May 2003

Note: Some of the information provided on products/pesticide use below, is from other states and thus the products may have no current Hawaii registration. Always read the label before making any product/pesticide applications. Due to environmental effects the effectiveness of particular products may also vary across locations. Also note that recommendations developed for northern climates may not be directly applicable to Hawaii.

Index
1.0 Organic Market Report on the WEB;
2.0 Mucuna use in Central America;
3.0 Thionex reg on Macadamia and pineapple;
4.0 NRCS Farm loan updates;
5.0 Loss of Exothermil in Greenhouse tomatoes (Mass);
6.0 Herbicides updates for 2003 (Mass);
7.0 Mite Control in Strawberries (N. Carolina);
8.0 Notes on Cabrio Fungicide use in Strawberry (NCS);
9.0 Courier for whitefly control (Florida);
10.0 Vitamin A Benefits, USDA research;
11.0 Sandea Herbicide use tips;
12.0 Sandea for nutsedge control;
13.0 Fruit Corner: Bananas in Verge of Extinction?;
14.0 Rural energy grants available;
15.0 New Insights on the Double Helix;
16.0 PestNet Network for Pacific Region on WEB;
17.0 Upcoming National meetings.
1.0 Organic Market Report on the WEB

RODALE INSTITUTE INITIATES ORGANIC MARKET REPORT

Organic farming has come of age. Now organic growers can log onto the web and find out what organic produce is selling for on the west and east coasts. This new service initiated by longtime organic proponents at the Rodale Institute, pinpoints weekly prices for organic foods gathered through a comparison of terminal market, wholesale and selected large-scale retail prices. Though comprehensive info is not available on this still emerging market, the index is designed to use the best available data. It lists wholesale prices for certified organic fresh produce and grains, as well as emerging prices for certified organic dairy and self-identified sustainably raised meats. Wether you are an organic farmer wanting to stay up on prices, a conventional farmer looking to switch over, or a consumer who wants to compare organic with conventional prices, this website is a joy.
See at: http://www.newfarm.org/opx/index.shtml
(Rural Updates! April 2, 2003)

2.0 Mucuna use in Central America

[Editor's note: Mucuna is a leguminous plant used in many parts of the world as a cover crop, and as an intercrop in small-scale farming systems. Once it is established Mucuna does an excellent job in protecting the ground from soil erosion, especially in sloped areas. As a legume and fast growing crop this plant also contributes significant amounts of biomass, weed protection, and Nitrogen to the system, increasing the yields of companion or follow-up crops. One of the main advantages of mucuna, which partly explains its widespread adoption in several continents is that it is resistant to several important nematode species, such as root-knot nematodes.]
Below is an update on mucuna use in Mesoamerica, provided by long-time agroecologist Rolando Bunch.]

We are now tabulating the results of our study of the extent of mucuna use in Mesoamerica (Honduras, Guatemala, and Mexico), being done by Ami Kadar. Some of the information is pretty much what we expected, but some of it is quite interesting.

In general, we have found that the system is alive and well, in all three countries. In Honduras, it is losing ground to oil palms and cattle, though thousands of farmers still use it. Interestingly enough, it is still apparently spreading south into the Department of Gracias.

In Guatemala, it is apparently holding its own in the Polochic Valley, but spreading fairly rapidly through the Peten. And in Mexico, it is spreading in a few isolated areas, in Tabasco and Veracruz States. Actually, we were surprised to find a few farmers using it clear up in the northern reaches of Veracruz State.

The most interesting result of the study is that there are a good eight distinct systems in which mucuna is associated with maize, and these systems do seem to vary according to climatic conditions, to some extent. Of course, it was a little difficult to define exactly how we would count the systems (we could have had about 20 systems if we'd been more focused on the differences in planting dates, for instance). What we did to differentiate systems was to say that, for one system to be considered different from another system, either the maize or the mucuna had to be planted in a different season altogether. For this purpose, we counted three seasons--the early "primera" season, from May to August; the late "postrera" season, from September to November; and the "drier" season, from December to April. Here is the run-down of systems (if any of you can think of some more inspiring names for some of these, let us know):

1. The "Drier Season" System. Here the maize and mucuna are both planted in December-January, and the mucuna grows until the following December. This is the dominant system on the North
Coast of Honduras, the Polochic Valley, and much of Caribbean Mexico.

2. The "Chahuitera" System. In this case, the planting dates are the same, but the purpose and location of the system is very different. In drier areas (e.g., the western part of the Tehuantepec Peninsula), this system is used alongside rivers. Maize is planted using the receding moisture, and the mucuna is largely planted with the purpose of a green mulch—to maintain as much as possible the moisture in the soil.

3. The "Double Maize" System (this name CRIES for a better moniker!). In this case, maize is planted in both December and May, together with mucuna. Interestingly enough, this system exists in small pockets in all three countries, in the highest reaches of the mountains along the Honduran coast, near Malpaso in Chiapas, and in Chixoy and parts of the Peten in Guatemala. This System should be of particular interest to development institutions, because in some areas (notably the North Coast of Honduras), the mucuna system is losing ground because it is not "intensive" enough—presumably cannot produce two harvests of maize in the same year. The presence of this system in one place after another would seem to solve that limitation.

4. The "First Season" System. This system consists simply of planting both the maize and mucuna in May-June, when the rains start.

5. The The "Traditional Green Manure" System. Here, just as green manures have been managed in the temperate climates traditionally, the mucuna is planted in the first season, then cut down in time for the maize planting in the second season (sometimes as late as November).

6. The "Second Season" System. Both the maize and mucuna are planted in October. Interestingly enough, farmers who practice this system usually practice the First Season System on another piece of land. That is, they have one maize/mucuna system that produces maize in October, and another, on another nearby field, that
produces maize in about January. That way, they never have to store maize more than about seven months.

7. The "Omoa" System. Apparently only used around Omoa in northern Honduras, this system consists of planting maize and mucuna in May-June, and then cutting everything down, so a second crop of maize is injection-planted through the dead mulch in September-October.

8. The "Improved Fallow System". Used both in Cerro San Gil, Guatemala, and in Mexico, this system is basically an improved fallow or rotational system: the mucuna is planted in May, allowed to grow one to two years, and then the maize is planted the following May-June, for a year or two.

