Nov., 2001

Note: 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.

**Current Vegetable Experiments, UHM Extension**

Editor's note: We are currently conducting the following research at the different experiment stations. Please contact me at hector@hawaii.edu, if you are interested in visiting any of these experiments.

1) Effect of cover crops and compost amendments on pink root control in sweet onions, Kula Ag Park (Robin Shimabuku- project Leader).
2) Bittermelon variety trial, Waimanalo Station, varieties from several Asian countries.
3) Yard Long Beans variety trial in Waimanalo Station., several varieties. Follow-up Experiment to one conducted a couple of years ago.
4) Bittermelon variety trial, Poamoho Station.
5) Yard Long Beans variety trial, Poamoho Station.
6) Effect of phosphorus fertilizer rates on the yield of 3 leafy mustard varieties, Waimanalo Station.
7) Effect of phosphorus fertilizer rates on the yield of 3 leafy mustard varieties, Poamoho Station.
8) Effect of bokashi, EM sprays, and chicken-based compost applications on the yield of zucchini. Onion Herbicide trials (Arizona)

**EXPERIMENTAL ONION WEED CONTROL.**

The dry bulb onion crop stand initially emerged, but later in the season a significant crop stand reduction was observed for the
higher rate of Prowl* at 0.5 lb AI/A plus Prefar applied preemergence. A lower rate of Prowl at 0.25 lb AI/A plus Prefar also caused a reduction of the onion stand compared to the handweeded check or Dacthal*. Additionally, significant onion height reduction was observed for Prowl and Prefar herbicide combinations. The onions resumed growth, but the height was still slightly reduced later in the growing season compared to the handweeded check and the standard herbicide, Dacthal*. These results were observed last year on furrow irrigated onions when about 2.5 inches of rainfall occurred as the crop was being established. Similar results were observed in previous experiments where sprinklers were used to establish an onion stand. Always review and follow herbicide labels before making applications. (Kai Umeda, Arizona Maricopa County, VEGETABLES NEWSLETTER vol 8, issue 10, October 12, 2001)

SCLEROTINIA BLIGHT IN TOMATO

Sclerotinia blight (also known as white mold) was observed this week in a field of ground tomatoes. Infections may have occurred during the wet period in May and early June. Irrigation may have provided conditions for symptoms to grow worse. Symptoms of this disease are most apparent in the stem, where stems are in direct contact with the ground. Sections of stem turn a bleached gray or white, like animal bones dried in the sun. White cottony mold (mycelia) grows on infected stems, and black hard irregular-shaped nuggets (about 1 inch in size, called sclerotia, “sklare–oh-shu”) form on the outside and inside of the stem. Foliage above the infected stem wilts and dies. Fruit may also be infected. The presence of black sclerotia help distinguish this from other diseases that produce a white fuzzy mold such as Phytophthora.

The disease develops only when soil is at field capacity for about 10 days and temperatures are relatively cool. These conditions cause sclerotia to germinate and release spores. Spores infect senescent tissue such as fallen flower blossoms. Once established, the fungus invades healthy tissue. There is generally only one infection period in each growing season unless new sclerotia are brought up near the soil surface through tillage practices and favorable environmental conditions reoccur. Chemical applications are useful only during the
initial infection period. Once the disease is established, fungicides are of no value. Infections spread to new tissue only through direct contact with other infected tissue.

Sclerotinia blight is a disease that is difficult to manage. Susceptible crops include tomato, beans, lettuce, cabbage and other crucifers, peppers, and potato as well as agronomic crops (alfalfa, canola, soybean, sunflower), and weed species (ragweed, velvet leaf). The sclerotia (the hard black structures) allow the fungus to survive for many years in the soil. The sclerotia look like large mouse droppings and are usually embedded in the fruit and stems of the plants. A single head of cabbage can have thousands of sclerotia.

