



CORF News

California Ornamental Research Federation

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Fall 1999

Transport Temperatures for California Cut Flowers - We're Making Progress!

By Dr. Michael Reid, Steve Tjosvold, and Jim Thompson, University of California, Division of Agriculture and Natural Resources

Introduction

Although we recommend that most cut flowers should be held near 32 F, industry practice is far from this ideal. In a detailed survey undertaken several years ago, we found that flower temperatures during transport were seldom below 45 F, and often above 50 F. In a recent study of a wide range of cut flowers, we have found that flowers held at 45 F have 30% shorter vase life compared with flowers at 32 F. This finding led us to conduct a more detailed study of temperatures during handling of California cut flowers and to propose a pilot program for addressing the deficiencies that we observed. We report here on the present status and conclusions of that program and suggest future possible actions.

California Fresh - A pilot trial to improve temperature management of California cut flowers during transportation

The goal of the *California Fresh* pilot

program is to ensure that flowers are pre-cooled after packing to 35 F and maintained at or below that temperature until arrival at their destination. We were fortunate to have the cooperation of a major wholesaler on the East Coast, who carries truckloads of California flowers across the country several times a week. We were also fortunate to have the cooperation of some of the major growers supplying the wholesaler. They agreed to pack their flowers so that they could be pre-cooled easily, to include temperature loggers and time-temperature indicators that we provided, to precool the flowers, and to probe and record flower temperatures as they left the dock.

Initially we have been monitoring a weekly truck shipment that leaves a northern California truck dock. The dock manager agreed to probe boxes on arrival, to pre-cool if needed, to probe boxes as they were loaded into the long-

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Redgum Lerp Psyllid Alert

By Dr. Karen L. Robb, UCCE, San Diego

In June of 1998, a new pest of eucalyptus, the redgum lerp psyllid, *Glycaspis brimblecombei*, was discovered in Los Angeles County on river red gum eucalyptus. This is a new introduction to California. This pest is now found attacking selected species of eucalyptus from San Diego County up north past the San Francisco Bay area. The good news is that there is no evidence that these psyllids attack the eucalyptus grown for cut foliage production. The bad news is that this

is a nuisance pest that will have to be dealt with for a few years, at least.

What species are affected? In addition to river red gum eucalyptus, *Eucalyptus camaldulensis*, this psyllid has been observed on *E. rudis* (flooded gum), *E. globulus* (blue gum), *E. diversicolor* (Karri), *E. sideroxylon* (red ironbark), *E. nicholii* (narrow-leaved peppermint), and *E. lehmani* (bush yate).

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Improved Postharvest Handling Practices Benefit Mellano and Company

By Dr. Karen L. Robb, Farm Advisor UCCE, San Diego

Several years ago, Mellano and Company made a major commitment to improving their postharvest handling practices. "We have always been a quality conscious company. However, we felt that we were falling short on our postharvest handling procedures. We made a commitment to develop a postharvest handling program to increase customer satisfaction by providing a better quality product with increased longevity," states Michael A. Mellano, of Mellano and Company. "We felt that the benefits would far outweigh the costs in the long run."

Mellano and Company has since determined that the commitment to do postharvest handling right was not an additional cost. Following their switch to smaller boxes and emphasis on proper precooling, their credit ratio has dropped to almost nothing. Mike notes that "Those companies who are doing a good job of grading, handling, and cooling their product are rewarded with higher returns and increased customer loyalty."

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Transport Temperatures

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haul truck, and record temperatures of boxes with an affixed 'California Fresh' label.

The East Coast wholesaler agreed to probe the boxes at arrival, record temperatures, recover temperature loggers, record the state of the time-temperature indicators, record the data on the labels, and send all the information back to us.

The equipment:

Temperature loggers

Our dataloggers are working very well, recording the temperature fluctuations that the flowers encountered on their journey across the country (Fig. 1 on page 8).

Time-temperature indicators

These specially manufactured stick-ons were put on two sleeves of flowers in each 'California Fresh' box, and have proved to be a consistent and reliable way of measuring the temperature history of a box of flowers. When the flowers are transported at the correct temperature, the labels remain green. They turn yellow when temperature management has been less than ideal.

