



CORF News

California Ornamental Research Federation

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Weed Management in Field Grown Flowers with Yardwaste (Greenwaste)

By Dr. Clyde Elmore, Weed Specialist, UC Davis, Dr. Ann King, Farm Advisor, San Mateo County and Steve Tjosvold, Farm Advisor, Santa Cruz & Monterey Counties

Weeds are found in almost all field grown flower crops. The weed species may vary from site to site, time of year, and year to year. Most weeds are removed with cultivation and hand weeding, because only a few crops have selective herbicides registered. A project has been underway to evaluate new herbicides, some older herbicides, and new methods of weed control in southern, central and northern California.

An old method of weed control has been to "smother" the weed seedlings as they germinate. Weed seedlings are susceptible to light manipulation. Some species must have light to ger-

minate and all need light to continue growth after germination. By eliminating light with mulch materials (organic or synthetic) weed seedlings of annual and perennial weeds can be controlled. As part of this project two greenwaste mulches 1) finished fine composted greenwaste and 2) coarse ground "six week" greenwaste was applied around transplanted snapdragons, China aster, Delphinium, sunflower and over Dutch iris bulbs after planting. The mulch thickness was from 2 to 3 inches in all tests.

Snapdragon transplants were from 1/2 to 3/4 inch seedlings. Application of

See Weed Management - Page 9

Postharvest Management Geraldton Wax Flower

By Dr. Michael Reid & Linda Dodge
UC Davis Environmental Horticulture

Geraldton wax flower, *Chamelaucium spp.*, is native to Western Australia (around the town of Geraldton), where it grows as a wild shrub. The standard wax flower (*C. uncinatum*) is available as a number of named varieties, ranging in color from the white 'Alba' to pink forms 'Newmarracarra', 'CWA Pink' and 'Mullering Brook' through to the deep purple 'Purple Pride'. These flowers have become an important "filler" for bouquets, produced in substantial quantities in Israel and more recently in Australia and California. Various techniques have been

See Wax Flower - Page 12

Who is Living on Your Land?

by Eric Larson, Executive Director, San Diego County Farm Bureau

For a number of years an Oceanside, California farmer allowed farm workers to live in makeshift huts in the ravines surrounding his farm. The workers enjoyed the convenience and affordability while the grower perhaps thought he was doing a favor for the workers. Then tragedy struck one night when a hut caught fire. One worker died from his burns and a second was seriously burned.

In a lawsuit brought by the deceased's family, the Superior Court found in favor of the grower because the workers "voluntarily chose to live in the ravine, and the risk of fire was an obvious risk."

In a far-reaching and precedent setting case, the 4th District Court of Appeal

in San Diego has now reversed the original court decision and ruled that farmers have an obligation to make sure that housing made available to farm workers is safe. "Moral blame," the court said, "attaches generally to the failure to provide habitable living conditions where there is a duty to do so."

Key to this case was the fact that the grower had knowledge of the camp's existence and exercised a level of control over the camp and those who lived in it. This ruling now sets the stage allowing the case to proceed to a jury trial where the farmer's negligence and liability will be determined.

All growers should take serious note of this case and understand that the

courts could view any form of housing on farm property as being provided by the grower and subject to all applicable health and safety regulations.

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New Publications

Dr. Ann King, UC Cooperative Extension

"Natural Enemies Handbook: The Illustrated Guide to Biological Pest Control". This excellent publication is for growers, PCAs, landscape professionals, home gardeners, students, academics, and anyone else who is interested in natural enemies or managing pests with biological control.

Written by Dr. M.L. Flint and Dr. S.H. Dreistadt of the UC Statewide Integrated Pest Management Project at UC Davis, the 154-page book contains information on biological control of most floricultural insect pests and mites. It also contains a useful "Quick Guide" to help identify the natural enemies that are most likely to help with specific pests.

"Natural Enemies Handbook", publ. #3386 (softcover; \$35) or publ. #3386-H (hardcover; \$50) is available from UC DANR Publications, (800) 994-8849.

Internet Sites on Weeds & Weed Control

Dr. Heiner Lieth, Environmental Horticulture, UC Davis

UCDavis has recently begun to develop Research and Information Centers for a variety of topics. These centers have statewide focus and are designed to be repositories and distributors of information both to advisers and specialists within the University as well as to the general public. In addition to making information available on paper, these centers also try to provide web pages. The ones most closely related to production of ornamental crops in California are OHRIC (Ornamental Horticulture Research and Information Center) sponsored by the Environmental Horticulture department) and WRIC (Weed Research and Information Center). WRIC's web site is at <http://wric.ucdavis.edu/> and OHRIC is at <http://ohric.ucdavis.edu/>. As yet there is not a lot of information there but that is likely to change over the next year. One very useful bit of weed-related information is the Weed Susceptibility (to herbicides) Chart edited by

Dave Cudney on the Weed Information page at the WRIC site.

