differ. Always consider your particular site before implementing new production and postharvest practices, taking into consideration the specific growing and processing conditions of your facility. If you decide to venture into the web on your own, be aware of the 'snake oils' that may be advertised. If you do find some postharvest aides, be sure that they have been investigated thoroughly. Don't be misled by the saying 'university tested.' Many research programs do test various chemicals and growing techniques, but that does not mean that the products have been 'university approved.'

**Local Sites:** [www.corf.org](http://www.corf.org) - CORF website, <http://danr.ucop.edu> - This site provides information on the current programs and extension personnel available to address specific questions.

### Postharvest Sites:

[http://www.ces.ncsu.edu/depts/hort/floriculture/crop/crop\\_postharvest.htm](http://www.ces.ncsu.edu/depts/hort/floriculture/crop/crop_postharvest.htm) - This site is presented by North Carolina State University. It contains a list of downloadable leaflets on many aspects of flower and bedding plant production and postharvest techniques. Some of the leaflets are crop-specific, while others are general crop production guidelines.

<http://www.actahort.org/books/167> - This site is presented by the International Society for Horticultural Science. There are several articles available on this web page that address production and postharvest aspects of floriculture crops.

<http://postharvest.ucdavis.edu/pubs/phn92.html> - This site is hosted by the University of California. The author of this web page is Dr. Michael Reid, who is also the author of the feature article. Several articles are presented on the postharvest techniques of crops, as well as information on some specific flower crops. There are also some links to other related sites.

<http://ohioline.ag.ohio-state.edu/~flori> - A general site available through Ohio State University. Information is available on postharvest techniques and cultural programs related to floriculture and has links to other university agricultural programs.

<http://www.nvo.com/hortfyi/door/> - This site provides links to universities for the information needed on any aspect of floriculture production. Links are also provided for many agriculturally related industries including chemical companies, equipment manufacturers and distributors.

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# Campus News & Research Updates

Submitted by Julie Newman, UCCE Farm Advisor, Ventura and Santa Barbara Cos.

## Campus News

**CAL POLY SAN LUIS OBISPO.** Two departments within the College of Agriculture – Crop Science and Environmental Horticultural Science – have joined forces as of January 1, 2002, as the Horticulture and Crop Science Department (HCS). The new department not only combines resources, such as an endowed professorship in biotechnology, but also increases students' opportunities for an in-depth, expanded perspective of the production agriculture industry.

The new HCS Department takes the individual strengths of each discipline, including faculty, production facilities, student internships, plus winning student clubs and teams, and together provides four distinct majors: Crop Science, Environmental Horticultural Science, Fruit Science and Plant Protection Science. A fifth major, Wine and Viticulture, is currently being developed. HCS Department Chair **Phil Doub**, who teaches agribusiness, sees this merger as a tremendous opportunity for faculty to shape the new department into one that meets the future needs of students and the agricultural industry. Doub has been instrumental in the development of the Wine and Viticulture major, and served as Food Science & Nutrition Chair. "By meeting the needs of current and new students with an expanded curriculum and more opportunities for electives that cross traditional boundaries, our graduates become employable in more facets of agriculture," said Doub. "It also provides for increased student enrollment while still maintaining our close faculty-to-student ratio and traditional 'Learn by Doing' educational philosophy."

Interim Dean for the College of Agriculture, **David Wehner**, said "I believe it is vital for the faculty to continue their teaching excellence by facilitating a close partnership with their students, and continuing the hands-on student enterprise approach, key to Cal Poly's success throughout the years."

For more information, please feel free to contact the Horticulture & Crop Science

Department at (805) 756-2279, Building 11, Room 244, Cal Poly, San Luis Obispo, CA 93407.

## UC DAVIS DEPT. OF ENVIRONMENTAL HORTICULTURE

**Harry Kohl Memorial Scholarship Seeks Donations.** The Harry Kohl Memorial Scholarship Fund was established in July 1999 by the Department of Environmental Horticulture to honor Harry C. Kohl, Jr. who died September 23, 1996. The Department needs \$10,000 to start providing small scholarships to deserving graduate students, and are a mere \$3,000 away from their first goal. If you can help, please send check donations made out to the UC Davis Foundation (with a note as to the purpose of the donation) to Sandra Fielden, Department of Environmental Horticulture, University of California, Davis, CA 95616-8587.