Conclusions, so far:

1. Growers are not precooling flowers adequately: The growers participating in the trial have been actively improving their temperature management, and several are now cooling to close to the target 35 F. Monitoring of boxes at truck docks demonstrates, however, that this good performance is not common in the industry. We have measured temperatures as high as 65 F in boxes at the trucking dock. This poor performance is the result of several different problems:

- a. The grower does not have a coolroom.
- b. The coolroom/precooler is not operated correctly.
- c. The box does not allow good precooling. Proconas do not cool well, and some of the present hampers that are being used in the industry are almost impossible to cool.
- d. The grower relies on the trucking company to cool the flowers.

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Postharvest Handling Benefits

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When asked what growers should evaluate first in their postharvest programs, Mike is quick to respond "Refrigeration. A properly maintained cold facility should be the first priority of every grower. For those growers who don't have a cooling facility, they should get their product to a handler with proper facilities the day it is picked."

The next most important component in a postharvest handling program, according to Mike, is making sure that all the holding solutions you are using are doing the job. Perhaps the most important postharvest treatment is the use of biocides in water. Mike recommends that growers evaluate their crops and the different postharvest products that are available and determine which fit best into their handling systems. Mellano and Company is constantly evaluating new solutions and procedures.

Washing buckets is also an important component. There are many bucket washing systems available to growers to

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Olympic Hort. Products 1/2 pg. Ad

Postharvest Handling Benefits

Continued from page 2

reduce labor required for washing the buckets. That labor is somewhat offset by reduced labor required to separate buckets that have become cemented together with mud.

Customer education has been an ongoing process with Mellano and Company. "Some buyers don't understand the need and value of good precooling and handling. They want the product 'right now' and don't care what condition it is in. This requires that management maintain its commitment to proper handling," according to Mike.

The information needed to set up a good postharvest handling program is widely available. California growers need to be aware that their competitors around the world are using this information and doing a good job in their postharvest handling. Mike states, "It is important that all California growers get on the bandwagon and use good postharvest handling techniques, because all of California cut flowers are perceived as a single commodity. We need for this commodity to be perceived as the highest quality product available and a better value than our offshore competitors." ❖

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Field Observations

New Snapdragon Disease Associated with Viruses

A new disease found locally on greenhouse-grown cut snapdragons appears to be associated with two viruses. Diseased plants have leaves with "virus-like" ring patterns and yellow mottling that become more pronounced as the plants begin to flower. In the most severe cases, the affected plant's vigor declines significantly and most leaves have symptoms all the way up to the flower buds. In the first account of this disease, this late spring, most flowers were harvestable because the older leaves were mostly affected and could be removed at grading. The problem disappeared in the crops this summer, but in mid-September it again reappeared. Several snapdragon varieties are susceptible to this disease.

Initially, diseased plants were tested for 8 specific viruses with ELISA techniques. But none of these eight specific viruses, including the relatively common tomato spotted wilt and cucumber mosaic viruses, were present in the plants. Further study by state virologist Dennis Mayhew indicated 2 double-stranded RNA virus species were present in the diseased plants. Dennis states, "The findings indicate we are dealing with viruses that have never before been detected in snapdragon and/or are unknown viruses."

Please report any similar observations to me as we continue to try to identify the cause of the disease.

Regional Report

Santa Cruz & Monterey Counties

Black Tip of Red Roses and Foliar Calcium Sprays



Black tip on red rose buds has been a serious disorder affecting greenhouse cut roses along coastal California for many years. It is expressed primarily as black or brown areas on the tips of flower petals and can make the flower non-saleable or downgraded. Since darkening of red petals is a common response to a wide variety of factors such as high light, cold night temperature, and bruising, there has been some confusion about what constitutes black tip.

Black tip as it occurs in coastal California is first usually noticed at or near the tip of the bud and can progress down to the base of the petal as the tissue dies, and is found frequently on inner and outer petals. Serious symptoms usually are not noticed until after harvest: sometimes in the grower's cooler, during grading, or after shipment.

Experiments conducted by Dr. Richard Evans at UC Davis indicate that deficiencies of calcium in rose petals might cause black tip. Although high concentrations of calcium in the soil or hydroponic solution may exist, there might be circumstances when the calcium does not move adequately into the plant and the petals. A similar tip burn disorder on lettuce is caused by calcium deficiency, but the disorder is closely tied to environmental factors such as temperature, humidity, and light intensity. Black tip probably has similar complex interactions.

Dr. Richard Evans reports that predicting outbreaks of black tip by monitoring leaf calcium appears to be practical. The incidence of blackening of 'Royalty' decreased markedly as calcium concentrations increased in petals, and petal concentrations increased with leaf calcium up to about 1% in the leaf.

