



Ka Lono Pua

"The Flower News"

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Cooperative Extension Service Oahu

County

Give Cultural Pest Controls A Chance

Although this issue of "Ka Lono Pua" has several articles that relate to pesticides, it is up to each of us to minimize their use. Not only can they endanger you, your family and workers they can contaminate the environment. Following the labels' directions and using pesticides safely are essential for reducing the danger and potential for contamination. But it is impossible to completely eliminate them.

A number of cultural control alternatives to applying pesticides are considered too time consuming or costly. But consider the high cost of the pesticides and the costs of applying them. Often the efforts taken to reduce pest problems using non-chemical methods are longer lasting than a quick chemical spray. Cultural control techniques can make pesticide applications unnecessary. When used together with chemicals, a more effective pest control is often achieved. Think about non-chemical controls before you pick up the sprayer again.

In This Issue...

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- ◆ Thrip Resistant Plants
- ◆ When is a Soap not a Soap
- ◆ New Insecticides and Miticides
- ◆ Dimethoate Label Changes.....and more

Future Happenings

- | | |
|-------------|---|
| May 4-5 | Manoa Orchid Show, Noelani School |
| May 9 | DOGAH Meeting |
| May 11 | Foster Botanical Garden Plant Sale |
| May 12 | Mother's Day |
| May 18 | Orchid Growing I, Scott Mitamura
Ho'omaluhia Bot. Garden |
| May 25 | Orchid II, Scott Mitamura,
Ho'omaluhia Bot. Garden |
| May 27 | Memorial Day |
| June | Perennial Gardening Month |
| Jun 4 | HSI Board Meeting, Honolulu |
| Jun 6-8 | Amer. Hort Society Conf., Seattle,
WA |
| Jun 11 | King Kamehameha Day |
| Jun 14-16 | Aiea Orchid Show, Aiea Elem.
School |
| Jun 16 | Father's Day |
| Jun 17-18 | Integrated Pest Management Conf,
San Luis Obispo, CA |
| Jun 18 - 22 | Hawaii International Conference on
Business |
| Jun 19-22 | Southeast Greenhouse Conference,
Greenville, S.C. |

Thrips Resistance Through Promoters and Inhibitors

Plant Research International, Wageningen, the Netherlands, has initiated research on whether the incorporation of protease-inhibiting genes can lead to thrips resistance in chrysanthemums. This follows thesis research for the University of Wageningen completed by Seetharam Annadana, a Plant Research International guest staff member from India, who developed new techniques permitting the genetic modification of two-thirds of the available varieties for chrysanthemum. Annadana also identified better “promoters”, or genetic switches, that ensure that genes incorporated into the chrysanthemums will be sufficiently active.

Researchers hope to develop chrysanthemum resistance to insects, especially thrips, with the help of this technology. Presently, thrips damage can only be adequately prevented using chemical pesticides; consequently, various ecological practices cannot be applied. The development of thrips-resistant chrysanthemums would mean using far less chemical pesticide – or even none at all.

Annadana investigated what type of genes could be used to make chrysanthemums resistant to thrips, discovering that genes encoding protease inhibitors – the substances that inhibit the activity of certain enzymes in thrips’ digestive tracts – might be suitable. Many plants create protease inhibitors naturally when attacked by insects. The researcher tested the effectiveness of various inhibitors and found that egg production was reduced by as much as 50 percent.

- From Greenhouse Product News Jan 2002

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A countryman between two lawyers,  
is like a fish between two cats.

- Benjamin Franklin

## Dole Receives International Certification

Dole Fresh Flowers was recently certified as having an active environmental management system. The third-party certification is administered by SGS International Certification Services, which grants ISO14001 certification. Dole is now the only ISO certified flower grower in the world. The certification ensures that the company’s management program covers all flower production processes, postharvest operations, integrated and disease pest management control, labs, service areas and bouquet production.

Dole was required to comply with a series of strict national laws and regulations dealing with environmental controls. These included preservation of natural resources, minimization and control of residues of solid waste, controls to prevent air-borne contamination and utilization of only crop protection products permitted by the EPA.

Dole also has strict systems in place to preserve human health and prevent accident or health-related diseases associated with labor conditions. The company will refuse to work with other companies that do not comply with ISO 14001 regulations.