If practical, remove diseased plants and fruit from the field. Plowing will preserve the sclerotia in the soil but will put them at a depth that will inhibit germination. Discing will tend to place the sclerotia in a more favorable place to germinate. Like many seeds, sclerotia will only germinate when they are within an inch of the soil surface. Improving drainage by chisel plowing would also be of value. Rotate with non-susceptible crops such as corn. --R. Wick and R. Hazzard, (University of Massachusetts Agroecology Program Vegetable IPM Newsletter, AUGUST 30, 2001, VOLUME 12, NUMBER 16).

Whitefly insecticide resistance management tips

Plant whitefly-susceptible crops when they are at least risk of developing severe whitefly infestations. Use the best management practices to produce crops in as short a period of time as possible while maintaining yield and quality. Practice crop and weed sanitation year-round by controlling weeds, such as sunflower, sow thistle and volunteer crops that are whitefly hosts. Treat whiteflies and other insects when economic thresholds are reached after monitoring field populations. Use insecticides least harmful to predators and parasites for control of whiteflies and other insects. Do not repeatedly use the same insecticide or a single class of insecticides to control silverleaf whiteflies. (Source: The Grower, May 2000).
Stinkbug and potato aphid control in Tomatoes

Research in California with reduced-risk pesticides found the following information for the control of stink bugs and potato aphids in tomato: The top and inner canopies were best covered using 180 gallons/acre of water, followed by 120 g/acre, and showing no real difference between 60 and 30 g/acre (with an Kyndesoft Air assist sprayer). For coverage of the top canopy, nozzle type made no difference, among those tested. For coverage of the inner canopy, nozzle type did make a difference. Hollow cone without air assist (HC) provided significantly greater coverage, with no significant differences between the flat fan and air assisted hollow cone nozzles. The researchers concluded that "hollow cone nozzles and higher water volume application (between 120 and 180 gallons/acre) will improve vertical canopy spray deposition of pesticides on mid-seaseon processing tomatoes." High concentrations of narrow range oils have been proven as high as 90% effective against the aphid as long as the oil contacts and suffocates the insect. Other reduced risk trials (Safer's soap, Neem oil, JMS stylet oil, etc) had a very low field efficacy, though performed acceptably in laboratory trials. The neonicotinoid Actara, and the newer generation pyrethroid Warrior provided 73 to 100 percent and 75 to 100 percent control, respectively for potato aphid. These materials performed much more reliably for aphid control than any Orchex oil combinations. The stink bug efficacy results were labeled "highly variable" but in the end Warrior (3.84 oz) and Actara (4.5 oz) offered the best control. Warrior also performed better in adult bug control than any other treatment or the untreated control. (Exerpted from Darl Larsen, Vegetable West Mag. July 2000). Update on use of Bt's for Caterpillar control

Caterpillar (DBM) control updates, and use of Bt

Note of reminder concerning DBM pest control in Hawaii provided by Dr. John McHugh: "It's worth pointing out that because Spintor 2SC has the same active ingredient as Success (spinosad) that crucifer/cole crop farmers on the Diamondback Moth/Success Insecticide Resistance Management program in Hawaii (Oahu, Maui, Kamuela) should not be using it in their spray programs."
Bt's update from Florida: Although most growers are using Bt's as their first line of defense against worms, rainy weather is making worm control with Bt difficult.

Increased knowledge base has led to many improvements, including genetically improved Bt's. Today's Bt insecticides have a couple notable advantages over their predecessors:

More concentrated. Instead of using 2 pounds of product per acre as they did 20 years ago, growers now use 0.5 to 1 pound. Benefits are better control and fewer containers to be handled and disposed of.

Improved formulations. The first Bt insecticides were formulated as wettable powders. Newer products come as water dispersible granules (WDGs), dry flowables (DF) and stable liquids. These formulations are easier and more convenient to handle and mix, and they're less susceptible to wash off. As a result of this progress, today's Bt's are more effective, especially on some key Florida pests such as armyworms and diamondback moth.