Can foliar application of calcium decrease blackening? Some reports in New Zealand and casual local observations indicate that this might be true. In early March, I was alerted by a grower about a new red rose variety that had nearly all flowers affected with black tip, and an experiment was begun. The plants were cut back March 14, were sprayed weekly (from March 22 through May 7) with a calcium chloride solution ("Stop It" at 2 quarts per 100 gallons and 200 gallons per acre) in replicated test plots.

Blackening was eliminated..... in both treated and non-treated plots! Calcium levels in leaves at harvest were virtually the same: 0.78 % for calcium-treated and 0.74 % for untreated. What is interesting, however, is that the initial level of leaf calcium was a dismal 0.54 %. One may suspect, that the initial calcium concentration was limiting and flowers were susceptible to black tip. With an increase in calcium level to around 0.75 %, due to unknown environmental and/or plant conditions, the flowers were not susceptible to black tip. Continued monitoring of the calcium level in this crop and monitoring associated black tip may help determine at what point the concentration of calcium is limiting.

Calcium applied to foliage is not going to cure black tip. There's a lot more to understand about the conditions that affect calcium petal concentration and the environmental factors that influence the incidence of black tip.

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Regional Report

San Diego County

New Runoff Restrictions Anticipated for Encinitas Growers



A lawsuit was recently filed by the environmental group BayKeepers against the City of Encinitas alleging that the city is in violation of the 1987 Clean Water Act. In order to avoid litigation, a consent decree has been agreed upon between the City of Encinitas, BayKeepers, and the courts. As a result of this consent decree, it is expected that new restrictions will be enacted to enforce the 1987 Clean Water Act and to ensure that only rainwater runoff enters the city's storm drain system. In case you are tempted to not read further, please note that BayKeepers have successfully sued other cities and are targeting additional coastal cities in the state. They are already preparing a lawsuit against Oceanside.

The 1987 Clean Water Act requires municipalities to eliminate the discharge of pollutants into their storm water conveyance systems to the maximum extent practicable through the development of a comprehensive storm water management system. This can be accomplished through structural (diversion, filters) and non-structural (education, minimization) methods, and by adopting 'Best Management Practices.' There are several aspects of water quality addressed by this Act, including: sulfate, taste and odor, temperature, total dissolved solids, toxicity, toxic pollutants, trihalomethanes, and turbidity.

The lawsuits prepared by BayKeepers do not specifically target agriculture or growers. Everyone, including homeowners, businesses, and the city will have to comply. The consent decree is expected to address illegal connections to storm drain systems, require enforcement of the 1987 Clean Water Act requirement that only rain water may enter storm systems, and require an extensive monitoring program to cover the 24 affected storm drains. The Regional Water Quality Control Board objectives and TMDLs (total maximum daily load) will be used as the standards of the monitoring program. The Regional Water Quality

Control Board will direct the monitoring program, the City of Encinitas will be the enforcement agency, and BayKeepers will be allowed to oversee the program.

Although growers are not being singled out, unmitigated agriculture runoff contains applied chemicals and sediment in quantities that exceed federal and state water quality standards. For growers operating within the city limits, this means that no water other than storm runoff will be allowed to leave the property and enter any of the city's creeks, gutters, or storm drains. Nursery runoff will have to be captured on-site, or eliminated through use of Best Management Practices.

The growers in Encinitas are taking a proactive approach to work with the city and to develop a strategy for voluntary compliance. A working group consisting of local growers, the San Diego County Flower and Plant Association, the Farm Bureau, the Resource Conservation District, and the University of California Cooperative Extension has been formed. In addition to assessing what individual growers can do, this workgroup will also seek opportunities for growers to work collectively in a neighborhood or to work with the city to develop a means of capturing runoff on a large scale during dry weather.

Bob Echter Receives Outstanding Person of the Year Award

Bob Echter, of Dramm and Echter, Inc. in Encinitas was recently chosen as the San Diego County Flower and Plant Association's 'Outstanding Person of the Year' for his positive impact on the floriculture industry. As told by Janet Silva Kister, last year's recipient, "Bob has set a shining example of innovation and commitment for us all."

Dr. Karen L. Robb

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Field Observations

Redgum Lerp Psyllid

Please see the front page article in this issue about this new pest.