Dole is required to abide by certain procedures. Informing employees at all levels about the labor and environmental rules and regulations is just one of these. Besides documenting compliance, Dole must allow monitoring by external auditors. After the initial certification, the auditors carry out a 6-month check up.

Dole Fresh Flowers operates more than 21 flower farms with 11,000 employees, and opened a new, state-of-the-art facility in Miami, Fla., in December of last year. Contact information for the new facility is Dole Fresh Flowers, 1005 NW 12<sup>th</sup> Street, Miami, FL 33172, (800) 333-1223 (phone) (305) 591-2081 (fax).

# Update on New Ornamental Insecticides and Miticides

Arnold H. Hara, University of Hawaii, CTAHR

This presentation was given at the 4<sup>th</sup> Annual Hawaii Orchid Growers' Association Conference, March 2, 2001, in Hilo and has been updated with the most current information on insecticides and miticides.

Currently, the agrochemical industries are marketing many 'new chemistry' pesticides that are effective against the target pest and are considered "reduced risk" or safe to humans and the environment. Although orchids and other commercially grown ornamentals in Hawaii are hosts to various pests, our state has managed to stay free of more serious pests that occur elsewhere in the world. Over the past 40 years, Hawaii has had an influx of 15 to 20 new insect species per year, of which, one or two have become serious pests of ornamentals. We need to continue our efforts to keep new pests excluded from Hawaii by strict quarantine regulations and effective quarantine treatments.

Results of a growers' survey conducted in April 2000 ranked the following pests as causing the greatest damage to ornamental plants:

- |                   |                                  |                                 |
|-------------------|----------------------------------|---------------------------------|
| 1-Slugs/Snails    | 4- Soft Scales and Root Mealybug |                                 |
| 2- Spider mites   | 5- Western Flower Thrips         | 7- Spiraling whitefly, whitefly |
| 3- Armored Scales | 6- Nematodes                     |                                 |

Sixty of 131 growers surveyed were orchid growers. The respondents perceived research trials on effectiveness and phytotoxicity of new insecticides as the most important ways in which the University of Hawai'i could assist the state's ornamentals industry.

## EFFICACY OF NEW SNAIL AND SLUG PRODUCTS

Pesticides are referred to by Brand Name (common chemical name, Manufacturer name).

Molluscicides tested against the two-striped slug, *Veronicella cubensis*, included Mesurol Pro 2% bait (methiocarb, Gowan); Sluggo Bait 1% (iron phosphate, Monterey); and Deadline MPs (minipellets) 4% (metaldehyde, Pace). Tests were conducted at the University of Hawaii at Manoa, Waiakea Research Station, using standard 12" x 12" x 3.5" wooden test cages with plexiglass covers. Each cage contained a layer of 1:1 cinder and peat moss mixture and 10 slugs. All three products were applied at the rate of 1 lb per 1000 sq ft (per label recommendation). Eight days after treatment, Deadline MPs was the most effective with 75% mortality, followed by Sluggo and Mesurol Pro with 49% and 36% mortality, respectively. Mesurol Pro is a restricted use pesticide.

**NEW MITICIDES** The following are new and re-registered:

**Akari** (fenpyroximate, Sepro) is considered by EPA as a reduced risk pesticide; however, it is registered for greenhouse use only. It is effective mainly against larvae, nymph and adults of spider mites. It gives fast knockdown within one day after treatment and provides 21 to 28 day of residual control. The REI (Re-entry interval) is 12 hours.

**Cinnamite** (synthetic cinnamon oil, Mycotech) controls aphids, mites and powdery mildew. It has a very broad label from herbs/spices to trees and an REI of 4 hours. The label does not recommend use on orchids, however, when tested in Hawai'i at the recommended rate, Cinnamite was found to be non-phytotoxic on certain cymbidium and dendrobium orchids (3 cultivars) under greenhouse/shade house

conditions and moderate weather conditions. The effectiveness is dependent on prolonged wetness of application.

Daniel Gilrein, Entomologist, Cornell Univ. reported "... generally poor results with Cinnamite in indoor trials on mini-roses for two-spotted mite control, plus some injury on these plants." He also "treated impatiens without obvious damage and did see some reasonably good aphid control."