When hunting for information on the Internet there are numerous search engines that are available to help you. For the most part you have to be careful how you do your search with these so that you get the information that you want. Interestingly, each of the search engines gives you a different result with the exact same search words. One search facility, called "Ask Jeeves" (at <http://aj.com/>) allows you to do a search using a number of search engines simultaneously. For example, if you "ask" the phrase "Oxalis Weed Control Greenhouses" (note you don't have to formulate a complete question) you get results that include encyclopedia entries for "weed" and "oxalis" (each with further links on these items) as well as 21 matches from other search engines (WebCrawler, Excite, Lycos, and Alta

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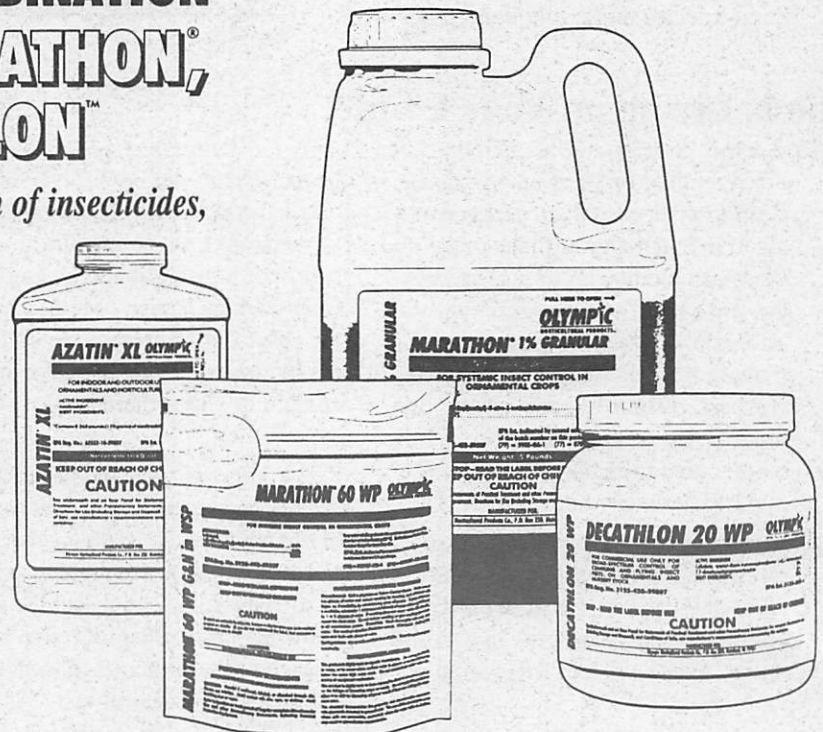
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Creeping Field Cress: A New Weed in California

by Dr. Clyde Elmore, UC Davis Department of Vegetative Crops, Weed Science Program

A weed that has the potential of becoming one of the worst weeds in ornamental production, has arrived in California. This weed is creeping field cress (*Rorippa sylvestris*). This perennial was introduced to the US from Europe in about 1818. Known as *kiek* in the Netherlands, it has become more common in ornamental plantings over the years, especially with the recent increase in popularity of herbaceous perennials. It has spread widely in container, greenhouse and field plantings, probably through repeated introduction. In its native habitat, *R. sylvestris* is commonly found along stream edges and other wet areas, so it is ideally suited to nursery and container culture because of the frequent irrigation. Rhizomes of the weed have been

found intertwined in the root systems of bareroot herbaceous perennials and bulbs that have been shipped to the US from Holland. In addition, the weed is also shipped within the US on domestically grown bare-root and potted perennials. This cress is very winter hardy, very difficult to control and is not recognized by many nursery professionals and landscapers.

Creeping field cress seems to set seed sparingly, but spreads rapidly from rhizomes with many buds. Leaves are finely divided and resemble those of watercress, one of its close relatives. It features small, yellow flowers, with flower stalks reaching 6 to 12 inches tall. The plant has shallow rhizomes that rapidly initiate new shoots, though rhizomes have been found to 2.5 feet in a sandy soil. The plant first appears from the rhizomes as a low rosette with dark green

finely divided leaves (It looks very similar to London rocket, and annual). Additional leaves form on the rosette but also new plants emerge from the rhizomes. The rhizomes may grow a distance from the mother plant before forming a new rosette. As the plant matures a flower stalk with multiple small yellow flowers are formed.