Red Imported Fire Ants

There has been an additional find of the RIFA in San Diego County. The location of the find was immediately treated to eradicate the ants. The San Diego County Department of Agriculture, Weights and Measures is doing a tremendous job in locating and initiating eradication programs for RIFA whenever these ants are found. To date, the treatments have been very effective, and it is hopeful that the eradication efforts will be successful in the long run.

Rusts

Rusts continue to be a problem this year. I have seen serious rust problems on snapdragons, hypericum, geraniums, and sunflowers, to name a few hosts. There is some confusion about rusts. Although some species affect two distinctly different hosts, the other species infect only one kind of plant. Many rust species affecting ornamental plants affect only one kind of plant. In other words, geranium rust will not affect snapdragons. Since they are different species, the different rusts react to different pesticides, as well.

Rust diseases are favored by moderate temperatures, which we have been experiencing in abundance this year. Water is required for short periods (6-8 hours or less) for germination of spores and infection to occur. Once infection has occurred, water is no longer needed for development of the disease. Continued development, infection and spore production will continue for the life of the leaf.

Cultural control methods include not replanting crops in the same soil season after season and avoiding overhead irrigation.

Field Observations

Red Imported Fire Ant

The red imported fire ant (RIFA) has been kept out of San Mateo County, despite its being found on some incoming nursery plants from Florida. The Agricultural Commissioner in San Mateo County is avidly following the state's attempts to eradicate RIFA. Unlike some areas in southern California, where the fire ant has been found established outdoors, it is believed that the fire ant has been successfully controlled on the incoming nursery stock.

The red imported fire ant is common in many southern states, and was found last year in several areas in southern California. The ants are small, reddish brown, and can quickly produce many nests and colonize an area. RIFA shows aggressive behavior when disturbed and can quickly begin stinging a person or animal.

All growers should watch for stinging ant colonies in soil, containers, and other nursery supplies. If you suspect the red imported fire ant, contact your Agricultural Commissioner immediately. The University of California and the California Dept. of Food and Agriculture have a publication on the Red Imported Fire Ant, which is available through your local Cooperative Extension or Ag. Commissioner's office. The Winter and Spring 1999 issues of *CORF News* also had articles on RIFA.

Regional Report

San Mateo & San Francisco Counties

Eminent Domain, Open Space, and Farmland



in

last November to include the agricultural areas from Half Moon Bay to Pescadero. One concern for many in the agricultural community has been the ability of the Open Space District to use "eminent domain" to acquire farmland for open space, or to get access through farmland for trails to connect open space properties.

One concern that growers have about eminent domain is the forced sale of their property to the Open Space District, and the failure to get a fair market value for it. Some agricultural land in this county has been in the same families for many generations, and it has historic value in addition to its monetary value.

Although open space districts may just want trail access through agricultural parcels to connect open space areas, growers have legitimate concerns about public trails through their croplands. Concerns include the public and their dogs not staying on the trails, damage to crops by the public (or their dogs), and damage of theft of agricultural equipment. Pesticide use on agricultural land also becomes more problematic when hikers are nearby.

While eminent domain has not been used often by the MROSD, many growers are still concerned that the MROSD has the legal right to use it. The MROSD's Coastal Advisory Committee has been working to address the policy on eminent domain, and is looking at alternatives or restrictions to it. The county's Agricultural Advisory Committee recently declared their opposition to the use of eminent domain on agricultural land by the MROSD.

Land use issues and conflicts will become more numerous as California's population continues to increase, and development encroaches on, and adjacent to, agricultural lands. Throughout California, agricultural communities must be willing to address land

use issues relating to development, open space, agricultural smells and noise, and pesticide and water use.

While agricultural communities should certainly make known their feelings on issues such as eminent domain, they should also continue to look at alternatives, and to work with agencies such as the MROSD to develop policies that satisfy everyone in the community. Proper stewardship of all land, and protection of agriculture and open space, is of benefit to everyone.

Redgum Lerp Psyllid

A new insect pest of many species of landscape eucalyptus trees has spread quickly from southern California to the Bay Area. The psyllids suck sap from the leaves of the eucalyptus tree, then excrete a sticky material called honeydew. The psyllid nymphs use the honeydew to form a protective cap called a "lerp." Infested eucalyptus trees have notable white, cone-shaped bumps, or "lerps", scattered on the leaves. In addition to the visible lerps, the honeydew can make a mess on pavements below the trees, and the leaves can turn black from sooty mold fungi that grow on the honeydew.

