



Ka Lono Pua

"The Flower News"

Vol. IX No. 3, August 2002

Cooperative Extension Service Oahu

County

Summer's Challenges and Opportunities

For many flower growers the summer is a slower season and the quick pace of the spring holidays is past. Many growers have an abundance of flowers that are a challenge to sell. There are a number of opportunities in the next months for finding markets for those flowers. Take advantage of them.

Although many diseases usually subside in the drier weather, insects and especially mites often take their place as "Growers' Enemy # 1". This year may be different because of the wetter "El Nino" summer. Be alert for fungi in the warm humid days of summer.

In this issue of "Ka Lono Pua" you will find a chart that lists the miticides that are registered for ornamentals. Don't rely strictly on the chart without reading the accompanying article on controlling mites. There are other things to know and do to minimize their damage.

Go out there and market those flowers, but watch out for the mites!

In This Issue...

- ◆ Mite Are Not Insects
- ◆ New CTAHR Publications
- ◆ First Annual Agricultural Conference
- ◆ Ornamental Miticide Chart.....and more

Future Happenings

- Aug 13-15 Pesticide Risk Reduction Course
- Aug 16-18 Made in Hawaii Festival - NBC
- Aug 16 Statehood Day Holiday
- Aug 11-17 Internal. Hort Congress, ASHS, Toronto, Canada
- Aug 16-18 Nursery/Landscape Expo, Houston TX
- Aug 22-24 Farwest Show & Ornamentals Northwest Seminars, Portland OR
- Aug 24-25 Kaimuki Orchid Show, Kilauea Rec. Center
- Sept 2 Labor Day
- Sept 18-21 Assoc. of Specialty Cut Flowers Nat. Conf. & Trade Show, Madison Wis. 440 774-2887 www.ascfg.org.
- Sept 21 Foster Garden Plant Sale
- Sept 30 – Oct 2 Internat. Plug and Liner Conf., Lake Buena Vista, FL
- Oct 10-13 Honolulu Orchid Show, NBC
- *Oct 24 First Annual Agricultural Conference, Waikiki
- Oct 14 Columbus Day
- * See Newsletter for details.

English Daisy Rust Hits California Growers

An outbreak of the quarantine fungus Puccinia lagenophorae (English daisy rust) has been found at four nurseries in San Diego County, according to the San Diego County Flower & Plant Association. Symptoms include orange pustules on all green parts of the plants. So many pustules form that the shape of the leaf or stem can become distorted. In addition to English daisy, dusty miller (Senecio cineraria) is now known to get this fungus.

The weed, common groundsel, Senecio vulgaris is especially susceptible to this fungus. An important control measure is to eliminate this weed upwind from or anywhere near where English daisy or dusty miller are grown or propagated. Since the fungus has become widespread in California very quickly, a request has been made to Calif. Dept. of Food and Ag. to change the status from a quarantine pest to a common one so plants would have to be "commercially clean," but not entirely disease free.

Until the weather turns hot and dry, growers of susceptible crops including English daisies (Bellis perennis) and dusty miller (Senecio cineraria) have been advised to implement a preventive fungicide program.

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Immediately after she received the bill for the extraction of a tooth, a woman phoned her dentist. "I'm shocked," she complained. "This is three times what you normally charge!"

"I know," replied the dentist, "but you yelled so loud you scared away two other patients."

-Larry Wilde

## New CTAHR Publications

### New For-Sale Publications:

Rights-of-way weed control, a guide for commercial pesticide applicators PRRE-2, 32 pp.

Turf and ornamental pest control, a guide for commercial pesticide applicators. Barry Brennan, Sabina Swift, and Charlie Nagamine. PRRE-3, 40 pp.

Fliers and order blanks can be found at <http://www.ctahr.hawaii.edu/ctahr2001/PIO/ForSalePubs.html> or by calling the local CES office.

### New Free Publications:

The publications listed below by their subject category are now available for downloading from the CTAHR free publications Web page. Go to <http://www.ctahr.hawaii.edu/ctahr2001/PIO/FreePubs.asp> or by calling your local CES office.