Harry Kohl, a longtime Davis resident and UC Davis emeritus professor, is well remembered for his early work in the 1950's responding to the needs of California's fledgling floriculture industry. After establishing his career at UCLA, he moved his family to Davis where he was instrumental in making a new department, now known as Environmental Horticulture, a success. He served as chair from 1966-1973. During those years, he assured first-class greenhouses for the Department and set goals for the future direction. After "retiring" in 1986, Harry did ongoing research in large-flowered cyclamen hybrids and evaluating the potential market for his short crop seed-propagated Easter lilies. Harry had numerous accomplishments and is fondly remembered for his pleasure in mentoring graduate students, his sense of humor and his friendship.

**Picnic Day.** On Saturday, April 20, 2002 folks from all over California came for this annual Open House to see what's going on in every unit of the UC Davis campus. According to the Picnic Day Board of Directors, this is the largest student run event in the United States. From the pancake breakfast and parade to the battle of the bands, the day is

intended to highlight the richness of campus life, to celebrate the achievements of UCD students, staff and faculty and to provide a day of education, information and entertainment for all who attend. There were be more than 150 events throughout the Davis campus and expected attendance was estimated at over 50,000.

EH faculty, staff and students planed a full day of activities to showcase the department's achievements and extend practical horticultural information to the general public. Because the department's building complex is on the outskirts of campus, a small greenhouse in a more central location has been used in recent years. Decorated with plants and flowers and staffed by horticulturists eager to answer questions, this location attracts people who are then directed to the department for tours of the greenhouses and grounds. In addition to tours there were be plant giveaways and a series of mini seminars, as well as tours. Hundreds of six packs of bedding plants transplanted from plugs donated by Goldsmith Seeds were in used for Picnic Day. These plants and information on their care were given away to those visiting the department. A series of mini seminars on topics of interest to home gardeners and horticulture enthusiasts were run on Picnic Day from 10:00 AM to 3:30 PM in the department's classroom. Each mini seminar lasted about 20 minutes and feature faculty and students. Included was a presentation on commercial rose production by **Heiner Lieth**, Department Chair.

**Hydroponic Vegetable Class.** **Ron Lane** will be teaching 'Hydroponic Vegetable Production,' a University Extension course scheduled for May 24, 2002. This is an intensive one-day introduction to the commercial production of vegetables using various water culture methods. Find out more information at University Extension's web site (<http://extension.ucdavis.edu/>). Ron is approaching his tenth year of service with the University. His efficient management of the department's greenhouses is a model for the campus.

See Campus News- Page 15

## Campus News

*Continued from page 14*

**On the Move.** Two students working with Dr. Heiner Lieth, *Soo Hyung Kim* and *Loren Oki*, completed their Ph.D. theses in recent months. Dr. Kim is now at the USDA ARS facility in Beltsville, Maryland. *Alison Berry*, *Michael Barbour* and *Truman Young* are set to move into their new offices and labs in the nearly completed Plant and Environmental Sciences Building (better known as EH's 'North Facility') in May and June. They are looking forward to collaborating with their new neighbors in the department of Agronomy and Range Science and the department of Land, Air and Water Resources.

### UC DAVIS DEPT. OF ENTOMOLOGY

Attention California ornamental growers with mealybug problems. *Heather Laflin*, a graduate student working with *Michael Parrella*, is creating an IPM control program for mealybugs in California nurseries on ornamental crops for her master's project. She will be testing the efficacy of reduced risk pesticides against mealybugs and then testing these pesticides for their compatibility with 3 or 4 mealybug natural enemies. In order to do this work it would be helpful to know which mealybug species are most problematic in California nurseries. She is hoping growers currently experiencing mealybug problems can send her a sample of insects so she can determine the scope of the problem within the state.

Leaf samples containing live mealybugs can be sent in vials or containers. Mealybugs can also be sent in vials containing a 70% ethyl alcohol if preferred. If you have questions, or need supplies to send samples you can e-mail Heather at [hmlaflin@ucdavis.edu](mailto:hmlaflin@ucdavis.edu) or call (530) 752-4784.