Bt's are recognized as "soft" insecticides. They're easy on beneficials, provide little or no threat of environmental pollution and are relatively safe to handlers and applicators. The "soft" approach of insect control with Bt insecticides has helped ensure that beneficials will remain in the field and help protect crops. These products are typically assigned a "caution" signal word, and they have short re-entry and preharvest intervals.

In spite of their advantages, Bt's have some inherent limitations. First, they're relatively short-lived in terms of residual on the plant. Most Florida growers apply them at weekly intervals, expecting only three to five days of optimum activity before photodegradation dilutes the control potential.

Bt's remain on plant surfaces and do not move into plant tissue. This leaves them susceptible to washoff during rainy periods.

Fortunately when Bt's fail to provide adequate control growers have access to a number of new 'soft' insecticides for the control of lepidopterous pests in vegetables. These newly introduced insecticides are notable in that their active ingredients are all unique chemistries with different modes of action. In addition, these products demonstrate differing routes of activity. Several of these compounds possess translaminar or locally systemic activity. These insecticides are capable of penetrating the leaf lamina causing mortality through contact and ingestion. In others ingestion is the primary type of activity.
<table>
<thead>
<tr>
<th>Product</th>
<th>Active ingredient</th>
<th>Mode of action</th>
<th>Route of Activity</th>
<th>Effective Rates (oz/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spintor</td>
<td>spinosad</td>
<td>neurotoxic</td>
<td>translaminar</td>
<td>4.0 – 6.0 oz</td>
</tr>
<tr>
<td>Confirm</td>
<td>tebufenozide</td>
<td>IGR</td>
<td>ingestion</td>
<td>6.0 – 8.0 oz</td>
</tr>
<tr>
<td>Proclaim</td>
<td>emamectin benzoate</td>
<td>neurotoxic</td>
<td>translaminar</td>
<td>2.4 – 4.8 oz</td>
</tr>
<tr>
<td>Avaunt</td>
<td>indoxacarb</td>
<td>neurotoxic</td>
<td>translaminar</td>
<td>2.5 – 3.5 oz</td>
</tr>
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**Avaunt (indoxacarb - DuPont)** acts on the nervous system of beet armyworm and cabbage loopers after ingestion or contacting the larvae.

**Proclaim (emamectin-benzoate - Syngenta)** is also a neurotoxin but is ingested by the worm when it penetrates and moves from top to bottom of the leaf surface.

**Spintor (spinosad – Dow AgroSciences)** is similar to Proclaim in being a neurotoxin and moving translaminally in the leaf tissues.

**Confirm (tebufenozide - formerly Rohm and Haas and now Dow AgroSciences)** is an ingested insect growth regulator that disrupts the larval molting process.

In addition to these, growers still have access to many of the traditional stand-bys such as Lannate and the various synthetic pyrethroids.

With careful scouting and all the choices available to growers worm control has become much easier in the past few years. By considering a chemical’s characteristics, pest pressure development and feeding behavior, and growth patterns and susceptibility of the crop to the pests, growers should be able to fit these new insecticides into use patterns that will optimize efficacy and economics to manage worm pests. (Gene McAvoy, editor, South Florida Pest and Disease Hotline. September 14, 2001)
Bacterial Spot Peppers and tomato

Bacterial spot is one of the most serious diseases of tomato and pepper in Florida because it can spread rapidly during warm periods with wind driven rains, and because fruit symptoms reduce marketability. Bacterial spot is caused by the bacterium, Xanthomonas campestris pv vesicatoria. Entry into the plant occurs through natural plant openings or wounds made by wind driven soil, insects, or cultural operations. Bacterial spot can be seed transmitted, but most inocula comes from volunteers or infected debris from tomatoes or peppers in the soil. Temperatures of 75-87°F are ideal for bacterial spot but infections can occur at higher or lower temperatures.