NOTE: Prior to large-scale application, treat a few plants and observe for phytotoxicity over 4 weeks.

**Floramite** (bifenazate, Uniroyal) is considered by EPA to be a reduced risk pesticide with an REI of 12 hours. It has demonstrated effectiveness against spider mites and citrus red mite, and has a residual activity of up to 21 days.

**Hexygon** (hexythiazox, Gowan) is primarily effective against eggs and early mite stages. The eggs laid by treated adult females will not be fertile. It is particularly useful for spider mites and has an REI of 12 hours.

**Ovation** (clofentezine, Scotts) is fast-acting on spider mite eggs and early stages. It is safe to beneficial, insects, bees & predatory mites. It is slow-acting to non-effective against adult mites and has a 12 hr. REI.

**Vendex** (fenbutatin-oxide, Griffin) (Restricted Use Pesticide) is a re-registered miticide that is highly effective against spider mites. It can be used on greenhouse and outdoor ornamentals and established landscape ornamentals. Its mode of action is contact and it has no ovicidal activity. Mites are paralyzed prior to death and sometimes take 2-3 days to die. The REI is 48 hours.

Miticides Against Citrus Red Mite on Anthurium:

These miticides were tested on anthuriums against citrus red mite with the following results:

- \* **Cinnamite** was effective for 7 days.
- \* **Floramite** and **Avid** (abamectin, Syngenta) were effective for 28 days.
- **Conserve** (spinosad, Dow AgroSciences) was not effective as a miticide.

## NEW INSECTICIDES

**Marathon II** (imidacloprid, Olympic) is a new formulation that allows foliar application. Previously, **Marathon** was only available as granules or as a wettable powder for drench application. **Marathon** is a neonicotinoid, a new chemical class, and is NOT effective against mites. **Marathon** is highly effective against aphids, Chinese rose beetle, azalea lacebug, soft scales, and whiteflies. It is moderately effective against mealybugs. **Marathon** is a systemic insecticide that gives good residual control when taken up by the roots. The systemic uptake of **Marathon** in orchids, which are epiphytes (air plants) and may not absorb significant amounts of nutrients or pesticides through their roots, has not been documented; however, direct foliar application of **Marathon II** should be effective against whiteflies and aphids. Note: Merit (imidacloprid, Olympic) uses the same active ingredient as Marathon; however, it is registered for use on ornamentals in a landscape and not for plants in commercial greenhouses, nurseries, or on sod farms.

## Chlorpyrifos against Ants and Mealybugs

**Dursban 50 WP** (Chlorpyrifos, Dow AgroSciences) and **Duraguard** (Chlorpyrifos, Whitmire Micro-Gen), organophosphates, and an insect growth regulator in the carbamate class **Precision** (fenoxycarb, Syngenta), were tested against ants and mealybugs in red ginger flowers. After one application **Duraguard**, which is microencapsulated, was the most effective, followed by **Dursban 50 WP**. **Duraguard** was effective for more than 35 days. Both Dursban and Duraguard are now Restricted Use Pesticides. **Precision** was not effective against ants and mealybugs.

## Control of Western Flower Thrips (WFT)

These insecticides were recommended by Dr. Richard Lindquist, Ohio State University, for well-established thrip populations (Greenhouse Product News, March 2000):

\***Orthene 97 TT&O** (acephate, Valent) (8 oz/100 gallons) If necessary, repeat the application in two weeks.

\***Avid 0.15 EC** (abamectin, Syngenta) (8 oz/100 gallons) Tank mixing with Azatin XL (12 to 16 oz/100 gallons) or horticultural oil (Ultrafine 0.5-1%) may improve thrips control. Make a second application in 5 to 7 days.

\***Thiodan 50 WP** (endosulfan, FMC) (1 lb/100 gallon) Mix with a **pyrethroid** (i.e., Decathlon, Talstar or Tame). Make a second application after 5 to 7 days.

\***Mesuro 75 WP** (methiocarb, Gowan) (8 to 16 oz/acre) Repeat application in 5 to 7 days.