#### Economic Issues (EI)

Agriculture's contribution to Hawaii's economy--an update Summary, PingSun Leung and Matthew Loke EI-3, 7 pp.; EI-3b, 1 p.

#### Financial Connections (FC)

Earned Income Tax Credit boosts worker income. Ron Wall FC-60, 1 p.

#### Ornamentals and Flowers (OF)

Pikake. Ken Leonhardt and Glenn Teves OF-29; 4 pp.

#### Publications and Information Office

Publication request line: (808) 956-7046

# Mites Are Not Insects

Mites are in the class called arachnida with spiders and scorpions. They live in almost all habitats including ocean floors, deserts, hot springs, deep soil, mountaintops and tundra. Most are predatory or parasitic on other animals including humans, with only a few feeding on plants. Over 30,000 different mites and ticks have been described and thousands remain undescribed.

Unlike insects which have 6 legs and three body segments, adult mites have 8 legs and one main body part with no head. The front of the body has a feeding structure called a gnathosoma. Most mites that feed on plants are very small and require a microscope to see and identify. They damage plants by sucking the contents of individual plant cells.

**Scout! Scout! Scout!** To avoid an explosive outbreak of mites growers have to be looking for them. Scouting the crops on a regular basis enables growers to take early action to avert disaster. Once the mite population has developed into a heavy infestation, it is very difficult to regain control and damaged crops may not be salvageable. Walk through the crop at least once a week. Make it a ritual on a specific day and time to spend at least a half-hour or more looking for mites. Look closely at individual leaves and flowers. With a good naked eye many mites look like tiny moving dots. You can often spot the mites on leaves even with very little or no damage. Remember that many mites do not damage plants!

**Spot the mites before you spot the damage.** Early detection can allow spot treatments that reduce the amount of pesticides required to gain control. That saves time and money. An essential piece of equipment used in scouting is a hand lens. A 10x, 15x, 20x or a 2" x 4" magnifying glass can be used. Tapping a leaf or plant over white paper will knock some mites off. They are easier to see walking around on the paper. Yellow sticky traps cannot be used for most

mites. By recognizing that mites are present, causing damage and identifying the species you can select the best method of controlling them.

**Mark indicator plants** that you check before and several days after pesticide applications to determine the effectiveness of your miticides. Select plants that are in the middle of the row as well as in the aisles to ensure you are getting good coverage. Watch for trends over time and take notes of your observations. Using a rating system helps to quantify your observations and help you make decisions about control options.

**The spider mites** in large numbers produce silk webbing, which is usually visible. This webbing is used for protection and as a sail to aid in their dispersal. They cause leaf stippling, which is a number of very small white or yellow spots. If the mites are not stopped, the damage continues until the spots merge and give a bronze or tan coloring to the leaves. If enough of the leaves are damaged, the plant will defoliate and may even die. However, the aesthetic and economic damage can occur much earlier.

Spider mites migrate via the wind or movement of plant material. Scout the plants around doors and openings where they might blow in.

**Carmine Spider Mite, Tetranychus cinnabarinus** attacks nearly 100 cultivated crops and weeds. It is a serious pest on many flowers and ornamental plants such as carnation, chrysanthemum, cymbidium, gladiolas, marigold, pikake, and rose, as well as many vegetables and fruits in Hawaii.

According to Dr. L. Goff, the carmine spider mite has the largest host range of all Tetranychidae species in Hawaii and is of greatest economic importance. Adults and nymphs feed primarily on the undersides of the leaves. The mites tend to feed in "pockets" often near the midrib and veins.

The carmine spider mite can complete a life cycle from egg to adult in about a week. All stages of

this mite are present throughout the year. Reproduction is most favorable when the weather is hot and dry.

Adult females are about 1/50 inch long, reddish, and more or less elliptical. The males are slightly smaller and wedge shaped. They have a black spot on either side of their relatively colorless bodies.

The adult female may live for up to 24 days and lay 200 eggs.