We have seen the invasive potential of creeping field cress and are very concerned about the possibility of this plant becoming a serious weed in most areas of the US. State and County agricultural inspectors and University extension advisors should be looking for this plant. Signs include fine white rhizome pieces that can be found as part of the root mass, crown, bulb or tuber, especially if the plants are shipped bare root. Since there seems to be no selective control, ornamental plants should be

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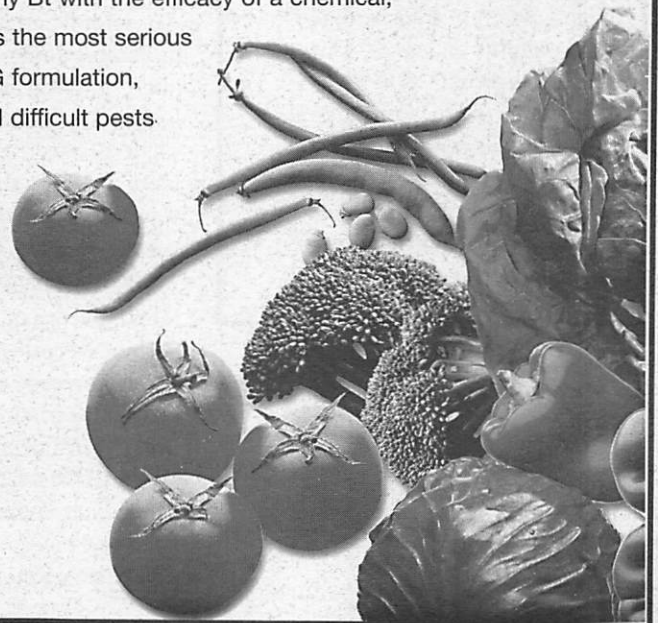
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Field Observations

New Pest & Diseases

Creeping Field Cress (*Rorippa sylvestris*)

A new weed species for California was found in San Diego this Spring (see summer issue, CORF News) and now, I'm unhappy to report, in a northern California nursery. It has the potential to become a serious weed in greenhouse and field ornamentals throughout the state. Be on the alert for this weed so that its spread can be impeded. See the accompanying article in this issue of CORF News for more information on it and its identification.

Saponaria leafspot

Saponaria ocymoides has been found in a field flower nursery infected with *Alternaria*. The species of *Alternaria* has not been identified. But in this case, it is probably *Alternaria saponariae*. This disease has been noted in the literature in other states, but not in California. Greenhouse experimental studies have begun to identify the *Alternaria* species and whether it could spread to other carnation members such as Sweet William. The leafspot consists of rather large (4-5 mm.), round, necrotic areas with red halo patterns on leaves. The disease is promoted by rainy weather or overhead irrigation. Although no experimental studies exist, one might attempt preventative control with fungicide such as iprodione, chlorthalonil, or mancozeb.

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Regional Report

Santa Cruz & Monterey Counties

Gerbera Integrated Pest Management



Greenhouse grown Gerbera must have the world's record for the greatest intensity of pest and disease problems. Serpentine leafminers, greenhouse whiteflies, western flower thrips, powdery mildew, and *Botrytis* are all significant problems. Cut flower and container Gerbera crops are sprayed a lot!

As part of grants from the American Floral Endowment and the California Department of Pesticide Regulations, I initiated a scouting and IPM demonstration at a local Gerbera cut flower greenhouse. Early this year, we began by intensively sampling for insects and diseases in nearly an acre of greenhouse cut Gerbera. A practical, weekly, scouting plan was determined and implemented to help quantify pest populations and incidence of diseases.

A strategic plan was made to implement biological control, first in the early Spring for leafminers using the parasite *Diglyphus isae* as they began to show up and later in the Spring for greenhouse whitefly using the parasite *Eretmocerus eremicus* and for western flower thrips using the predatory mite *Amblyseius cucumeris*.

An integral part of our plan to implement biological control was to try to only use non-residual or selective pesticides, when necessary. For example, pyrethroid insecticides, were eliminated completely 6 weeks before introducing *Diglyphus*. It was important to know what chemical would be used in case the biologicals would not adequately control the pests.