Symptoms of bacterial spot appear as small, water-soaked, greasy spots about 1/8 inch in diameter on infected leaflets. On tomatoes, distinct spots with or without yellowing occur. Individual leaf spots may coalesce with each other, resulting in the browning of entire leaflets. Fruit spots often begin as dark specks with or without a white halo. As spots enlarge, they become raised and scab-like.

In pepper, symptoms are similar to those in tomato, except that spots may be lighter in color and fruit lesions may appear blistered. In mature plants, leaflet infection is most concentrated on older leaves and defoliation may occur in severe infections.

Other diseases may cause leaf spots that appear similar to those of bacterial spot. Positive diagnosis requires lab tests.

An integrated approach is needed to manage this disease. Sanitation is important. Pepper and tomato volunteers and solanaceous weeds should be destroyed between crops. Transplant houses should be located well away from tomato or pepper fields. Purchase only certified disease-free transplants.

Since water movement spreads the bacteria from diseased to healthy plants, workers and farm equipment should be kept out of fields.
when fields are wet because the disease will spread readily under wet conditions.

There are commercial pepper varieties that are resistant to races 1, 2 and 3, but researchers have identified no fewer than ten different races of Xanthomonas campestris. Since no variety incorporates resistance to all known races, it is important that growers use varieties that have resistance to races that occur in their area. Research indicates that use of resistant varieties over time will cause a shift in the make-up of bacterial spot populations toward races for which a given cultivar lacks resistance. The race situation is similar but less clear in tomato. No resistant tomato varieties are available commercially.

It is important to apply sprays before and during rainy periods. If conditions are favorable, frequent spraying may not be sufficient to maintain bacterial spot below damaging levels.

Tests support the traditional recommendation of copper and maneb or mancozeb for bacterial spot control. Attention to application techniques is as important as choice of material in achieving adequate control. In trials, bacterial spot control was better with applications twice a week compared to once a week. The effectiveness of copper is limited, because of the widespread occurrence of copper tolerance among strains of X. campestris pv. vesicatoria.

Although there was hope that the SAR elicitors (Messenger - Eden BioScience and Actigard - Syngenta) would be provide effective tools against bacterial spot experience indicates that these should be used in conjunction traditional copper-maneb tank mixes and can be expected to give only marginal improvement in control.

Some growers have reported success, using bacteriophages (bacterial virus) for the control of bacterial spot. Phages are most effective when applied at night or very early in the morning as they are rapidly deactivated by sunlight and drying.

Growers should be aware that the use of organosilicate adjuvants and applications of magnesium might increase the incidence and
severity of bacterial spot infections. (Gene McAvoy, editor, South Florida Pest and Disease Hotline. September 14, 2001)

**Broad mites on eggplant & pepper (Florida)**

**Spotty but widespread occurrence of broadmites at low levels in older pepper and eggplant are being seen on both coasts.** Infestations have been sprayed where detected and are mostly under control. Thiodan, Agrimek, and Kelthane have all been used for broadmite control. Growers are advised to use care when applying Kelthane to avoid crop damage. From grower experience, Kelthane should be used alone and rates should not exceed 1 pint per 100 gallons, especially on hot days (Gene McAvoy, ed. Univ. Florida, SOUTH FLORIDA VEGETABLE PEST AND DISEASE HOTLINE, September 28, 2001).