**The two-spotted spider mite (TSSM) or *Tetranychus urticae*** is probably the worse over all ornamental mite pest. It has over 300 host species including many ornamentals and weeds. TSSM also thrives in hot, dry weather and seems to have a particular affinity to water stressed plants. They are less than a millimeter in size (1/25 of an inch) and have two distinct spots on each side of the body.

For color pictures and more information on Spider mites on the internet check out:  
<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7405.html>.

**False spider mites**, also known as flat mites are related to spider mites, but do not spin webs. In general they are half the size of the carmine spider mites and reddish in color with black patterns. When they feed, the leaves become silvery followed by a tanning then a blackening. Females lay only 40-60 eggs, and the life cycles range from 26-30 days. Because of their longer life cycle and lower fecundity they are usually not as big of a problem as the spider mites. The Phalaenopsis mite, *Tenuipalpus pacificus* is found in this group.

**The thread-footed mites** are so named because the fourth pair of legs on the females end in two thread-like hairs. Cyclamen and Broad mites are the two in this group that cause problems for ornamental growers. They are very small mites being only 1/100 of an inch long. They are susceptible to low humidity and direct sunlight.

Because they are often protected in the buds and distorted plant tissue, contact miticides are not very effective in their control. Also because of their small size and location on the plant, it is very difficult to identify them. A 20x lens or dissecting microscope is needed.

**The Cyclamen mites** hide in protected locations like buds and flowers. They attack foliage plants, African violets, ivy, mums, and begonias. The buds of affected plants become curled and distorted. Often the damage looks like thrip damage or a chemical burn. The life cycle is 5 to 21 days and the females lay from 12 to 50 eggs.

**Broad mites**, sometimes called the tropical mites, are in the same family of mites as the Cyclamen mite and cause a similar damage. When they feed on leaves, a puckering, curling or wilting will occur. They often attack the growing point or terminal end of flower sprays causing distortions and death to the buds. The symptoms may be misinterpreted to be a virus, some other disease, or chemical phytotoxicity. They are often a problem on begonia, azalea, geraniums and African violets. The life cycle is 4 to 6 days and the females lay about 20 eggs.

**Lewis mites** are a problem on Poinsettias and other greenhouse plants. They are slender, straw or greenish colored with several small spots along each side of the body. They are smaller than the two-spotted spider mite, and also produce webbing. They cause leaf stippling and yellowing, and the leaves' upper surface often is mottled or speckled. In severe infestations, leaves will turn completely yellow and fall off the plants.

The CTAHR web site at:  
<http://www.extento.hawaii.edu/kbase/crop/Type/mitemenu.htm> has more information about some of these and other mite species.

**To control mites** early detection and identification is essential for effective and efficient control.

**Natural enemies** of mites often keep them in check in times when the environmental conditions do not favor them, and when chemical pesticides have not killed them. The major natural predator of the carmine spider mite is a Stethorus beetle. This beetle feeds on all stages of these mites and in laboratory conditions each individual beetle consumed an average of 2,400 mites. The feeding activity of the predatory beetle is greatest in crops with smooth leaves on their undersides. There are a number of other ladybird beetles which feed on mites, but they are not as effective as Stethorus.

Predacious mites, such as Phytoseiulus macropilis, are also effective on many crops in controlling carmine spider mites. There are also several species of predatory thrips that feed on mites. And you thought all thrips were bad. There are certain flies and general predators such as the minute pirate bugs, bigeyed bugs and lacewing larvae that attack mites. Although some of these are available commercially, we are prohibited from importing them to Hawaii.

We can however take measures to conserve their populations by using selective pesticides instead of broad spectrum ones that kill everything. Some insecticidal applications will kill off the predatory insects and allow mite populations to increase rapidly. Some like carbaryl actually stimulate spider mite reproduction. Also carbaryl, some organo-phosphates, and some pyrethroids apparently favor spider mites by increasing the level of nitrogen in the leaves. Insecticidal soap has a reputation of being easy on many predators. Use spot applications that allow predators to survive in the unsprayed areas.