So far, the use of the *Diglyphus* has been a major success in controlling leafminers. It was not easy or inexpensive however. I attribute our success with biological control of leafminers, ironically, to the availability of the relatively leafminer-specific insecticide, cyromazine (recently registered as Citation). Three weekly applications were necessary to keep the leafminer

under reasonable control while the *Diglyphus* could reproduce and establish themselves at a level that adequately controlled the leafminers. Later in the summer another three applications of cyromazine were applied when a western flower thrips outbreak forced us to use acephate (Orthene). Apparently the *Diglyphus* were thrown out of ecological-balance. After the cyromazine applications, *Diglyphus* again regained control of the leafminers and, incredibly, without any new parasite releases. Control of greenhouse whitefly with *Eretmocerus* has been very poor. Currently, we have little evidence to suggest why this might be. To control whitefly we tried various "soft" pesticides that we thought would not be disruptive to the *Diglyphus*. Of those tried, imidacloprid (Marathon), pyridaben (Sanmite), azadirachtin (Azatin), and *Beauveria bassiana* (BotaniGard), it was the pyridaben applications that were effective and apparently not disruptive to the leafminer parasites.

It is difficult to access the level of control of western flower thrips with *Amblyseius cucumeris*. In one case, during releases of the predator, we do know that control was not adequate. A "panic" level of thrips led to the only Orthene application. *Beauveria bassiana* and Azatin probably helped control thrips, did not provide adequate control in at least this one case.

On several occasions, it was necessary to remove older leaves and associated leafminer larvae and whitefly nymphs. This was especially important for whitefly control where we were relying on chemicals that needed to contact the pest. We were lowering the pest population and making it easier to do a good job in spray coverage. Yellow sticky films were placed down each row just above the crop to trap out leafminer and whitefly. We feel that this film's ability to trap adult pests outweighed the negative effect of trapping parasites.

Regional Report

San Diego County

Africanized Honey Bees - Bee Prepared



Africanized honey bees (AHB) - also called "killer bees" - became established in Texas in 1990 and have spread to other

southern states. Currently, Imperial, Riverside, San Bernardino, and San Diego Counties are considered to be "Africanized" and the areas affected by AHB will continue to spread in California.

Although its "killer" reputation has been greatly exaggerated, the presence of AFB will increase the chances of people being stung. Learning about the AHB and taking certain precautions can lower the risk of being injured by this new insect in our environment.

The Africanized honey bee is closely related to the European honey bee used in agriculture for crop pollination and honey production. The two types of bees look the same and their behavior is similar in many respects. Neither is likely to sting when gathering nectar and pollen from flowers, but both will sting in defense if provoked. A swarm of bees in flight or briefly at rest seldom bothers people. However, all bees become defensive when they settle, begin producing wax comb and raising young.

Africanized honey bees and European honey bees BOTH: look the same; protect their nest and sting in defense; can only sting once; have the same venom; pollinate flowers; and produce honey and wax. Africanized honey bees are less predictable and more defensive than European honey bees. Africanized honey bees are more likely to defend a greater area around their nest; will respond faster in greater numbers; can sense a threat from people or animals 50 feet or more from the nest; sense vibrations from power equipment 100 feet or more from nest; will pursue a perceived enemy ¼ mile or more; swarm frequently to establish new nests; and they

nest in small cavities and sheltered areas.

Africanized honey bees nest in many locations where people may encounter them. Nesting sites include: empty boxes, cans, buckets or other containers; old tires; infrequently used vehicles; lumber piles; holes and cavities in fences, trees or the ground; sheds, garages and other outbuildings; and low decks or spaces under buildings. It is important to remove potential nest sites around nursery operations. Be careful wherever bees may be found.

As a general rule, stay away from all honey bee swarms and colonies. If bees are encountered, get away quickly. While running away, try to protect face and eyes as much as possible. Take shelter in a car or building. Water or thick brush does not offer enough protection. Do not stand and swat at bees; rapid motions will cause them to sting.

The side bar lists general precautions and what to do if stung. Copies of Bee Alert brochures are available through our office. These brochures contain Africanized honey bee facts and recommended safety precautions and are available in English, Spanish, Vietnamese, Cambodian, Laotian, Hmong, Chinese, and Korean. A single copy can be obtained by sending me a SASE. A packet of 100 brochures can be purchased for \$6.50. Make checks payable to UC Regents.

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Precautions & Guidelines for Working in the Presence of AHB

1. Be observant. Walk around the area to be worked and observe for excessive bee activity.
2. Be aware of your surroundings and plan escape routes. If your vehicle or nearby buildings are locked, have keys readily accessible.
3. Remove possible nesting sites before a hive is established.
4. Power equipment, i.e. tractor, weed eaters, mowers, tend to disturb the AHB from greater distances. Once disturbed, they will summon other AHB from the hive and pursue you a great distance.
5. If attacked by any bee colony, retreat as rapidly as possible to an enclosed structure or vehicle. Some of the bees will follow you in, however, a smaller number than what is following behind. Air-conditioning will slow the bees' activity.
6. Do not attempt to exterminate the bee colony yourself. The techniques and equipment required for this task are beyond most individuals. Even professional exterminators receive specialized training in the handling of bees.
7. Contact the appropriate people. In the event of an immediate life threatening situation, call 911!. For non-life threatening events, contact the Agricultural Commissioner's office in your county.