\***Conserve SC** (spinosad, Dow AgroSciences) (6 oz/100 gallons) Repeat application in 5 to 7 days. Make 2 to 3 applications. Activity is very rapid, but residual activity is short lived.

## Use of Synergist to Increase Effectiveness of Insecticides

**Incite** (Piperonyl butoxide (PBO), Loveland Industries) is a synergist that prevents insects from detoxifying chemical insecticides, especially pyrethroids (**Mavrik, Decathlon, Scimitar, Talstar, Tame**). Our research has documented increased effectiveness of **Mavrik** when mixed with PBO against the western flower thrips on orchids. PBO is also effective with other classes of insecticides (organophosphates, carbamates). While the use of synergists such as PBO may aid in preventing resistance to insecticides, it is only part of a complete pesticide resistance management program.

**Distance Insect Growth Regulator (IGR)** (pyriproxyfen, Valent) is a reduced risk pesticide that gives good control of whiteflies and armored scales. **Distance** also controls fungus gnats, shore flies and suppresses aphids. **Distance** directly inhibits egg, larval development and adult reproduction, thus breaking the life cycle of target pests. **Distance** also exhibits translaminar movement in plant leaves, providing insect control and suppression of egg hatch on both upper and lower surfaces of sprayed leaves. Recent trials on an armored scale on protea demonstrated that **Distance**, as with other IGR, was slow-acting but provided long term control of armored scales. **Marathon** (imidacloprid, Olympic), on the other hand, provided immediate mortality of armored scales but had no long-term residual control. Another field trial in Hawaii demonstrated that **Distance** was highly effective against spiraling whitefly infesting plumeria trees; significant reductions in adult and nymphal whiteflies were observed four weeks after application.

## Pylon is Now Available

**Pylon** (chlorfenapyr, Olympic) is a new insecticide in the pyrrole class. **Pylon** has a unique mode of action causing the insect to die from the inability to generate its own energy. **Pylon** is highly effective against broad mite, cyclamen mite, rust mite, spider mites and thrips, including western flower thrips and *Thrips palmi*. **Pylon** is not systemic and does not translocate throughout the plant; however, **Pylon** is translaminar and moves rapidly to control mites on both upper and lower surfaces of sprayed leaves. **Pylon** is quickly diluted in young, growing foliage as compared to its concentration at the time of application. For this reason, under high mite or thrips pressure, it is important to make two consecutive applications of **Pylon** within 5 to 7 days. Phytotoxicity tests conducted in Hawaii showed no plant damage to anthuriums and dendrobium orchids. Presently **Pylon** is labeled for **greenhouse use only**.

## Hot Water Kills Caribbean Tree Frogs

Caribbean tree frogs were first noted in Hawaii as early as 1988 and are now firmly established on the Big Island and Maui. One species, the coqui frog, has an extremely loud call that is a noise nuisance at night. In collaboration with the University of Hawaii at Hilo, and Hawaii Dept. of Land and Natural Resources, Division of Forestry and Wildlife, a hot water drench treatment has been developed to disinfest forest seedlings prior to planting. Hot water drench at 113° F (45° C) for 3 minutes killed frogs placed in media of seedlings. The Division of Forestry & Wildlife has designed and built a hot water drench system to mass treat seedlings prior to planting in re-forestation areas on the Big Island. “It’s the DOSE that KILLS!”

Paracelsus (1493-1541), a Swiss-born physician stated, “The right dose differentiates a poison and a remedy.” The toxicity of any chemical to an organism is related to the amount of exposure. Some compounds considered safe for human consumption can be used at higher doses to control pests. Garlic and salt are both common food seasonings, but at high doses they can be used to kill slugs. **Ecoguard** (ECOSpray Ltd) is a garlic-based pesticide developed in the United Kingdom with encouraging results from southern Spain for slug and whitefly control in greenhouse crops. Caffeine, at a higher dose than found in coffee, will kill frogs.

## PRECAUTIONARY STATEMENT

**Consult a chemical sales representative, the Hawaii Department of Agriculture, or the University of Hawaii Cooperative Extension Service or the United States Department of Agriculture for correct formulation of insecticides, more information, or updated recommendations.** The user is responsible for the proper use, application, storage, and disposal of pesticides.