**Cultural controls** can help in reducing mite populations. Because of the wide range of host plants for many plant-feeding mites, it is very important to eliminate weeds which are alternate hosts. If you sell plants as opposed to cut flowers, it is sometimes better to discard heavily infested plants that cannot be sold rather than try to salvage them in the next crop cycle. Make sure

incoming plants are free of mites before placing them near other crops.

Spider mites thrive in dusty conditions so keep dust down by using water to clean off walkways and other dusty areas. Directing a forceful spray of water at the plants will keep populations down. Remember to do this when the plants can dry, and the weather conditions don't favor fungal and bacterial diseases. Overhead irrigation may help, but most mites are protected under the leaves.

**Chemical controls** should be used when plant-feeding mite populations have reached a threshold where the cost of chemical application exceeds the cost of their economic damage and other controls have failed to stop their increase. Select a miticide that targets the particular species of mite that is causing the problem. Consider the growth stages of the mites and which miticide controls those stages. Try to select a chemical that does not affect beneficial organisms.

In applying the miticides, be sure you cover the plant part where the mites reside, especially if you use a contact miticide. Often this means spraying the undersides of the leaves. Effective spider mite control requires two sprays, 7 - 10 days apart. For false spider mites a 14 to 21 day interval can be used.

Mite resistance to various chemicals has been reported in a number of species – especially in the spider mites. To avoid mite resistance developing, rotate miticides from different classes with different modes of action. For more information about mite resistance management see the article at:

[http://www.olympichort.com/ohp\\_research\\_mites.html](http://www.olympichort.com/ohp_research_mites.html). Whenever using any pesticide, study the label including the fine print and follow all the instructions.

#### References:

- Donovan, K., 2002 Scouting for Mites Part II, Greenhouse Product News, Jun 2002
- Hara, A., 1985 Mite Management on Ornamentals, Proc. 3<sup>rd</sup> Fert. & Orn. Short Course

Krantz, G.W., 1986, A Manual of Acarology 2<sup>nd</sup> Ed., Ore S. U. BookStores Inc., 509 pp.

KnowledgeMaster a U.H. website produced by EXTension ENTOMology & UH-CTAHR Integrated Pest Management Program.

## **Tax Credit Available for Agricultural Innovations**

If you have expended funds or labor to develop a new variety or hybrid plant, or a new method of planting, spraying or some other process, you can file a claim for this credit starting with 2001. That's right, money back from last year! The credit is 20% of your development costs.

How did this come about? In 1999 and 2000 the state legislature passed Acts 178 and 297 that encourages high technology industries through tax incentives. In 2001, Act 221 was passed that further encourages the continued growth and development of technical businesses by expanding and clarifying prior tax incentives and provides additional tax incentives for technical and non-technical businesses. The act brought Hawaii's laws in line with some of the federal tax code.

This tax incentive is a credit for investing in a new technology, product or process. Remember a credit is an amount you receive regardless of how much state income tax you pay – if any. It is not just a deduction!

The incentive runs from 2001 through 2005. The credit is worth up to a maximum of \$2,000,000 graduated over five years (35% to 10%) from the date of investment. The credit is capped at varying amounts (\$700,000 in the year the investment is made to \$200,000 in the last year).

The state tax form needed is the revised N 318 (Hawaii Technology Business Investment Tax Credit). For more information contact your accountant, the Hawaii State Tax Office at [http://www.state.hi.us/tax/hi\\_tech.html](http://www.state.hi.us/tax/hi_tech.html), or Ed at 622-4185.

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Lindquits R.K., 1995, Spider Mites Have Returned!, Ohio Florists' Association Hotline, No 9, June 1995

Ohlendorf, B (ed.) 2000 Spider Mites, UC, DANR Publication 7405

Sanderson, J., 2002 Cyclamen, Broad Mite Problems on the Rise, Greenhouse Business, Feb 2002

The only limits are, as always, those of vision.