(In the last memo, I meant the TOWN of Gracias, in the Lempira Department, rather than the Department of Gracias, which doesn't exist. Although the capital of the Department of Gracias A Dios, to confuse things totally, is called Puerto Lempira.)

(Roland Bunch, e-mail, April 15, 2003).

3.0 Thionex reg on Macadamia and pineapple

HI Dept. of Ag. Pesticides Branch issued 24(c) registrations for Macadamia and for Pineapple.

A summary follows. If you want a scanned image of the labeling + the cover letter, send me a request.

SUMMARY

For growers of Macadamia nuts—use of the pesticide Thionex 50W (Makhteshim-Agan of North America, Inc.; EPA Reg. No. 66222-62)—requires having a copy of HI-030001, valid 3/12/03 –3/11/08—some notes:

• Applications should be made as a directed spray to foliage.
• Do not use more than 6 pounds per acre per year.
• Do not apply by air.
• Do not apply within 2 days of harvest.
• Do not graze livestock on orchard crops or grasses in treated areas.
• Chemigation prohibited.
• The area being treated must be vacated by unprotected persons.
• This is a restricted use pesticide.
• This is an agricultural pesticide and so the Worker Protection Standard applies.

For growers of pineapple—use of the pesticide Thionex 3EC (Makhteshim-Agan of North America, Inc.; EPA Reg. No. 66222-63)—requires having a copy of HI-030002, valid 3/12/03 –3/11/08—some notes:
• Do not apply within 60 days of harvest.
• Do not make more than 2 applications per year.
• Do not exceed a maximum of 1.5 lb. of active ingredient per application. Do not make more than two applications per crop year.
• Do not exceed a maximum or 3.0 lb. of active ingredient (4 qt.) per acre per crop year.
• Do not enter treated areas without protective clothing for 24 hours. • Do not apply directly to water or to areas where surface water is present. Do not apply within a distance of 300 feet of lakes, ponds, streams, or estuaries.
• This is a restricted use pesticide.
• This is an agricultural pesticide and so the Worker Protection Standard applies.

Pesticide Risk Reduction Education Program
Plant & Environmental Protection Sciences Dept.
3050 Maile Way, Gilmore 310, Honolulu, HI 96822
Ph. 808-956-6007, Fax 808-956-9675
(Charles Nagamine, e-mail April 1, 2003).

4.0 NRCS Farm loan updates

Farm Loan Program

Objective
The objective of the Farm Service Agency's (FSA) direct operating loan and farm ownership program is to help existing and beginning farmers successfully establish themselves in financially viable, family-sized farming operations. Farmers may use FSA financing only when commercial credit is unavailable to them at reasonable rates and terms. FSA also provides credit counseling and oversight to its farm loan customers.

Who Can Qualify

Loan applicants must meet certain eligibility requirements, demonstrate the ability to repay the loan, and be able to provide collateral to secure the loan.

Key Eligibility Requirements Include:

- Must be unable to obtain the needed credit from a commercial lender at reasonable rates and terms considering all assets and income owned by the applicant. FSA may require applicants to apply for a commercial loan at a private lending institution if it appears they might qualify.

- Must have training and education, or, recent and relevant on-the-job experience managing and operating a farm (the equivalent of 1 year's complete production and marketing cycle within the last 5 years) to demonstrate to FSA that he or she has the basic financial, production, and management skills to successfully carry out the agricultural enterprise.

- Must not be delinquent on any U.S. Federal debt.

- Must not have previous loss with FSA.

- Must have an acceptable credit history.

- For Farm Ownership Loans:

- Must have actively participated in farming or ranching activities for at least three years.
Current Interest Rates: Farm Ownership 5.5%  
Operating Loan 3.5%

For further information, contact the Farm Loan Division at (808) 933-8343.

5.0 Loss of Exothermil in Greenhouse tomatoes (Mass)

LOSS OF EXOTHERM TERMIL IN GREENHOUSE TOMATOES FORCES GROWERS TO MAKE NEW DECISIONS

Robert Wick and John Howell

The most important fungal diseases of greenhouse tomatoes are Leaf mold (Fulvia fulva), Botrytis blight (Botrytis cinerea), and Powdery mildew (Erysiphe). Any one of these diseases can be very destructive when environmental conditions are favorable for disease. The compelling reason for writing this article is that we have recently lost the fungicide Exotherm Termil (chlorothalonil) as a management tool for controlling these diseases. Tomato was taken off of the Exotherm Termil label because a new ingredient was added to the fungicide, and it does not have clearance on vegetables. Also, an additional ignitor chemical was added which does not have clearance to be used on plants to be consumed as food. Do not use this new formulation of Exotherm Termil on greenhouse tomatoes or other food crops.

Leaf Mold: This disease is caused by the fungus Fulvia fulva; in older literature it was called Cladosporium fulva. It is common on greenhouse tomatoes and uncommon on field grown tomatoes. The pathogen is restricted to tomato. The disease is first apparent as pale yellow spots randomly scattered on the surface of the leaves. Older leaves are affected first. The underside of the leaf, opposite the yellow spots, reveals a greenish felty crop of spores. Affected leaves generally dry up and die. Relative humidity above 85% and temperatures between 70 and 75 degrees Fahrenheit are ideal for
disease development. Personnel moving through the greenhouse and working with plants easily dislodges spores and spreads the pathogen. Typically, the crop is uniformly affected in a relatively short period of time. After an episode with leaf mold, remove all tomato debris from the greenhouse. Consider steaming the soil and disinfecting all surfaces. The fungicide Manex (maneb, an EBDC) is registered for this disease on greenhouse tomatoes, however, this material is thought to increase susceptibility to Botrytis (see Botrytis information).