Chemical control of broadmite is not difficult but sprays must be timely to be successful. Kelthane or dicofol, micronized sulfur (i.e. Thiolux) and AgriMek have all given good results locally. It should be noted that none of these materials kills eggs or seems to have enough residual to kill all hatching larvae. Therefore, to achieve control it is necessary to make two applications about 5 days apart to allow time for eggs to hatch and target emerging larvae. Growers are advised to use care when applying Kelthane to avoid crop damage. From grower experience, Kelthane should be used alone and rates should not exceed 1 pint per 100 gallons, especially on hot days. Some growers report good control using a combination of Agrimek and Trilogy. Growers should scout frequently as current weather conditions are favorable for increased broadmite pressure. (Gene McAvoy, ed., Univ. Florida, South Florida Pest and Disease Hotline, October 12, 2001)

**Nicotinoid Resistance Management Strategies**

With the labeling of additional nicotinoid compounds, (Platinum and Actara/ Syngenta – and more in the pipeline from other manufacturers), growers are urged to be careful not to over use this class of compounds to avoid the development of resistance. **Because imidaclorpid and thiamethoxam are both in the nicotinoid class of insecticides, there is potential for the development of cross-resistance.** Such cross-resistance has already been observed in Spain. This fact lends additional import to the necessity for attention to resistance management.

Nicotinoid Resistance Management Strategies Reduce overall whitefly populations by strictly adhering to cultural
practices including: Planting whitefly free transplants Delay planting of new crops as long as possible and destroy old crops immediately after harvest to create or lengthen a tomato-free period Do not plant new crops near or adjacent to infested weeds or crops, abandoned fields awaiting destruction or areas with volunteer plants Use UV reflective (aluminum) plastic soil mulch Control weeds on field edges if whiteflies are present and natural enemies are absent Manage weeds within crops to minimize interference with spraying Avoid U-Pick or pin-hooking operations unless effective whitefly control measures are continued Do not use a nicotinoid on transplants or apply only once 7 – 10 days before transplanting; use other products in other chemical classes, including pymetrozine (Fulfill®) before this time. Apply a nicotinoid at transplanting and use other products of other chemical classes, such as the insect growth regulators Knack® or Applaud® as the control with the nicotinoid diminishes Never follow an application (soil or foliar) of a nicotinoid with another application (soil or foliar) of the same or different nicotinoid on the same crop or in the same field within the same season (i.e. do not treat a double crop with a nicotinoid if the main crop had been treated previously) Save applications of nicotinoids for crops threatened by whitefly transmitted plant viruses or whitefly inflicted plant disorders (i.e. tomato, beans or squash) and consider the use of chemicals of other classes for whitefly control on other crops.

Growers are urged to follow these recommendations and help assure the continued effectiveness of these important whitefly management tools. Excerpted from Monitoring Susceptibility of the Silverleaf Whitefly to Imidacloprid, David J Schuster and Sandra Thompson, Proceedings of the 2001 Florida Tomato Institute. (Gene McAvoy, ed. Univ. Florida, SOUTH FLORIDA VEGETABLE PEST AND DISEASE HOTLINE, September 28, 2001).

CERCOSPORA LEAF SPOT ON SWISS CHARD

Cercospora leaf spot on swiss chard has been a problem this year. Symptoms are spotting and blighting of leaves. The fungus can be
seed-borne but may overwinter on plants in the same plant family. Copper is registered to control this disease. Plow infected debris under to hasten destruction of the fungus, and rotate out of this crop family for two years. Copper applications should be made at the very first sign of disease symptoms. Avoid dense plantings and shady areas, and encourage good air circulation. (University of Massachusetts Agroecology Program Vegetable IPM Newsletter, AUGUST 30, 2001, VOLUME 12, NUMBER 16).

WATERMELON ANTHRACNOSE

(Dan Egel) - I observed anthracnose on watermelons in Lawrence County this week. Thanks to County Educator David Redman for the heads up. Growers may lose money on a shipment of watermelons that have anthracnose. However, other problems resemble anthracnose. Therefore, it is in the grower's best interest to know the diagnostic signs, of anthracnose infection.

Initial symptoms of anthracnose infection on watermelon foliage include irregular-shaped dark brown leafspots. The leafspots may have pointed margins and the center of the lesion- may fall out. The lesions can usually fit within the circumference of a dime. Lesions on stems and petioles are generally oval sunken, and tan to salmon colored. Sunken fruit lesions most often occur on the melon surface nearest the ground. Fruit lesions are ALWAYS observed along with distinct clusters of collapsed vines. The point is that growers. should be aware of anthracnose infections long before the fruit are harvested and loaded onto trucks.