## DISCLAIMER

Reference to a product does not imply approval or recommendation by the College of Tropical Agriculture and Human Resources, Cooperative Extension Service, University of Hawaii, or the United States Department of Agriculture and does not imply its approval to the exclusion of other products that may be suitable. All materials should be used in accordance with label instructions.

For questions, comments and more information contact Arnold Hara at the University of Hawaii, CTAHR, Beaumont Agricultural Research Center, 461 West Lanikaula St., Hilo, Hawaii 96720. Ph: 974-4105, Fax: 974-4110 or e--mail: arnold@hawaii.edu.

# Blossom Midge Causing Problems on Oahu

The Blossom Midge (*Contarinia maculipennis* Westwood), also known as the Hibiscus Bud Midge, is often a problem in the warm dry summers. This year it attacked flower growers early. **Look out** - its population seems to explode overnight. Although it is the first time some growers have encountered this pest, it has been around for a long, long time. It was first reported in Hawaii by Dr. Swezey in 1906 and is thought to have originated in Asia.

This tiny fly attacks orchids – particularly dendrobiums – pikake, plumeria, hibiscus, paukenikenikeni as well as tomatoes, eggplant and a wide range of other crops. Their larval feeding causes deformed and discolored flower buds and blossoms. When attacked at an early stage, the buds will abort, turn a yellowish color and fall off.

The adult fly is about 1/25” long (less than the thickness of a dime) and lays from 5 to 30 eggs in the developing buds. Its longish legs give it a mosquito-like appearance. After the eggs hatch, the larvae stage feeds on and damages the buds. Once they mature, they jump from the buds to the ground and burrow into the soil. Their tendency to jump or flip is a distinctive characteristic. After the larvae pupate in the soil the adult emerges – usually in the early evening.

There are several ways to know whether or not you have this pest in your nursery or farm. First, there is the damage to the flowers and buds. You may see some of the tiny adults flying around. Cut apart some flowers showing distortion and try to find the miniscule larvae that jump and flip away. They are difficult to see unless you have excellent vision or a hand lens. Finally, set up some yellow sticky cards to catch the adults. After 24 hours count the number of adults you catch. You can use that piece of information to decide whether or not to apply an insecticide, and to determine its effectiveness.

Because most stages are hidden in the buds or in the soil they cannot be controlled with contact

foliar insecticides. And since systemic insecticides are not readily translocated to flower buds, they do not offer a good control of the larvae.

**Removing and destroying infested buds is the most important management practice for midge control.** Although it is not easy, bagging and completely removing buds from the field is a necessity.

Only the adult stage of the blossom midge is susceptible to contact insecticides; however, they survive only 4 days. Treating the ground with insecticides targets the pupal stage. If there is good news, it is that the adults seem to be susceptible to a broad range of contact insecticides.

Decathlon/Topcide, Dursban, Diazinon and Malathion can be used to control both the adult as well as treat the soil surface. Dursban and Diazinon are now restricted use chemicals and require a license. Avid has translaminar activity and is able to penetrate the buds to attack the larvae. Dimethoate is systemic, but is probably not translocated enough to the bud to control the larvae. It can also be phytotoxic to orchids and other flowers.

Orthene has been the old standby used for many years for blossom midge control. However, rotating chemicals from different classes with different modes of action is crucial for avoiding insect resistance to a particular chemical.

An experiment conducted in Thailand using several insecticides no longer available in the U.S. found that neem extract resulted in 62% larvae mortality. Although there has been no test of effectiveness for other insecticides, a number of them have been suggested including: Azadirachtin, Azatin, Bacillus Thuringiensis, Gnatrol, Cyromazine, Citation, Esfenvalerate, Fulvalinate Fenoxycarb, Kinoprene, Enstar,

Petroleum Oil, Pyrethrum, Pyrenone, and Resmethrin.

Weekly insecticidal applications have been recommended. Since the adult only survives 4 days, a more frequent rate might be necessary when an infestation has gotten out of control. However, applying pesticides while leaving infested buds and flowers in the field is like –

- electing politicians based on what they say.
- swatting flies with a wet noodle and the window open.
- nailing Jello to a tree.
- tying up your dog, while letting your 16 year old son run wild.
- driving 90 miles an hour on slick pavement to make up for lost time.
- trying to make more money than your wife can spend. Okay, I got carried away, but you get the idea.