If your greenhouse has a history of leaf mold, consider growing resistant cultivars. Try several below representing resistance to different Fulvia strains:

FULVIA RESISTANT TOMATO CULTIVARS
CULTIVAR        FULVIA STRAIN
Buffalo               C5
Capello               C5
Caruso                C5
Cobra                 C5
Dombito             C1, C2
Junbo                 C1, C2
Laura                 C2
Vision I              C5

Botrytis Blight: Botrytis blight, or Gray mold, is caused by the fungus Botrytis cinerea. It is a common greenhouse inhabitant and has a very wide host range. Most growers recognize this disease by the fuzzy, gray crop of spores that develops on lesions. Generally, the fungus attacks old or young tissues and not usually healthy vigorous growth. However, on tomatoes it is common at pruning wounds, older foliage and occasionally at the calyx end of the fruit. It can also cause “ghost spot” of the fruit, a condition where spores infect the fruit but disease is stopped. Temperatures from 65 to 75 degrees Fahrenheit are ideal for disease but humidity above 91% is also necessary. Horticultural oils applied during cool, humid weather, and EBDC fungicides are thought to increase susceptibility to Botrytis.
Managing humidity and reducing leaf wetness is critical to controlling Botrytis (see Controlling relative humidity section). Currently, Armicarb 100 (potassium bicarbonate) is the only fungicide registered for greenhouse tomatoes but it may not be effective for this disease. At an on-line publication http://www.nysipm.cornell.edu/publications/greymold.html listed Armicard as a product that increased leaf disease. The same publication reported that Mycostop S drenched into the soil significantly decreased leaf disease. Mycostop is primarily for root diseases, and no claims for Botrytis management occur on the label.

Powdery Mildew: Powdery mildew is a relatively new disease of tomato in the Northeastern US. The disease occurs in other parts of the country but the powdery mildew pathogen is not the same. Researchers at the Connecticut Agricultural Experiment Station have identified Oidium lycopersicum as the cause of powdery mildew in Massachusetts and Connecticut. The disease can be moderate to very destructive. Research carried out at the CAES http://www.hort.uconn.edu/ipm/veg/htms/pmildton.html indicated that Quadris and Kocide reduced powdery mildew on leaves but did not significantly increase yield. The Quadris label does not specifically mention greenhouse use. Armicard (potassium bicarbonate) is registered for powdery mildew on greenhouse tomatoes.

Controlling relative humidity: The only practical way to control RH in a greenhouse is by ventilating to exhaust warm, humid air and replace it with cooler air with less moisture. Warm air holds more moisture than cool air. In fact, for every 20 degrees Fahrenheit increase in temperature, the moisture holding capacity of air nearly doubles. During warm day temperatures, the air contains more moisture than during the cooler evening temperatures. At 75 degrees Fahrenheit, and 100% RH a cubic meter of air holds about 20 grams of water vapor, but at 65 degrees Fahrenheit it can hold only about 15 grams. As air-cools, its ability to hold moisture is reduced and the RH goes up. During the day, a temperature of 75 degrees Fahrenheit and 90%, RH are typical. As the temperature cools in the evening the air becomes saturated (100% RH) at about 72 degrees Fahrenheit. As air-cools further to a typical night temperature of 65 degrees Fahrenheit, water condenses on surfaces
including pipes, plastic and plant leaves. To avoid this, RH should be reduced before or while the air is cooled to the night temperature. Exhausting the moist warm air and replacing it with cooler outside air that has less water vapor can reduce humidity. Activate the exhaust fans for a short period, and then heat the greenhouse to raise temperature to the desired nighttime level. This may have to be repeated. While the exhaust fans are running, the furnace must not come on or else flue gases can be drawn back into the greenhouse. You can simply turn the furnaces off while venting or install a lockout relay to prevent the heat from coming on until the exhaust fans shut off. With a lockout device, you can use timers to automatically vent and heat during the night. Set the timers so that the exhaust fans come on for 20 to 30 seconds, two to three times per hour if needed. This seems like a waste of fuel and money, but very little fuel is used to reheat the air. High relative humidity can lead to devastating disease loss which is much more expensive.

Using horizontal air flow (HAF) can also reduce condensation. HAF fans keep air moving in the greenhouse, helping to minimize temperature differentials and cold spots where condensation occurs. Air that is moving is continually mixed and this reduces condensation on plant surfaces. HAF should be used in addition to proper ventilation, not in place of it.


6.0 Herbicides updates for 2003 (Mass)
Bladex 4L(cyanazine) in Sweet Corn: The label, as well as the food tolerance for this product, have now expired as of December 31, 2002. This expiration also includes CyPro, a dry premix of atrazine and Bladex.

Sweet Corn Registrations: Prior writings have discussed two herbicides recently registered for sweet corn. These include Permit 75WSG (halosulfuron) and Prowl 3.3 EC (pendimethalin). In brief, Permit can be used for postemergence control of yellow nutsedge, velvetleaf, common ragweed, and many other problem weeds in sweet corn. Prowl, is applied to the soil surface after seeding and will provide good to excellent activity on triazine-resistant lambsquarters and velvetleaf. Each of these products has very specific instructions that must be followed to avoid crop injury. Both products were extensively used during 2002 and results were favorable.

2,4-D Formulation Change: Amine 4 is the new formulation of 2,4-D amine (salt) available for use in asparagus, sweet corn, and strawberry. Formula 40 will no longer be available. There are many ester and low-volatile ester formulations on the market for other uses of 2,4-D. Be certain to NEVER use ester or low-volatile ester formulation of 2,4-D on vegetable or fruit crops. Both ester and low-volatile ester formulations of 2,4-D can move from the target area after application under warm weather or low humidity conditions. They have the potential to damage crops far from the site of application and their movement is unpredictable.

Gramoxone (paraquat) Formulation Change: Gramoxone Max 3S has replaced Gramoxone Extra for all uses. Label rates are generally lower than the old formulation since Gramoxone Max contains more active ingredient per gallon. As with the old formulation, the use of a non-ionic surfactant is still required. With Gramoxone, always remember that better weed coverage through the use of more water per acre will result in better weed kill.
Dacthal 75WP (DCPA): Dacthal herbicide was back on the market during 2002 with all the previous labeling. The price of this product has more than doubled, however, rising to approximately $14 per pound. Critical uses of this product are on newly transplanted strawberry and on direct-seeded onions. Because of the expense of this product, it will not be commonly used. Check the 2002-2003 New England Vegetable Management Guide for suggestions on possible replacements for Dacthal in other crops.