What To Do If Stung

1. Go quickly to a safe area
2. Remove stinger as soon as possible. Pulling out the stinger will not release more venom than if you scrape it out. The important thing is to get the stinger out fast.
3. Wash sting area with soap and water like any other wound
4. Apply ice pack for a few minutes to relieve pain and swelling
5. Seek emergency medical attention if breathing is troubled, if stung numerous times or if allergic to bee stings

Field Observations

New Pest & Diseases

Entyloma Leaf Smut on Yarrow

A yarrow (*Achillea millefolium*) grower in Half Moon Bay has had problems off and on for many years with a white, powdery fungus that occurs in spots on the leaves of his yarrow plants. Dr. Timothy Tidwell at the CDFA Plant Pest Diagnostic Center in Sacramento diagnosed it for me as *Entyloma* leaf smut, caused by the fungus *Entyloma compositarum*.

Dr. Tidwell said that the smut has a wide host range in the composite family. It goes to a lot of hosts, including yarrow, calendula, ambrosia, asters, echinacea (purple coneflower), erigeron, gaillardia (blanket flower), lettuce (probably including wild lettuce), madia, senecio, and more.

Diseases of Field-Grown Flowers, 1993 (McCain and Paulus) recommends mancozeb fungicides for *Entyloma* smuts.

Diseases & Pests of Ornamental Plants, 5th ed. (P.P. Pirone) recommends gathering infected plants and discarding them in the fall; changing the location of plantings; and spraying the plants with a copper fungicide.

Other fungicides that are used on a broad range of leaf fungi diseases may be effective on *Entyloma* smut, but always check the label before trying a new fungicide.

Regional Report

San Mateo & San Francisco Counties

Cover Crops for Flower and Vegetable Fields



Richard Smith (UCCE Farm Advisor in Monterey County) and Rich Casales (USDA Natural

Resources Conservation Service) gave a terrific Cover Crops Workshop in Half Moon Bay on September 10th. They gave many good reasons for using cover crops during the winter months, or at any time when fields are unplanted for at least 45 to 60 days.

Cover crops add significant nitrogen to the soil (if a legume cover crop is used), they add organic matter to the soil when plowed in, the cover crop roots can help break up compacted soil, and they help prevent soil erosion. The two types of cover crops that do well in the north-central coast are legumes and cereal crops. Legumes have the advantage of adding nitrogen to the soil. Cereals have the advantage of breaking up soil with their more-extensive root systems. Richard Smith estimated the cost of growing a cover crop at about \$100 per acre — this includes seed purchase, planting, and turning it in. In return, legume cover crops can add 150+ pounds of nitrogen per acre each year, which can significantly reduce fertilizer costs in the following season.

Peak nitrogen production by legumes is at the start of the flowering period, so cover crops are best turned in to the soil during the flower period. With cereal crops it is important to turn them into the ground before they set seed, or the seed can germinate and interfere with the next flower or vegetable crop.

Some of the varieties that were recommended for this area include Cayuse oats or triticale as cereal crops. Cayuse oats cost a little more than other cereals, but they take a long time to

flower, which gives you extra time to get it turned in before it goes to seed.

Recommended legumes include bell bean (fava bean), purple vetch, and lana vetch.

It was recommended that a cover crop mix be used because each species of cover crop cannot be expected to grow well every single year. A recommended mix for this area was: Cayuse oats or triticale (20%), bell bean (40%), purple vetch (20%), and lana vetch (20%). Planting recommendations were to get the seed in the ground by mid-October, planted 1-inch deep, followed by a 3-inch application of water. In a normal rainfall year, it may not need additional rainfall.

The cover crop should then be incorporated into moist soil 3 to 4 weeks before planting the cash crop.

For more information, UCCE has a publication, *Covercrops for California Agriculture*, publ. #21471, \$3.50, available in Spanish for \$7.50; (800) 994-8849. Also check the UC SAREP web site for cover crop information:

www.sarep.ucdavis.edu/ccrop/

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Regional Report

Ventura & Santa Barbara Counties

Investigate Before You Invest



New products for horticultural use frequently appear on the market. These often have real merit; they do a job and help you make a profit. A few

have even contributed to important advances in the industry. Some products, however, are of questionable value. They may be grossly overpriced, ineffective, or both.