Defoliation from the psyllids can weaken the eucalyptus trees, and make them more susceptible to eucalyptus long horn beetles. For control information, contact your local Cooperative Extension office for a publication on the redgum lerp psyllid.

Postharvest Workshop in Half Moon Bay

On Thursday, October 28th, a CORF sponsored workshop, "Postharvest Treatments for Floral Crops," will be held in Half Moon Bay. This half-day workshop will feature Dr. Michael Reid from UC Davis. For more information on this workshop call the CORF office at (707)462-2425

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Regional Report

Ventura & Santa Barbara Counties

CORF Grower Tour to the Innovative Nurseries of the Willamette Valley



This event held August 25-26 in the Portland, Oregon area, provided tremendous opportunities for learning, networking, and enjoying beautiful scenery. Twenty-one participants visited a diverse array of operations. These included a distribution center for bulbs and perennials; a cut bulb crop operation; a nursery that specialized in breeding and growing field-grown dahlias for cut flowers and catalog sales; a potted flower operation; a lily breeder; a packager and supplier for mass markets; a propagator and producer of florist azaleas; a field-grown cut flower producer who uses "biodynamic farming" methods to produce perennial flower beds; a large producer of greenhouse cut roses and field-grown cut greens; and a major supplier of annual, perennial, and holiday potted crops.

One of the highlights was a sumptuous dinner prepared by garden center owner Jack Bigej and his family at their home, surrounded by beautiful, tranquil gardens. One of the reasons the Bigeys have been so successful is that they use a "living fence" to attract customers to their garden center. While our host barbecued dinner, a tour of the greenhouses used for producing the gorgeous color plants sold at the garden center was provided.

The over all success of the tour was greatly due to the efforts of our guide, Dave Adams, retired extension agent and former Ornamentals Northwest Seminars Coordinator. Thank you, thank you, Dave!!! After the tour, participants could wander over to the Ornamental Northwest Seminars and hear a broad range of topics from such renowned speakers as Allan Armitage. All this, and free admittance to the Farwest Tradeshow, the largest green plant tradeshow in North America!

Santa Barbara Flower Growers Association Continues Public Relations Campaign. This association is continuing efforts to create a positive community image. Working with the public relations firm they hired, growers have appeared on several television shows; have had numerous newspaper articles, interviews, ads, and press releases; and have had several community speaking events. Currently, they are planning an open house for October.

California Fresh Project. As part of the California Fresh Project described in this issue, University of California post harvest physiologist Dr. Michael Reid and I visited the Wilsey Bennett facility in Oxnard in July and recorded temperatures in boxes containing floral products from all over California. An update of the California Fresh project will be presented at the CORF bilingual postharvest meetings to be held this October. Wilsey Bennett will host the event in Oxnard.

Rust on Hypericum. Hypericum is increasing in popularity as a cut flower, but is prone to rust. Two similar rust species have been reported on hypericum in California, *Uromyces triquetrus* and *Melampsora hypericorum*. CDFR recently confirmed that the causal organism of a particularly destructive infestation on young plants in a Carpinteria nursery was *M. hypericorum*. This fungus is so devastating in Austria that *H. calycinum* is no longer used there as an ornamental. On the recent CORF Oregon tour, one hypericum propagator/ producer reported excellent control of rust with Banner Maxx. For more details concerning rusts, see Karen Robb's Observations report.

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Field Observations

Downy Mildew Disease of Stocks

Commercial plantings of cut flower stock, *Matthiola incana*, in Oxnard developed a severe foliar disease last spring. Identified by Monterey County Farm Advisor Steve Koike as Downy Mildew caused by *Peronospora parasitica*, it was the first documented case on stock in California. Shortly thereafter, epidemic proportions of the disease reached the Lompoc Valley where stock growers still battle it. *P. parasitica* has previously been reported as a serious problem in Australia. Infected older leaves exhibit chlorotic areas on their top surface and slight twisting. Leaf undersides show extensive white fungal growth. Infected leaves turn yellow, then brown and prematurely fall. Depending on the infestation level, marketable stems are not produced, or require leaf stripping prior to sale. This fungus can infect other Brassicas, but spores from other Brassicas will not infect stocks. *Matthiola incana* and *M. bicornis* are both susceptible. No cultivated stocks show resistance to this fungus, but cultivar differences in sporulation has been reported. The good news for stock growers is that Heritage (Zeneca) just received registration on ornamentals in California, and can now be used for control. For information about this new biorational fungicide and on the general control of DMs see CORF NEWS 3(1): 4,7.