Strategy (ethalfluralin + clomazone): This label came out during 2002 and the product was extensively throughout New England. Strategy is a premix of Curbit (ethalfluralin) and Command (clomazone). It is intended for preemergence control of annual grasses and many broadleaf weeds in cucumber, melon, pumpkin, summer squash, winter squash, and watermelon. Broadleaf weeds controlled include, common lambsquarters, pigweed, common purslane, velvetleaf, common ragweed, and Pennsylvania smartweed. This product may be applied to the soil surface after direct seeding on bare ground. It may also be banded between plastic for both direct-seeded and transplanted crops. The formulation of Command contained in this product is the ME (microencapsulated) formulation which does not need to be incorporated. There are many precautions on the label including some replant precautions. For squash and pumpkin, this product will be the treatment of choice since it controls so many weed species. In cucumber and melon, however, Curbit tank-mixed with Alanap (naptalam) may still be a good option since most of the same weeds are controlled but the carryover concerns with clomazone are not present.

Sandea 75WSG (halosulfuron): The new label covers cucurbits, tomatoes, fruiting vegetables, asparagus, dry beans, and snap & lima beans. Sandea provides preemergence and postemergence control of many weeds; however, common lambsquarters is controlled best by a preemergence application while yellow nutsedge is controlled best by a postemergence application. Postemergence applications require the use a non-ionic surfactant at a rate of 1 quart per 100 gallons spray mix. Heavy rains following preemergence applications can lead to severe crop injury. There is the potential for crop
stunting and a slight maturity delay with the use of Sandea over the top of the crop. Growers should limit their use of Sandea initially to gain experience. Use the correct amount of product per acre. The most common use rate will be 1/2 ounce per acre. If the directions are not followed, the potential for severe crop injury does exist. A brief summary of use directions follows. Consult the label for complete directions. Consider using Sandea only if current management strategies are not working or as a supplement to existing management strategies to control certain problem weeds. This herbicide may carryover to the following year and can cause severe injury in crucifers, greens, spinach, beets, carrots, onions, and other crops. See the label for details.

Please read the label entirely regarding application directions and precautions. Accurate measurement and application is essential to minimize crop stunting and delay. A plastic measuring cup should be included with the herbicide container. Results during 2002 in Massachusetts on winter squash, cucumbers, and pumpkins were generally favorable although some severe injury did exist. Crop stunting was common but plants, in most cases, recovered with only a slight yield delay.

Cucumbers: Apply Sandea 75WSG preemergence after seeding and before crop emerges. Can also be applied when a seeded crop has 2-5 true leaves but the potential for crop stunting and yield delay should limit postemergence use to areas where weed pressure is high and yield reductions due to weeds would be unacceptable. Can also be used between plastic mulch with direct-seeded or transplanted cucumbers. In cucumbers, with a shorter life cycle that most other cucurbits, it might make sense to use this product preemergence alone or in addition to Strategy, or Curbit, or Alanap.

Pumpkins and Winter Squash: Apply Sandea 75WSG postemergence when the seeded crop has 2 to 5 true leaves. Crop injury and some delay may result. Can also be used preemergence after seeding; however excess rainfall or irrigation may cause unacceptable crop stunting. Can also be used between plastic mulch with direct-seeded or transplanted winter squash and pumpkins. Perhaps the best fit for this product in winter squash and pumpkins is for postemergence control after preemergence use of another product.
(Curbit, Strategy, Prefar, or Command). Sandea will provide postemergence control of yellow nutsedge, redroot pigweed, velvetleaf, common ragweed, and many other broadleaf weeds.

Summer Squash, Muskmelons, Watermelons: Apply Sandea 75WSG between rows of plastic mulch avoiding contact with the plastic and crop. May also be used in row middles without plastic; any crop contact or use in the crop row will cause injury.

Tomato: Apply Sandea 75WSG either over the top of transplanted tomatoes at least 14 days after transplanting, under plastic mulch, or in row middles. The greatest potential for crop injury occurs when the crop is contacted.

Pepper, Eggplant, Tomatillo: Apply Sandea 75WSG between rows of plastic mulch avoiding contact with the plastic and crop. May also be used in row middles without plastic; any crop contact or use in the crop row will cause injury. If a shielded sprayer is not available, consider applying Sandea to the row middles after the plastic is down but before the crop is transplanted.

Dry Beans, Lima Beans, Snap Beans: Apply Sandea 75WSG preemergence after seeding but before crop emerges. Use lower rates on lighter soils.

Asparagus: Sandea 75WSG may be used during the cutting season after a clear cut or after final harvest. If ferns are present, direct the application to the base of the ferns to avoid injury.

Sinbar 80 WP (terbacil): The supplemental label for strawberries has been revised to allow use during the transplant year as well as on soils with between 0.5% and 2% organic matter. During the planting year, Sinbar may be applied at 2 to 3 ounces per acre after transplanting but before new runners start to root. If strawberry plants have developed any new foliage prior to application, irrigation or rainfall (0.5 to 1 inch) is required to wash the Sinbar off the strawberry plants. In late summer or early fall, a second application may be applied at 2 to 6 ounces per acre to control winter annual weeds. This application must also be followed by 0.5 to 1 inch of irrigation or rainfall to wash the Sinbar off the plants. A
third application of 2 to 4 ounces per acre can be applied, as usual, after the strawberry plants are dormant and just prior to mulching.

For soils with at least 2% organic matter, there is no maximum amount per application; however, no more than 8 ounces of Sinbar can be applied per year. For soils with between 1 and 2% organic matter, a maximum of 4 ounces of Sinbar can be applied at any one time with an annual maximum of 8 ounces per acre. For soils with between 0.5 and 1% organic matter, a maximum of 3 ounces of Sinbar can be applied at any one time with an annual maximum of 6 ounces per acre.

Following the establishment year, applications can only be made just after renovation and just prior to mulching. Applications are now allowed, however, on soils with between 0.5% and 2% organic matter using the same guidelines for rates as above. As always, be careful with Sinbar in strawberries, especially with potential overlap of sprayer passes which will double the rate and increase the potential for injury in some varieties. Please consult the new supplemental label for addition information, rates, precautions, etc.

(Richard Bonanno, ed., UMASS EXTENSION, VEGETABLE NOTES, For Vegetable Farmers in Massachusetts, VOLUME 13, NUMBER 25, MARCH 2003)

7.0 Mite Control in Strawberries (N. Carolina)

[Editor's Note: the recommendations listed below are for strawberry growers in North Carolina. This article is provided for general information only; the recommendations may not be necessarily applicable to Hawaii]

Strawberry Plasticulture March 18, 2003 (no.2)
Vol. 4, No. 16 - Strawberry Mites and their Management

General: Since issuing an advisory on Strawberry Mites and Management in early March, Dr. Sorensen has supplied us with additional information about miticides and their application. But,
first a question: Have you scouted your crop for mites recently? As Dr. Sorensen said in March 3rd advisory, “Assume you have mites!”