Please send mealybugs to: UC Davis, Department of Entomology, Attn: Heather Laflin, One Shields Avenue, Davis, CA 95616

## Research Updates

### Alternative Cultural Practices for Bare-root Roses

*J. Ole Becker, Dept. of Nematology  
UC Riverside, Riverside, CA 92521  
Ph.: (909)787-2185  
Fax: (909)787-3719  
E-mail: ole.becker@ucr.edu*

Approximately 60% of U.S. bare-root rose production is situated around Wasco, CA. In the conventional production system, roses are grown in furrows to facilitate cutting establishment and subsequent irrigation. In several field experiments, we investigated growing roses on raised beds or flat ground and irrigating with buried low-volume irrigation tubing. Establishment of rose cuttings was difficult without above-ground application of water to keep the cuttings moist and seal the soil surface; consequently, overhead irrigation seems necessary. After establishment, underground drip irrigation is likely to provide several advantages over furrow irrigation such as water conservation, minimizing dissemination of plant pests and pathogens along a furrow, and reducing plant susceptibility to certain diseases by lowering the microclimate humidity. Drip tubing placed at a 12-inch depth resulted in the largest rose biomass production compared to roses grown with tubing depths of 4, 8, or 16 inches. For roses planted on flat ground, in-row spacing of 8 inches was superior to 6 inches in terms of greater root dry weight and caliper. However, potential benefit of an increase in plant size needs to be evaluated with regard to concomitant reduction of plant number per acre.

*Karlik, J.F., U.K. Schuch, and J.O. Becker. 2001. Bare-root rose production with underground drip irrigation. Acta Horticulturae 547:221-226*

### Biological Control of Leafminer

*Michael Parrella, Dept. of Entomology  
University of California Davis  
Ph.: (530)752-1606  
Fax: (530)752-1537  
E-mail: mpparrella@ucdavis.edu*

Studies were conducted on the combined use of the eulophid parasitoid wasp

*Diglyphus begini* (Ashmead) and the entomopathogenic nematode *Steinernema carpocapsae* (Weiser) for control of the leafminer *Liriomyza trifolii* (Burgess) on chrysanthemums. Several factors indicated that these two agents were suitable for combined use: adult *D. begini* were not susceptible to nematode infection, leafminer larvae parasitized by the wasp were less susceptible to nematode infection, adult wasps detected and tended to avoid ovipositing on nematode-infected leafminer larvae, nematode-infected larvae served as host-feeding sources for the adult wasps, and nematodes showed equal orientation toward paralyzed/parasitized leafminer larvae and healthy leafminer larvae. Infection of *D. begini* larval stages by nematodes was seen in petri dishes and in intact leaf mines. The presence of nematodes in mines with wasp eggs decreased the chance of wasp survival to adulthood. IGP may be minimized through proper timing of natural enemy releases.

*Sher, R.B., Parrella, M.P. and Kaya, H.K. 2000. Biological control of the leafminer Liriomyza trifolii (Burgess): Implications for intraguild predation between Diglyphus begini Ashmead and Steinernema carpocapsae (Weiser). Biological Control 17: 155-163.* ❖

### Campus News & Updates

submissions can be directed to:  
Julie Newman, UCCE, Ventura & Santa Barbara Cos., Ph.(805)645-1459,  
Fax(805)645-1474 Email;  
[jpnnewman@ucdavis.edu](mailto:jpnnewman@ucdavis.edu)

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**Calendar of Industry Events**

**May**

15 ..... CORF Methyl Bromide  
 Alternatives Growers' School,  
 Location TBA, 831/724-1130

30 ..... CORF The ABCs of Horticulture,  
 Watsonville, 831/724-1130,  
 www.corf.org

**June**

20 ..... CCFC Grower Education Seminar,  
 831/728-7333

26 ..... CORF Field Flowers Growers  
 School, Ventura, 831/724-1130,  
 www.corf.org

27-29 ... SuperFloral Show, Indianapolis,  
 IN, 480/998-3992

**July**

4-8 ..... AIFD Symposium, San Diego,  
 831/724-1130

10 ..... KKRF Endowment Dinner, Santa  
 Barbara, 831/724-1130

10-13 ... CAFG&S, Fun'n Sun Weekend,  
 Santa Barbara, 831/722-2424

19-21 ... TSFA Annual Convention, Austin  
 TX, 512/834-0361

**August**

3-5 ..... FTD National Convention,  
 Nashville, TN 916/448-5266

4-6 ..... CSFA Floriculture Retreat,  
 Carlsbad, 831/728-7333

28 ..... CCFC Grower Education  
 Seminar, 831/728-7333

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