Questionable products usually carry an enormous markup on their price to pay for an extensive sales campaign. The active ingredient may be the same as that in a well-known, reputable product, but the quantity used is less because of its "new formulation" or "magical properties." In such cases, the price per unit of active ingredient is much higher than for the well-known product.

How do you determine which products you should be wary of buying? What clues should you look for? The promotional patterns for products of questionable value have common, identifiable characteristics. Such sales campaigns may include statements and claims such as the following:

1. The product contains "a secret or unknown ingredient that is very potent—almost magical in its benefits,"
2. Remarkable results are achieved because the product operates on a "newly discovered, secret principle or an entirely new approach," and
3. The benefits claimed are supported by large numbers of "unsolicited" testimonials; data from properly conducted trials or research are seldom presented.

Often I hear that a grower knows that a new product worked great for pest control (for example) because after using it, the pest population in his nursery went down. However, because an untreated control

was not used, and because insect populations naturally fluctuate, there is no way of determining whether the pest population declined because of use of the new product, or because of other factors in the environment.

When you decide to try a new product, buy just enough to treat a small portion of your greenhouse or field. Compare the results with another plot of equal size in which you did not use the product but where all other operations and conditions were identical. If possible, replicate your "experiment," i.e. try a minimum of three small plots with the product and three without the product, to help eliminate fluke results. Then compare yield records or other measurable results.

Don't assume that because the product was developed in Europe or because another grower swears by it, that the product is effective and will work well under the conditions of your operation. Carefully evaluate all new products. Demand adequate proof of their value.

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Field Observations

Biological Control of Whiteflies on Poinsettias

The use of parasitoids in nurseries to control whiteflies is increasing. I recently received a number of calls from growers requesting information on the use of compatible pesticides that can be used with *Encarsia formosa* and *Eretmocerus californicus* to supplement control of greenhouse and silverleaf whiteflies on poinsettias. University of California studies conducted by Dr. Michael Parrella and others have shown that *Beauveria bassiana*, a commercially available entomopathogenic fungus, (Botanigard, Mycotech Inc) is effective in controlling whiteflies on poinsettias and other floricultural crops. In addition, last year we demonstrated that a crop of poinsettias could be produced using a combination of this fungus with *E. californicus* at only a slightly higher cost than a conventional pesticide program. This study was conducted at Coast Nurseries in Somis, and was part of our statewide IPM monitoring demonstration project funded by the American Floral Endowment, the California Department of Pesticide Regulation, UC IPM/Smith-Lever, the California Association of Nurserymen, the California Cut Flower Commission and the Hansen Trust. We surmise that this biological control program could be more cost effective by reducing the number of applications of parasitoids, since Botanigard is effective alone. To test this, we are starting a project with Dr. Parrella, his lab staff, and Dr. Karen Robb where we will compare the cost and efficacy of three pest management programs on poinsettias: (1) use of Botanigard alone, (2) combination of Botanigard and parasitoids, and (3) use of conventional pesticides.

New Standards Proposed for Pest Control Advisers

Dr. Ann I. King, *Environmental Horticulture Advisor, UCCE*

A new press release from the California Department of Pesticide Regulation notes: Prospective agricultural pest control advisers (PCAs) may be required to take more college courses related to integrated pest management and sustainable agriculture. PCAs are licensed by the Department to offer recommendations to farmers and others on agricultural pest control.

DPR's Pest Management Advisory Committee concluded an upgrade was necessary if PCAs were to produce recommendations that incorporate reduced-risk pest management strategies. The proposed regulations would allow the current PCA minimum qualifications to remain in effect through December 31, 2002. This is designed to lessen the im-

part of the proposed changes on persons now doing course work or obtaining required technical work experience. A DPR survey indicates several state community colleges and California State University campuses offer the proposed required courses. However, the University of California, Davis, is the only UC campus which offers all the necessary courses to fulfill the proposed requirement. Other UC campuses are expected to add the required courses by the time the regulations go into effect.

Copies of the proposed regulations are available on DPR's Web site www.cdpr.ca.gov, or by calling Fred Bundock at (916) 324-4194. Comments may be submitted until 5 p.m. on November 2, 1998. E-mail comments may be sent to dpr98004@cdpr.ca.gov. Address written comments to: Fred Bundock, Department of Pesticide Regulation, 830 K Street, Sacramento 95814.

Internet

Continued from page 2

Vista). In each case you can select what you want to peruse or go directly to one of these search engines to do further work. This a pretty quick way to find a variety of information that might be available.