Recap on sampling: From Dr. Sorensen’s March 3rd advisory, he said, “Check plants for mite stages using a 10X hand lens. You can also use a dissecting microscope. Remove the older leaves laying flat on the plastic. Do not examine new, unfolding leaves. You can mix the sample with old lower leaves and old leaves in the middle of the plant. Mites at this time have been confined to the older leaves contacting the black plastic around the base of the plant where temperatures are the highest.”

Threshold: As a rule 5% of the plants with mites means be prepared to spray. It is not necessary to count all the mites on a leaf, but rather just presence or absence of mites is sufficient. Be sure to record the number sampled with the date. You can take samples every week if you want to stay completely on top of mite development.

Weather effects: Why monitor the weather? Mites can pass through a complete cycle (adult to adult) in about 7 days at temperatures of 80 and 50 day / night. Warm weather, bright sun, low wind and no rain are favorable for mite development. The degree of favorable conditions and the duration will determine how fast mites will build up (I would expect that recent “rainforest” conditions have slowed them down - watch out for this weekend though, as we could be heading into lower 80s on Friday Mar 21 - first day of Spring. And, the weekend “should” be dry).

Miticide selection: As Dr. Sorensen said, “All miticides have their place and you must select the one that fits your situation at the time. Acramite is the new one with unique chemistry and has not been used - so resistance should not exist. It also is effective against all mite stages and has good residual activity. Try it and order early so your dealer has it on hand. Savey is another new miticide that has ovicide activity. It can only be used once a year. Then there is AgriMek, Kelthane, Vendex and etc. AgriMek label indicates two applications. Kelthane is an old miticide that still works when not over used. Vendex is a selective miticide but it is slow.” Here are some bullets that Ken just sent me yesterday (March 17):
- Savey for once over early to control mite eggs
- Acramite to control all mite stages and give good residual
- AgriMek with 2 applications for general mite control
- Danitol/Brigade for mites and other insects. A broad pest spectrum...good and bad

Selecting the “best” miticide is not an easy decision: As Dr. Sorensen said: “Several factors can influence your decision. Experience, availability, cost, formulation, safety to the applicator, safety to good mites and insects, safety to the environment, size of container, shelf life, time limitations to harvest, re-entry interval, compatibility with other sprays, pH of my water, class of miticide, mode of action, when used last in my field, resistance level of mites in my field etc. It is not easy and simple to select one. But you gather information, integrate that information and make the best choice at the time.”

Agri-Mek specimen label: http://www.cdms.net/ldat/ld27U007.pdf  
Bridage specimen label: http://www.cdms.net/ldat/ld318006.pdf  
Danitol specimen label: http://www.cdms.net/ldat/ld520005.pdf  
Savey specimen label: http://www.cdms.net/ldat/ld0IF016.pdf  
Acramite specimen label: http://www.cdms.net/ldat/ld4TA001.pdf

Agri-Mek Notes: With Agri-Mek you can make two applications per season. After you've applied, check in about 5 days with a hand lens to see how well the product has worked. With Agri-Mek, wait about 7-10 days from the first application before making the second treatment. Don’t make the second treatment 3-5 days after the first application...that is not long enough.

From Uniroyal Chemical "Best use recommendations for Acramite-50 WS"
Application timing: Apply Acramite-50WS to low mite populations for best control. Two applications per season: one spring, one summer/fall. Rotate with other miticides for resistance management. Apply to building mite populations before they reach damaging levels. Does not need to be absorbed into young leaf tissue. Does not need to be applied before mites appear.
Application method: Apply Acramite-50WS by ground only. Apply at 0.75 to 1.0 lb per acre. Use the higher rate for quicker knockdown of high or rapidly building populations, dense plant canopies, and longer residual control. Apply sufficient volume to obtain thorough coverage for contact activity. For optimum coverage of hard to wet foliage, and organosilicone adjuvant is recommended to be added to the Acramite 50WS/water solution. Minimum of 100 gallons spray volume per acre.

Precautions: Only 2 applications per year for resistance management. Maintain tank mix at pH 8 or lower (an easy way to test your pesticide spray solutions is with a Water pH meter - you may wish to contact Spectrum 800-248-8873 for information about their pH Pro Meter - there are a other sources of these meters and in future advisories I will try to add to this listing).

Other notes: According to Uniroyal Chemical, Acramite-50WS controls motile mites at application and those which hatch later. It provides high egg mortality of many spider mite species. It is IPM compatible with Persimilis and other predator beneficials. Acramite-50WS is unique Carbazate chemistry and quickly stops feeding by paralysis. It has a unique active ingredient with no cross resistance to other miticides. Acramite-50WS is an EPA Reduced Risk Miticide. Normal work attire personal protective equipment. Short 1 day pre-harvest interval and 12 hour restricted entry interval. No phytotoxicity has been observed.

Specimen labels: www.cdms.net

Our sincere thanks to Dr. Ken Sorensen, Professor, Entomology, NCSU, and to Dr. Roy Parker, Uniroyal Chemical (phone 803-808-7194), for their contributions to this advisory!

(Barclay Poling, ed., Strawberry Plasticulture March 18, 2003 (no.2) Vol. 4, No. 16 - Strawberry Mites and their Management)

8.0 Notes on Cabrio Fungicide use in Strawberry (NCS)

Cabrio update from BASF, Tom McKemie - BASF-Tech Service
The information below is extracted from a recent communication from Tom McKemie to Frank Louws and myself. We greatly appreciate Tom’s update and the information below will hopefully help to clear up any confusion on BASF’s recommendations for Cabrio on Strawberries.

-1. BASF is promoting the use of Cabrio as a preventative treatment for the control of anthracnose, powdery mildew (PM), and leafspots. The rates are 12 or 14 oz/A. The 14 oz/A is best for PM control if it is present and if conditions favor the spread of the disease.