Redgum Lerp Pysllid

This new psyllid pest described in this issue by Karen Robb has heavily infested redgum eucalyptus (*Eucalyptus camaldulensis*) in Ventura and Santa Barbara Counties. In some areas the infestation is so heavy that it has spilled over into blue gums (*Eucalyptus globulus*). Ventura County Farm Advisor Jim Downer is planning fall trials evaluating systemic pesticides.

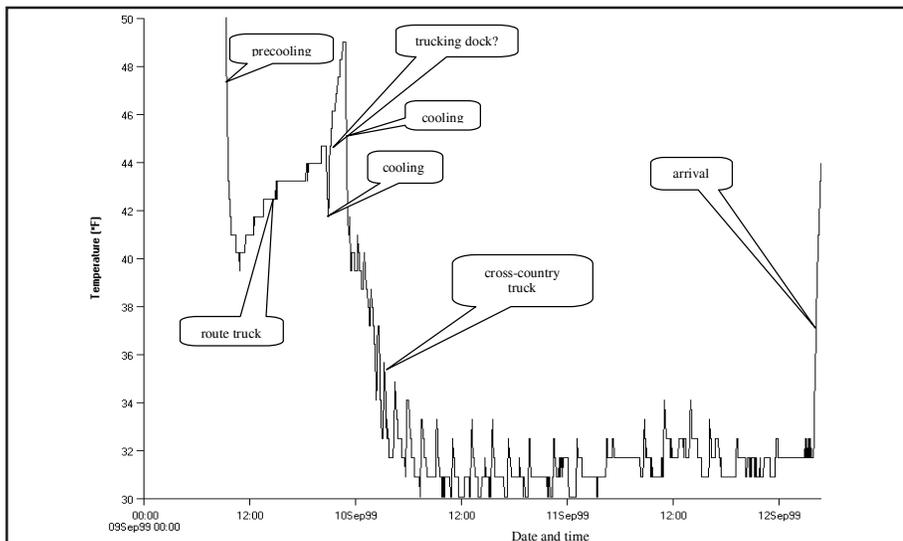


Fig. 1. Temperatures after packing, during transport, and shipping.

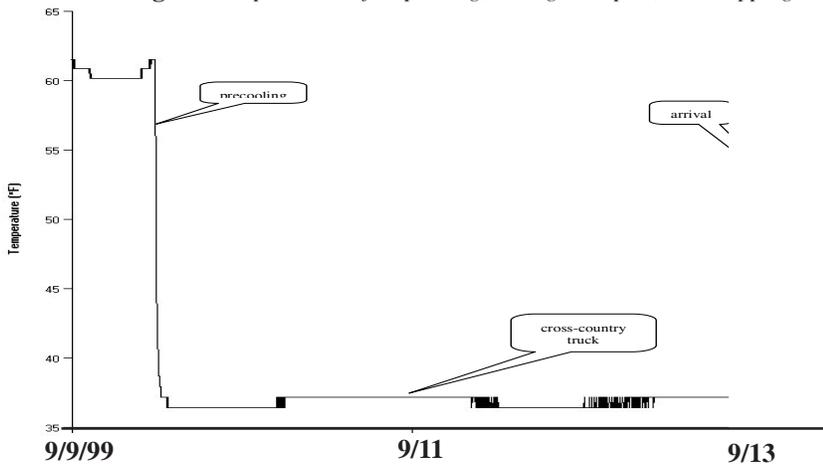


Fig. 2. Ideal Shipment: Record of temperature in flowers during cross-country shipment.

**Pacific Plant Health
Services Ad**

Farm Credit Ad

Transport Temperatures

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2. Route trucks are one of the weakest links in the flower handling system: Our graphs show that flowers that have been cooled often warm up again on their way to the trucking dock (Fig. 1). This may result from:

- a. No refrigeration in the route truck (especially when it is the grower's delivery truck).
- b. Loading the route truck at non-refrigerated docks.
- c. Placing warm flowers in the route truck, causing warming of flowers that were pre-cooled by other growers.

3. Consolidation docks must be refrigerated: Temperature loggers often show a substantial increase in temperature at the consolidation dock. These docks need to be properly refrigerated.

4. Cross-country trucks may do a satisfactory job of bringing the temperature down, even for flowers that have not been properly pre-cooled: Flower temperature often drops during the first 12 to 24 hours of cross-country travel, indicating that the trucks used in this trial are capable of bringing temperatures down for much of the product, even if it is loaded warm. But we should not rely on trucks to cool flowers because flowers may be at high temperatures too long before truck cooling, and many trucks make stops along their route and do not maintain temperature during unloading.