Now that you have used yellow sticky cards to determine the size of the midge population, you can use that information again. After making an insecticide application, wait a day then place a new yellow sticky card in the field. Wait another 24 hours and count the number of adult blossom midges on the card to get an idea the effectiveness of your insecticide application. Keep a track of the numbers you count and your management efforts in a log. Don't forget that not all insecticides give immediate knock down. Also keep in mind that the blossom midge may be migrating in from outside areas. However, keeping tabs on the adult population gives you a basis to plan your control strategy. Remember knowledge is power.

For pictures and more information on the blossom midge see: <http://www.ifas.ufl.edu/~apkwweb/pestalrt/midgefin1.htm>

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If it weren't for the last minute, a lot of things wouldn't get done.

- Michael S. Traylor

Dimethoate Cancellation Order Published

On March 13, 2002, EPA published in the Federal Register a cancellation order and label amendments for dimethoate end-use products, removing all residential and certain agricultural uses. This order follows the requests from registrants for voluntary cancellation and amendment of their dimethoate registrations to terminate all indoor uses, certain agricultural uses, and certain outdoor non- agricultural uses. No comments were received during a public comment period. EPA approved the requested voluntary cancellations and use amendments effective March 13, 2002.

Registrants may distribute or sell dimethoate products with residential, public area, and agricultural housefly uses only until March 12, 2003. Others may continue to sell, distribute, and use these products until existing stocks are exhausted. Most of the cancellations in agricultural use relate to animal operations. But they also include applications around structures and in buildings for fly and other pest control.

The dimethoate FR notices are available on EPA's website at <http://www.epa.gov/EPA-PEST/2002/March/Day-13/p6090.htm>. Additional information about dimethoate is available at: <http://www.epa.gov/pesticides/op/dimethoate.htm>

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### Bumper Stickers for Women

- So many men, so few who can afford me.
- God made us sisters, prozac made us friends.
- If they don't have chocolate in heaven, I ain't going.
- My mother is a travel agent for guilt trips.
- Princess, having had sufficient experience with prince, seeks frog.
- Coffee, chocolate, men ... some things are just better rich.

## When is a Soap Not a Soap?

There are a number of insecticidal “soap” products on the market. The use of the word “soap” indicates a product is a fatty acid salt. Perhaps “soap” was used to give the feeling that the product is safe to use. Of course, we wash ourselves, dishes and practically everything else with soaps – how could it not be safe? And in reality they are practically nontoxic compared to other chemical insecticides.

But the same is not true for plants. Insecticidal soap products have been designed for killing insects. They have been tested on a variety of plants and measurements have been made as to the dose that can be used without phyto-toxic results. Laundry and dish soaps have been designed for cleaning. By using them to control insects you risk destroying your crop.

You can buy some “soap” products that are herbicides. The only difference between an insecticide and a herbicide is the number of carbon molecules in the fatty acid chains. The nine carbon chains of the herbicides give them the ability to kill all green plants.

Laundry and dish soap manufacturers are not required to disclose the type of soap in their products. They admit that they don’t intend their products to be used as pesticides, and they haven’t been registered by EPA. Don’t risk your crop by spraying it with a soap not labeled for plant use. Use only soaps registered as insecticides to be safe.

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A husband and wife drove for miles in silence after a terrible argument in which neither would budge. The husband pointed to a mule in a pasture.

"Relative of yours?" he asked.

"Yes," she replied. "By marriage."

-Bobbie Mae Cooley in
American Legion Magazine

“Ka Lono Pua” Goes Electronic

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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.

Mahalo!

Edwin F. Mersino
County Extension Agent
Agriculture Program

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"So you want another day off," snorted the office manager to his clerk. "I'm anxious to hear what excuse you have this time. You've been off for your grandfather's funeral four times already."

Replied the clerk, "Today my grandma is getting married again."

-Joe Lanser in Elkhorn, Wis., *Independent*

- What are the newest ornamental insecticides and miticides?
- Can being environmentally conscious pay off?
- When is a soap not a soap?
- Are midges causing the flower distortions and bud abortion in your crop?
- What is being done to make insect resistant plants?

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