-2. Applications prior to 10% bloom works with our strategy for preventative and proactive applications. I went back and checked my data and we started before bloom in more than one location. However, we already had a high incidence of disease when we began applications in 2 locations.

-3. Cabrio does not control gray mold. To my knowledge no strob(strobilurin) will. We have seen suppression of Botrytis in trials in both California and Florida. If we can keep the plants free of disease it appears the plants can "Fight Back" and we will recommend a good rotational partner for botrytis.

-4. As far as captan use: According to Frank's (Frank Louws) data the synergy with the Cabrio / Captan tankmix is very good (The Strawberry Grower, Vol. 10, No. 1, and http://intra.ces.ncsu.edu/depts/hort/berrydoc/jan12_03.htm). I will support this work wholeheartedly. I knew of the work with Quadris but did not feel I could say, "what ever you did with Quadris you can do with Cabrio" without knowing. Now that I have read Frank's article in the Strawberry newsletter (NCSA Newsletter) I have been promoting the tank mixture of Captan and Cabrio.

-5. Resistance management: BASF is promoting resistance management at all levels in the company. This includes Tech Service, R&D, sales, and marketing. As Barclay remembers, resistance management is part of my presentation. I probably spent more time on resistance management than on using Cabrio (this refers to Tom's presentation at the Preharvest Meeting in Rockingham Co., Feb 25, 2003)
We are receiving many calls about Cabrio in Strawberries. Cabrio is being accepted and applied by strawberry growers up and down the East Coast. One jug of Cabrio is 5 pounds or about 7 acres at 14 oz/A. Thank you for your support and if I can be of any assistance please call me.

Tom McKemie - BASF-Tech Service
7 Cameroons Place
Durham, NC 27703

(919)598-9088 (o)
(919)957-0095 (f)
(919)417-0730 (m)

Note: the specimen label for Cabrio or Quadris can be located by going to www.cdms.net.

9.0 Courier for whitefly control (Florida)

Rob Phillips UAP location manager in Delray Beach notes, “your S. Florida Vegetable Pest and Disease Hotline dated Feb. 14, 2003 contained insecticide recommendations for whitefly control in a nicotinoid resistance management program. In these recommendations you ... left out Courier (buprofezin). Courier has provided excellent whitefly control for many growers on the east coast of FL and other parts of the state. In addition, it has a label that allows for application on cucurbit crops, as opposed to Knack.” Thanks to Rob for pointing out this omission and providing readers with another excellent rotation partner for whitefly control.

(Gene McAvoy, ed., SOUTH FLORIDA VEGETABLE PEST AND DISEASE, HOTLINE, March 19, 2003).
10.0 Vitamin A Benefits, USDA research

Nutrition Detectives Probe Secrets of Vitamin A

Vitamin A can aid the immune system in fighting certain infections and inflammations. This essential nutrient, for example, can help clobber infections caused by some food-poisoning organisms.

However, in the case of pneumonia--and perhaps asthma and the common cold, as well--vitamin A may not be as helpful.

At the ARS Western Human Nutrition Research Center in Davis, Calif., innovative studies by research physiologist Charles B. Stephensen are helping solve the puzzle of why vitamin A interacts in these differing ways with the immune system. Findings from the research may lead to ways to capitalize on the ability of vitamin A-rich foods to boost the immune system.

Foods that provide Vitamin A include beef, chicken, turkey, sweet potatoes, pumpkin, carrots, spinach, collard greens and tomato products.

Experiments by Stephensen and his university and corporate colleagues are revealing more clues about vitamin A's influence on the types and amounts of beneficial cells and compounds that the immune system produces in response to attack.

In one early study, the scientists supplied animal immune cells with adequate amounts of a form of vitamin A called 9-cis retinoic acid, and exposed the cells to a simulated attack. This work showed--for the first time--that more of the cells quickly evolved into what are known as T-2 helper cells than into T-1 helper cells. This difference is important, because T-2 helper cells apparently are more proficient in fighting some pathogens than others.

In humans, that difference could strongly affect how quickly the body is able to overcome a particular pathogen.

The researchers used mouse immune cells for these petri dish tests. They plan to repeat these tests with laboratory mice--not just their
cells. Depending on the outcome, they expect to follow up with studies of healthy adult volunteers.

Details are in Agricultural Research magazine, posted on the World Wide Web at:
http://www.ars.usda.gov/is/AR/archive/mar03/vita0303.htm

ARS is the U.S. Department of Agriculture's chief scientific research agency.
(ARS News Service, Agricultural Research Service, USDA
Marcia Wood, (301) 504-1662, MarciaWood@ars.usda.gov, March 28, 2003)

11.0 Sandea Herbicide use tips

Sandea is Registered on Many Vegetable Crops: Sandea (active ingredient halosulfuron) has been registered by the Gowan Company for use on asparagus, cucumbers (including pickles), pumpkins, winter squash, summer squash, muskmelon, watermelon, snap beans, lima beans, tomatoes, peppers, and eggplant. Sandea is effective both preemergence and postemergence, although the type of application allowed varies with the crop. The herbicide is absorbed through roots and shoots and is translocated throughout the plant.

Sandea controls a number of problem weeds but must be combined with another herbicide for grass control. Probably Sandea's biggest plus is when applied postemergence, it will control yellow nutsedge. Preemergence applications of Sandea control galinsoga, kochia, common cocklebur, jimsonweed, ladysthumb and Pennsylvania smartweed, common lambsquarter, redroot and smooth pigweed, and velvetleaf. Postemergence applications of Sandea will also control pokeweed and giant ragweed but will not control jimsonweed and common lambsquarter. Irrigation or rainfall (1/4 to 1/2 inch) will improve preemergence activity by incorporating and activating the herbicide. Postemergence applications should be made to actively growing weeds 1 to 3 inches in height.
The registrations for Sandea vary somewhat depending on the region of the U.S. The use rate is generally 1/2 to 1 ounce of Sandea per acre. I will just highlight a few of the new registrations for Sandea. In Illinois, Sandea is registered on asparagus, both transplants, 6 weeks after fern development and established beds. This is one of the few herbicides registered for newly transplanted asparagus. It will provide broadleaf weed control and Poast or Fusilade can be used to control emerged grasses. Contact with the fern may cause temporary yellowing. Weed control will be more effective when Sandea is applied with drop nozzles to direct the spray below the fern and to get more complete weed coverage.