5. Flowers warm at arrival docks: Unrefrigerated docks at arrival can allow dramatic increases in flower temperature after arrival. We cannot expect good performance from California cut flowers if they are not provided with optimum temperature conditions throughout the entire handling chain.

Signs of improvement

The temperature profile obtained from one of our most recent shipments demonstrates the type of temperature profile that is the goal of the *California Fresh* program (Fig 2). The flowers were rapidly cooled to 36 F, and remained within 1 F of this temperature until they arrived at the destination wholesaler. This box was a hamper of iris, flowers with high heat capacity, and the temperature logger was placed in the middle of the hamper where variations in temperature would be

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Transport Temperatures

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attenuated by the cool flowers around it. Nevertheless, these flowers arrived in excellent condition, with a vase life close to that of the freshly harvested flowers. That is the goal of our research and the *California Fresh* pilot program.

Where to go from here?

The data that we have obtained highlights the problems and issues related to temperature management of cut flowers. The time temperature indicators, low cost enzyme-based systems that show whether the flowers have been exposed to excessive temperatures during transit, worked sufficiently well to be recommended for use in our industry. We recommend that the industry should empower truckers to refuse to carry flowers that are warmer than a reasonable maximum (say, 45 F), because of the difficulty of cooling warm flowers after they have left the grower and the harmful effect of warm flowers on already cooled flowers. This would greatly reduce the 'route truck' problem. Clearly the industry needs refrigerated docks at the grower, shipper, trucker, and wholesaler. We can ensure that California flowers obtain and maintain a reputation for freshness and quality only if every company in the handling chain keeps our flowers cold. The future of our industry depends on it. ❖

Redgum Lerp Psyllid Alert

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Biological Control: This strategy has the most promise for long-term control of redgum lerp psyllid. A search for effective natural enemies of redgum lerp psyllid is underway. Again, there is good news. This pest occurs at very low densities throughout Australia, where it originated, which is a good indication that the psyllids are held in check by effective natural enemies in Australia. Once natural enemies are identified, they must undergo evaluations for safety in quarantine before being released in California. Searching for, safety testing, mass rearing of natural enemies, and releasing natural enemies is expected to take a minimum of 12-18 months.

Cultural Controls: Although trees that are currently being irrigated should continue to be irrigated adequately, avoid over-watering or fertilizing the trees. Water should be slowly applied beneath the outer canopy and not near the trunk to saturate soil where feeder roots are located. Do not prune the trees except during the period between December and March to avoid potential problems with eucalyptus long-horned borer.

Chemical Control: Do NOT make foliar applications of insecticides to eucalyptus trees outside of container nurseries. Not only will the application be ineffective, but spray drift will be extensive. Trials are underway now to evaluate the efficacy of systemic insecticides against these psyllids.

Trials are underway evaluating selected systemic materials. Some of these show some promise; however, the complete information is not yet available. Be aware that some people are recommending certain pesticides that are not systemic in activity. A good example is Avid. This material has some translaminar movement (i.e. it moves from the upper leaf surface to the lower leaf surface), but it does not move systemically through the tree. Likewise, Triact is an oil spray and only works when it covers and smothers an insect and therefore should not be used as a systemic insecticide. ❖

For more information on this new pest, see the article on our website at <http://cesandiego.ucdavis.edu>. For more information on the status of the biological control program for this pest, see the following website: http://www.cnr.berkeley.edu/biocon/dahlsten/rglp/RLP_Main.htm.

Dramm Corp Ad

Campus News & Updates

Submitted by Julie Newman, Farm Advisor UCCE

Oleander Leaf Scorch

Oleander leaf scorch (OLS) has recently become a threat to the future of oleanders in Southern California. The disease has been confirmed in Orange, Riverside, and Los Angeles counties, and also reported in Texas and Arizona. It causes plants to appear drought-stressed and the leaves to have a scorched appearance. It may take 1-2 years before the oleander is completely killed. OLS is caused by the bacterial plant pathogen *Xylella fastidiosa*. The disease was first noticed during the 1980s, but the pathogen was not identified until 1995. Two insects have been identified as vectors of OLS: the glassy-winged sharpshooter (*Homalodisca coagulata*) and the smoke-tree sharpshooter (*Homalodisca lacerta*). We have ongoing research projects to identify which plants serve as hosts/inoculum sources in the environment and how infection spreads in the landscape. Control measures we are investigating include the use and effectiveness of severe pruning, resistant oleanders or other suitable replacement plants, and

preventative treatments. Currently, there is no easy answer to the control of OLS and no curative therapeutic treatments. The following tactics may provide some benefit: (1) practice good sanitation; (2) keep out infection when present, possibly by insect repellency/control, pruning/roguing of symptomatic plants; and (3) use plants resistant to infection, such as non-oleander replacements.