- James Broughton

First Annual Agricultural Conference Planned

The Agricultural Leadership Foundation of Hawaii, the Hawaii Farm Bureau Federation, and CTAHR are co-sponsors of the First Annual Agricultural Conference. It will be held in conjunction with the HFBF annual meeting in October. The Agricultural Conference is scheduled for October 24, all day, at the Sheraton Waikiki Hotel. It is titled "Changing Times: Creating Opportunities for Hawaii Agriculture". It will feature: an interactive plenary session and open discussion on the future of agriculture, eight concurrent workshops in leadership, innovation, best practice, and marketing in agrobusiness and agrotourism; a keynote luncheon speaker, silent auction; and an evening networking reception and trade show.

The HFBF annual meeting will be held October 25, also at the Sheraton Waikiki, and farm tours will be conducted October 26. For more information or to register for the First Annual Agricultural Conference, contact Alan Tin (tin@verizon.net, 808-732-2294).

Hawaii Business Development Partnership

Recently the College of Tropical Agriculture and Human Resources (CTAHR) was awarded a grant to host the Business Development Partnership (HBDP). It was formerly known as Manufacturing Extension Partnership. The HBDP is a fee for service program that helps

businesses improve their performances. The program uses experts from a wide variety of fields from across the country to help businesses that are willing to invest in themselves. More information will be coming soon about this exciting program. For more information see: <http://www.mep.nist.gov/index.html>

New Anthurium Varieties Released

The College of Tropical Agriculture and Human Resources has released three new cultivars of cut-flower Anthuriums. 'Hokuloa' has a white spathe with a yellow to white spadix and a heart shape. 'Hokuloa' is the Hawaiian word for the planet Venus – the brightest object in the sky besides the sun and the moon. 'Hilo Moon' is a companion cultivar having a glossy white spathe and a yellow-green spadix.

There are subtle differences between the two. 'Hokuloa' has a slightly larger flower – 5 ½ x 4 ¾ inches compared to 'Hilo Moon's' 5 x 4 inches. 'Hokuloa' produces an average of 6.8 flowers/year, and has a shelf life of 37 days. 'Hilo Moon' produces 8.3 flowers a year and has a 22-day shelf life. Both are moderately resistant to bacterial blight and anthracnose.

'Waimea' Anthurium has a bright red spathe and a spadix that is orange-red that turns to red-purple. The flowers are heart-shaped with slightly overlapping lobes. They are 5 ¾ x 5 inches. It is also moderately resistant to bacterial blight and anthracnose and fills the niche that was held by the blight-susceptible 'Ozaki'. It produces 6.3 flowers/year and has a 28-day shelf life.

Go to <http://www.ctahr.hawaii.edu/ctahr2001/PIO/FreePubs.asp> to see a copy of the publication and pictures describing the new anthuriums.

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Employer: "Here's the official letter on your raise, John. I hope you're satisfied with it."

John: "Thank you very much, boss. And here's the tape recording of our last Christmas party."

- Joseph Lozanoff

## "Ka Lono Pua" Goes Electronic

Because the cost of mailing out "Ka Lono Pua" is high in regards to printing, producing and posting, we will happily e-mail copies to those that have access to e-mail.

If you would like to receive "Ka Lono Pua" by e-mail, contact us so we can add your address to our listings. If you don't have e-mail or we don't know what it is, you will continue to receive a regular copy of "Ka Lono Pua."

If you have any questions or suggestions, give me a call at 622-4185, Tuesdays and Thursdays or e-mail me at [mersino@hawaii.edu](mailto:mersino@hawaii.edu).

Mahalo!

Edwin F. Mersino  
County Extension Agent  
Agriculture Program

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After she woke up, a woman told her husband, "I just dreamed you gave me a pearl necklace for Valentine's Day. What do you think it means?"

"You'll know tonight," he said.

That evening, the man came home with a package and gave it to his wife. Delighted, she

opened it-to find a book entitled *The Meaning of Dreams*.

-Le Hérisson, France

- What are the miticides that are available for ornamentals?
- Which mites are the biggest problems for growers, and how can you control them?
- What are the newest U.H. anthurium cultivars?
- How can new innovations get started?
- What can you do besides spraying to control mites?

The answer to these and many other questions can be found inside.