Sandea is now registered for use on a wide range of cucurbit crops, including direct seeded or transplanted cucumbers (including pickles) and cantaloupes, direct seeded pumpkins and winter squash and in row middles for muskmelon and watermelon. Postemergence applications of Sandea can be made at the 2 to 5 true leaf stage of direct seeded plants and at 14 days after transplanting. The ability to use Sandea postemergence on cucumbers, cantaloupes, pumpkins, and squash provides postemergence broadleaf control that was impossible in the past.

Another important use that Sandea allows in cucumbers and tomatoes are applications under plastic mulch. This application is especially important to suppress yellow nutsedge. Sandea should be applied to the soil surface after final bed shaping and before installation of the plastic mulch. This will increase the passes through a field for people with bed shapers that also lay plastic. Also transplanting must be delayed until 7 days after installation of the plastic.

The active ingredient in Sandea, halosulfuron, is an acteolactate synthetase inhibitor (ALS inhibitor) which is the same mechanism of action that Classic, Scepter, Pursuit, Accent, Beacon, etc have. The problem with this category of herbicides is that weeds (especially pigweeds and water hemp) can rapidly develop resistance to ALS inhibitors. Reduce the potential for weed resistance to Sandea by combining it with other herbicides and weed control strategies such as cultivation. Also when rotating crops avoid using Sandea multiple
years in a row and scout fields for newly occurring resistant weed biotypes.

The Sandea label also contains several precautionary statements to reduce the potential for crop injury and to ensure adequate weed control. Even with these limitations, Sandea will be a welcome addition to the herbicides registered for vegetable crops. (Rick Weinzierl, ed., Illinois Fruit and Vegetable News, Vol. 9, No. 3, April 4, 2003)

12.0 Sandea for nutsedge control

SANDEA* HERBICIDE FOR NUTSEDGE CONTROL.

The weed control program for melon crops has been enhanced by the full registration of preemergence and postemergence use of Sandea (halosulfuron) on cantaloupes, honeydews, crenshaws, watermelons, and other cucurbits. Purple nutsedge control using Sandea is very good in addition to activity on some other broadleaved weeds such as some of the pigweeds. Experiments conducted with Sandea have shown that early postemergence applications on small broadleaved weeds offered better results than preemergence applications immediately after planting. Sprinkler or furrow irrigation incorporation efficiency and comparisons need to be further investigated to optimize consistent soil efficacy. A sequential postemergence application on escaping weeds provides optimal weed control. If Sandea contacts the foliage melon crop phytotoxicity occurs with chlorosis on new growth and stunting. A vigorously growing crop will show less injury, if any, and will grow out of the observed symptoms. Crop injury will also result if crop oils or adjuvants other than non-ionic surfactants are used. The current Sandea label cautions users to observe some extended rotational crop plantback intervals until definitive data or practices prove adequate safety to sensitive crops. For fields severely infested with nutsedge, crop rotations that include sweet corn and melons can utilize Sandea applications in both crops to control nutsedge and additionally using sweet corn to shade out emerging nutsedge. Be sure to use only appropriately labeled herbicides for their intended labeled uses.
INIBAP, Montpellier, 21 January 2003  The world’s most popular fruit and a basic staple food for hundreds of millions of people in the developing world - the banana - is under severe threat from virulent pests and diseases. An article in the 16 January edition of the New Scientist magazine has warned of the risk of shoppers finding the shelves empty when they go to buy their weekly bunch. Articles and broadcasts from around the world have followed with alarming and sometimes exaggerated stories of extinction.

While this helps to raise awareness of the importance of bananas in the world and the threats faced by banana farmers, it is important not to lose sight of the facts and to point to the positive progress that researchers are making to address these challenges.

The New Scientist article focussed on concerns over the spread of a new form of Panama disease (Fusarium wilt) - known as race 4 - which is threatening the Cavendish variety, the world’s major export banana. The disease has spread through plantations in Australia, South Africa and parts of Asia. It is only a matter of time before race 4 reaches the hub of commercial production in Latin America and the Caribbean.

The Cavendish took over as the No. 1 dessert banana in the 1960s from the Gros Michel, a variety that had dominated world markets until it fell prey to an earlier form of Panama disease. So fears are justified.

Cavendish bananas are already under attack from another fungal disease, black Sigatoka, but are protected commercially by as many as 40 sprayings a year of fungicide. The sprayings are not only
expensive, making up a quarter of production costs, but present a serious risk to workers and a threat to the environment.

Unlike black Sigatoka, which attacks leaves, race 4 is a soil-borne fungus that attacks roots and cannot be controlled by fungicides. If race 4 reaches the commercial plantations, it is likely to wipe out Cavendish just as the earlier disease eradicated Gros Michel. The only option is to find another variety that resists race 4.

While the loss of the Cavendish would hurt consumers in developed countries, diseases have an even more severe impact on other types of banana, of which there are more than 500 varieties. Banana exports make up just 13% of world production. The other 87% represents bananas that never leave the country where they are produced. In the developing world banana is the most important food in terms of production value after rice, wheat and maize. Most banana farmers subsist on very limited margins and cannot afford the expensive chemicals to keep diseases in check. Epidemic diseases that attack these bananas undermine the very roots of food and income security for millions of people in the developing world. New resistant varieties are needed urgently.

What makes it difficult to breed new, improved varieties is that cultivated bananas are sterile and do not have seeds. They are propagated as suckers, or shoots, which arise from the base of the plant underground. There is no easy way to cross one variety with another. It is only in the past 10 years, after more than 80 years of research, that improved varieties acceptable for large-scale production have been made available.

Only five scientists, globally, are presently working to breed improved bananas. Such a meagre research effort is decidedly out of proportion to the scale and importance of the problem. But currently there is alarmingly little investment in banana research compared to the global significance of the crop. This must be reversed if the world’s most popular fruit, an important survival food for families in the tropics, is not to decline further.

With the progress already made, if we can mobilise new and significant investment, there is every reason to believe that the
banana will provide food and income security for those families for many years to come

http://www.inibap.org/new/release210103.doc

FAO Calls for Greater Diversity in Bananas

The Food and Agriculture Organization (FAO) is urging producers to promote greater genetic diversity in commercial bananas. Contrary to media reports that bananas may be extinct within 10 years, FAO says that new breeding methods and tools, including biotechnology, will be helpful to develop resistant bananas for cultivation. This does not necessarily mean the use of transgenics, FAO clarified.