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The Effect of Soil Temperature on Root-knot Nematode Development.

The root-knot nematode, *Meloidogyne incognita*, is widespread throughout the world in areas with subtropical and tropical climates. In California it is one of the most damaging nematodes in ornamental plant crops, especially begonia, pansy, dianthus, celosia, and penstemon. The multiplication of nematodes is strongly influenced by soil

temperature, and each species has different temperature requirements. We studied the relationship between soil temperature and the time it took for *M. incognita* to complete one life cycle. At temperatures below 10 C and above 35 C no reproduction occurred. Between these temperatures, the nematode development was directly related to the temperature: at 30 C the first "new" juveniles emerged from the roots after only 20 days, whereas at 16 C it took 63 days. Thus, in areas with longer periods of high soil temperatures, this nematode can complete several life cycles during one growing season and thereby build up high numbers. These data are important for the prediction of nematode population levels over time, and for the development of management strategies.

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PANAM Performs

Campus News

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The Potential of Methyl Iodide as a Replacement for Methyl Bromide

During the last three years our interdisciplinary group has investigated methyl iodide (MI) as a potential candidate to replace methyl bromide (MBr) which is scheduled to be banned in the US by Jan. 1, 2005. Laboratory, greenhouse, and field studies have demonstrated MI's excellent efficacy against a wide range of plant pathogens, parasitic nematodes, and weeds. In fact, its spectrum of activity and efficacy was comparable to, or better than, MBr. Similar to MBr, MI penetrated plant tissues such as old roots in replant sites that might harbor soilborne pathogens or nematodes. In combination with chloropicrin the efficacy against plant pathogens increased synergistically. However, in contrast to the estimated stratospheric residence time of 1.5-2 years for MBr, the photolability of MI suggests a very short atmospheric lifetime and consequently an insignificantly small

ozone depletion potential. As a liquid at ambient temperature and pressure, MI is easier and safer to handle than MBr but can be applied with the same machinery. At a recent USDA workshop, the registration cost for a soil fumigant such as MI was estimated at \$10.5-15.5 million. This research has been generously supported by the California Association of Nurserymen, the California Fresh Carrot Advisory Board, and the Resource Conservation District of Greater San Diego.

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New Publications

Dr. Ann King, Farm Advisor, UCCE

Farm Labor Contractor Safety and Health Guide; available in Spanish and English; contact your local CalOSHA office (look in the California state government section of the phone book under "Industrial Relations Dept.").

GrowerTalks on Crop Culture 2; a guide to growing many major crops from *GrowerTalks* magazine's "Culture Notes" department; \$30; new from Ball Publishing, (888) 888-0013.

Pests & Diseases of Herbaceous Perennials: The Biological Approach; over 400 photos; \$70; new from Ball Publishing, (888) 888-0013.

Calendar of Industry Events

October

7.....CORF Grower Tour, Watsonville, 707/462-2425

8-10....CSFA Convention & Top 10 Competition, 916/448-5266

9.....SDCF&PA Live Plant Growers Assoc. Meeting, Encinitas, 760/431-2572

19-20....Western Nursery & Garden Show, Las Vegas, NV

20-23 .. Assoc. of Specialty Cut Flower Growers Convention, Worcester, Mass.

19.....CORF Postharvest Treatments for Floral Crops (bilingual), Watsonville

20.....CORF Postharvest Treatments for Floral Crops (bilingual), Oxnard

21.....CORF Postharvest Treatments for Floral Crops (bilingual), San Diego,

28.....CORF Postharvest Treatments for Potted Plants, Half Moon Bay
Phone CORF for information on the previous four events, 707/462-2425

November

16-18....International Horticulture Conference, Ft.Lauderdale, FL

December

7.....CORF Laws & Regs Workshop, Carlsbad, 707/462-2425

9.....CORF Laws & Regs Workshop, Watsonville, 707/462-2425

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