When it comes to highly technical information, however, the Internet is still lacking. With weed control, for example, you can find products that you can buy or results from some relatively recent research projects because the persons posting the information have a motive for posting this material. However when it comes to textbook information or the type of information that you might learn in a short-course, then an author is motivated to NOT post the information since doing so could cut into book sales or course attendance. As a result, using the Internet is a great place to start your search, but you should not assume that what you get is complete.

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Janice Wills, Kee Kityama Research Foundation

With a history spanning more than 100 years, California's floriculture history is as varied as its residents. From the earliest farmers to the high-tech nurseries that are operating today, California has a rich heritage that cannot be duplicated.

Early Chinese immigrants came to California to work in gold mines during the Gold Rush. After the Gold Rush ended, the push for a transcontinental railroad came, and Chinese immigrants greatly assisted that effort. After railroad work ended, and the Chinese Exclusion Act was enforced, agriculture and gardening were the only "approved" activities for the Chinese. Fortunately, times changed and the Chinese Exclusion Act was repealed. Until the Alien Land Law was ruled unconstitutional, many Chinese immigrants leased land and grew labor-intensive crops such as chrysanthemums, heather, hydrangeas and sweet peas. Real estate boomed in the 1950s, and many Chinese flower growers sold their land on the San Francisco peninsula and moved south to Morgan Hill. Charlie Chin has been credited with using the first electric lights in the greenhouse to delay bud set in chrysanthemums, allowing them to grow taller with a longer stem.

Some of the earliest known commercial flower nurseries were started near

Oakland, California, in the 1890s by the Domoto family. The 4 brothers were born in Japan and immigrated to the United States in the 1880s. After working for several years independently, the brothers pooled their resources and started a nursery, and a tradition. In the 1920s, the brothers began bringing students to the U.S. from their village in Japan and educating them in the U.S. This became known as the Domoto College.

While the Domotos were educating Japanese immigrants, floriculture was taking off in north San Diego County. In 1883, John Frazier dug the first well in the north county to supply water to its 126 acres near what is now Carlsbad. This was the beginning of the agricultural boom in the area. Several years later, Luther Gage came to the Carlsbad area to grow gladioli, freesias, ranunculi and anemones. Gage was the first Carlsbad-area grower to ship winter glads to the Los Angeles Flower Market and is also credited with introducing bird-of-paradise as a commercial crop in the north county. Around this same time, young Paul Ecke, Sr., planted his first poinsettia crop in Encinitas.

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Weed Management

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the mulch was difficult because the seedlings were so small that some plant coverage occurred. Early vigor of the plants was similar to the untreated plants with the coarse mulch but vigor was reduced with the fine finished mulch. Stem yield was reduced slightly compared to the weeded check treatments. Weed control was adequate down the row but there were some weeds right at the plant base. Similar results were observed with the China aster plants. Early plant vigor was good where the coarse mulch was applied but the vigor was decreased with the fine mulch. Yield was decreased with both green waste treatments compared to the weeded control treatments. Increased vigor was noted in Delphinium after application of fine mulch greenwaste on the transplants. Vigor of the Delphinium after coarse mulch treatment was similar to the weeded control treatment. The flower stem number was also increased on those plants treated with the fine mulch compared to the weeded treatment. Annual weed control was very good with 3 inches of fine mulch. Annual bluegrass, chickweed and common groundsel were controlled, however bur clover germinated on the edge of the treatment and grew into the plant row. Sunflower was not affected in post transplant treated plots at Davis. No effect on vigor or yield was observed.

Dutch iris was planted at the Bay Area Research and Extension center (BAREC) and at the Weed Research Center at Davis. Both the fine and coarse mulch increased early vigor. Growth appeared normal except harvest was delayed slightly at both locations with the mulch treatments compared to the control or herbicide treated plots.

This research was funded by the California Cut Flower Commission and Kee Kitayama Research Foundation. Additional experiments are planned for the 1998/99 season at BAREC and Davis.

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University of California News

The University of California State-wide Smith-Lever IPM Project funded a proposal to create "Insect Collections for Field Scout Pest Identification Training". More than 60 of the most common pests and beneficials of floricultural crops were collected, mounted, preserved, and labeled as they became available through the season. A total of ten insect collections were completed, and a set was distributed to each farm advisor and IPM advisor associated with ornamental production in the state. Each cooperator was also provided with collection materials to maintain or add to collections to provide examples of regional or newly introduced pests. These collections will be maintained and used by farm and IPM advisors in a variety of training programs to provide clientele with a

"hands on" experience with the actual pest or beneficial insects. Insect diagnostic training will allow farm advisors, growers, pest control advisors, master gardeners, and other clientele throughout the state to properly identify pests and beneficials they may encounter. Clientele such as pest control advisors can then make better pest management decisions by matching the correct pesticide (if needed) to the insect pest. This will help reduce the number or amount of non-effective insecticide treatments.