In addition, it would be necessary to promote awareness of the inevitable consequences of a narrow genetic base in crops and the need for a broader genetic base for commercial bananas. Plant breeding programs in developing countries for banana and other basic staple crops also need to be strengthened.

FAO explained that the Cavendish banana, which is being hit by Fusarium wilt, accounts for only 10% of the total banana production. "What is happening is the inevitable consequence of growing one genotype on a large scale," said Eric Kueneman, Chief of FAO's Crop and Grassland Service. The Cavendish banana is cultivated mostly by large-scale banana companies for export.

Small-scale farmers, however are growing a wide range of bananas that are not being attacked by Fusarium wilt. Instead, a broad genetic pool has been maintained which can be used for future banana crop improvement. Banana is essentially a clonal crop with many sterile species, which makes progress through conventional breeding slow and difficult. Because of this, new breeding methods and tools, including biotechnology, will be helpful to develop resistant bananas for cultivation. This does not necessarily mean the use of transgenics, FAO said.
Since more than 50 percent of the banana germplasm (land races) are sterile, biotechnology and mutation breeding are important tools that can improve banana varieties without the threat of genetic drift, said FAO.

For more details, contact John Riddle, Information Officer, FAO at john.riddle@fao.org

From Crop Biotech Net: http://www.isaaa.org/kc/
(Clair H. Hershey, Editor, PLANT BREEDING NEWS, EDITION 136, 20 FEBRUARY 2003)

14.0 Rural energy grants available

FARM BILL ENERGY GRANTS AVAILABLE NOW

The Rural Business-Cooperative Service this week announced the availability of "$23 million in competitive grant funds for fiscal year (FY) 2003 to purchase renewable energy systems and make energy improvements for agricultural producers and rural small businesses." This money, mandated by the Energy Title of the 2002 farm bill, is available in the form of grants to cover up to 25% of the cost of energy improvements. To be eligible, an applicant must be an agricultural producer or rural business that can demonstrate financial need and whose entity is at least 51% owned by a citizen or legal resident of the United States. Applications for renewable energy systems must be for a minimum grant request of $10,000, but no more than $500,000. Applications for energy efficiency improvements must be for a minimum grant request of $10,000, but no more than $250,000. In future years, the Service will also offer loans and loan guarantees, but is implementing only the grant program in FY 2003. The application deadline is June 6, 2003. Complete eligibility requirements and application instructions are available at:
15.0 New Insights on the Double Helix

Structural biologists now believe that the DNA is much more than its famous structure. Recently, researchers examined the DNA molecule as it coils in the cell nucleus. They found out that the double helix regularly morphs into alternative shapes and weaves itself in knots. Contrary to the popular belief, researchers now have realized that the DNA has a fascinating life in three or perhaps four dimensions. This makes the DNA more than a simple string of code like it was believed for 50 years.

Some researchers believe that these mysterious movements may be just as important as the genetic sequence itself in deciding which genes are switched on and off.

The full report is published in Nature, Vol 421 or visit http://www.nature.com/nature
(Clair H. Hershey, Editor, PLANT BREEDING NEWS, EDITION 136, 20 FEBRUARY 2003)

16.0 PestNet Network for Pacific Region on WEB

PESTNET DEBUTS WEBSITE    PestNet, an e-mail network focused on crop protection in nations of the Pacific and Southeast Asia, recently introduced an extended, easily navigated new website at: http://www.pestnet.org. Elements of the site include information for joining PestNet, a guide for contributors, a photo gallery (still with some teething problems), plus additional material. PestNet is designed to help provide rapid advice and information on regional identification and management of plant pests. The target audience broadly includes all who have an interest in the topic. There is no cost to join PestNet and participate in the information exchange.
*---> mailto:PestNet@yahoogroups.com.  [#]
(IPMnet NEWS, April 2003, Issue 112)
17.0 Upcoming National meetings


* (NEW) 6-11 July 2003: XVth International Plant Protection Congress. Beijing, China. Contact: WEN Liping, IPPC Secretariat, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, #2 West Yuanmingyuan Road, Beijing 100094, China; Tel: +86 (10) 6281 5913; Fax: +86 (10) 6289 5451; Email: cspp@ipmchina.cn.net; http://www.ipmchina.cn.net/ippc/index.htm


* Organic Aquaculture Workshop, July 15, 2002, Minnesotta. Visit the ISEES website at: www-fw.umn.edu/iseses or contact Deborah Brister by e-mail at: djb@fw.umn.edu or by phone: 612-624-7723.

American Society for Plasticulture

The American Society for Plasticulture is holding the 31st annual Agricultural Plastics Congress at the Crowne Plaza Hotel in Grand Rapids, Michigan, August 16-19, 2003. For more information check their web site at http://www.plasticulture.org/ or call 814-238-7045.

* 11-14 August, 2003 * 6TH INTERNATIONAL CONFERENCE ON PLANT PROTECTION IN THE TROPICS, "Globalization and Plant Protection in Developing Economies," Kuala Lumpur, MALAYSIA. Contact: Secretary 6th ICPPT, c/o CABI-SEARC, PO Box 210, UPM Post, 43400 Serdang, Selangor DE, MALAYSIA. Eml: mailto:S.Soetikno@cabi.org. Fax: 60-3-8943-6400.

* 12-14 August, 2003 * 56TH NEW ZEALAND PLANT PROTECTION CONFERENCE, Christchurch, NEW ZEALAND. Contact: L. McKay, mail to:Lois.McKay@agresearch.co.nz. Web: http://www.hortnet.co.nz/publications/nzpps/conferen.htm.

* The 24th Annual International Irrigation Show & Conference November 18 - 20, 2003 in San Diego, California Go to http://www.irrigation.org/ia_show.htm for more information


* 21-24 June, 2004 * date specified * 1ST INTERNATIONAL SYMPOSIUM ON TOMATO DISEASES, Orlando, FL, USA. Contact: T. Momol, mail to:TMomol@ufl.edu. Phone: 1-850-875-7154. Web: http://plantdoctor.ifas.ufl.edu/istd.html.