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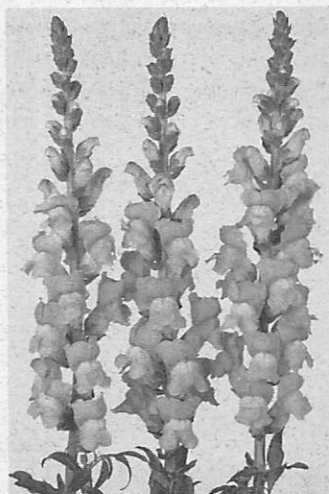
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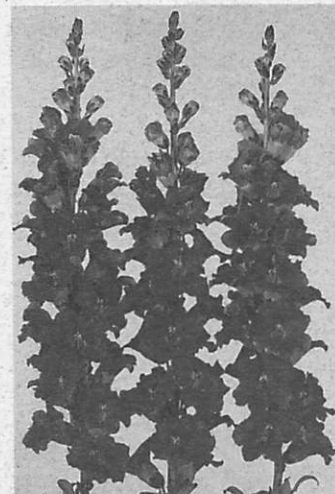
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Rorippa

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cleaned before shipping, or destroyed so the rhizomes will not spread the weed to new locations. As nursery professionals, it is important to be alert for this plant and not allow it to be planted in nursery stock plants or sold to unsuspecting homeowners.

Heritage

Continued from page 9

Unfortunately, this first crop was destroyed by a fierce Santa Ana wind. Enough propagating wood was saved from Ecke's Encinitas crop and from the crop near Hollywood for a crop the following year.

Early growers like Thomas McLoughlin, Donald Briggs, Sr., E.G. Thornton, and the Frazees are credited with producing some of the best and most diverse flower crops in the area. These were not easy times for flower growers and when World War II started, times became even harder for growers across the state. During the Japanese internment, Paul Ecke, Sr., was among several growers who stored farm equipment and household goods for his friends who were removed from their homes. In northern California, similar acts were taking place as Italian growers continued the businesses of their Japanese counterparts.

In 1967, complete with 31 family members and a 100,000 square foot greenhouse, Case, Hank, John and Bill Van Wingerden set sail from their native Naaldwijk, Holland, for Carpinteria, California. News of the Van Wingerden's success reached Holland, and other Dutch growers were inspired to immigrate as well. The ideal climatic conditions and the strong economy and infrastructure of the California coast made growers like Wim Zwinkels and the Brands feel right at home.

The history of California's floriculture is well documented and ever changing. Many families have made selfless contributions, and the industry is forever in their debt.

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Floriculture education from the
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Wax Flower

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developed to manipulate their flowering season, and the availability of subRetail florists will want to use a preservative solution. Many commercial preservatives will work effectively, improving the vase life of the flowers. The sugar in the preservative solution helps open the immature buds, but concentrations of sugar above 2% (rarely found in properly-mixed preservative solutions) may damage the foliage.

Storage

Geraldton wax flowers have been successfully stored for up to 2 weeks at 34°F. There was no benefit of wet over dry storage, and dry storage would be

the method of choice. The major problem during storage results from growth of *Botrytis* on the flowers. Dipping in a 1% solution of iprodione prior to storage has been shown to prevent *Botrytis* infection. Other fungicides may also be effective, and the fungicidal dip may allow storage for even longer periods of time. *Botrytis* infection is aggravated under storage conditions that permit condensation of water on the flowers or buds. Temperatures in the storage room should be steady (+/- 1°F), and bunches should be placed in plastic wraps only after they have been cooled to the storage temperature.

Upcoming Grower Educational Events

October

- 1 Fresh Produce and Floral Council Exposition and Educational Sessions, Anaheim 714/739-01777
- 1-4 California State Floral Association Design Show & Top 10 Competition, Carlsbad 916/448-5266
- 8 CAFG&S Golf Tournament, Hollister 408/496-6187 x 10
- 15 CORF Tour, San Diego 707/462-2425

November

- 8-13 CCFC Trade Mission, Denver 916/852-5166
- TBA ... CORF Spray Applicator Workshop, Half Moon Bay 707/462-2425

December

- 1-3 CCFC Board of Commissioners & Committee Meetings 916/852-5166
- 2 Hall of Fame Award Dinner & Presentation 831/724-1130
- 5 San Diego Country Flower & Plant Association Holiday Party, Del Mar 760/431-2572
- 11 *CORF News* layout deadline, 707/462-2425



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