There are no varieties of watermelons that are completely resistant to anthracnose. Seed catalogs will occasionally list watermelon cultivars as resistant to race I of anthracnose. However, almost all modern cultivars of watermelon are resistant to race 1 of anthracnose, which is much more likely to cause disease of cucumbers and muskmelon. No watermelon cultivars exist which have adequate resistance to race 2 of anthracnose. To prevent epidemics of anthracnose from developing, most growers will find it necessary to use foliar fungicides. The MELCAST system can be used to determine when to spray. Grower- who have been using Bravo for protection against gummy stem blight and alternaria leaf blight also are protected against anthracnose. Trials in Vincennes and Lafayette
indicate the Mancozeb fungicides (Dithane DF, Penncozeb, Manzate 200) consistently out-performed Benlate and Top-in in terms of anthracnose control. Always read the label carefully. Reduce the amount of overwintered inoculum by fall plowing and crop rotation. (Dan Egel, Editor. *Ohio State Univ. Vegetable Crops Hotline* August 23, 2001)

**WATERMELON DISORDERS**

(Chris Gunter) - As the melon harvest begins to wind down, you have a good idea of the fruit disorders that have occurred in your crop this year. Watermelons are susceptible to various physiological disorders. Prevention of these disorders before they appear in your crop will help improve harvestable yields and increase crop quality.

**Hollowheart** is a separation of the flesh within the fruit. This disorder can occur wherever watermelon is grown. It becomes economically significant when the incidence of hollow melons in a load leads to rejection of the shipment. Generally the incidence of hollow heart is higher in crown-set fruit. Seedless fruit tend to have more hollow heart than seeded varieties. This disorder is likely to occur early in fruit development. Though the exact cause has not been clearly defined, environmental conditions appear to be involved. Rapid fluctuations in water availability and/or temperature early in the season may increase the incidence of this disorder. Poor pollination and excessive water or nitrogen during fruit set also increase the amount of hollowheart in the crop. The solution to this disorder is to maintain even growth throughout the season, avoiding periods of rapid growth followed by slow growth periods or vice versa. Careful water and fertility management will help to even the growth rate through the season. In areas where hollowheart has traditionally been a problem selecting cultivars that have lower rates of hollow heart is desirable. Low pollination has also been linked to increased hollowheart, especially in seedless watermelon, so insuring maximum pollination is also important to reduce the disorder in these melons.

**Misshapen or bottleneck refers** to the constricted growth at the stem end of the fruit. This is usually due to a lack of pollination. This becomes clear, in seeded watermelon, when the fruit is opened and no seeds are visible at the stem end of the fruit. Oblong varieties are more prone to bottleneck than varieties with a round shape. Poor pollination can result either from low bee populations or poor bee activity due to weather or other factors.

**Sunburn** is another disorder that appears each year and is common in all watermelon growing areas. It appears as a gray or white area on the uppersurface of the fruit. This disorder occurs when the fruit surface is exposed to the sun. When vines are vigorous and healthy, fruit are protected from direct exposure to the sun by the foliage. If there is a disease or stress on the plant, which causes a breakdown of the leaves or dying back of the foliage, developing fruit can be exposed to the sun. Maintenance of healthy foliage through proper water, nutrient and disease management will help minimize
the occurrence of sunburned fruit. Also, fruit with dark colored rind-, are more susceptible to this damage than those with fight colored rinds. Proper variety selection may help reduce the incidence of this disorder. (Dan Egel, Editor. Ohio State Univ. Vegetable Crops Hotline August 23, 2001)

Platinum and Actara Registered, Potential problems of resistance, including use of Admire

The EPA recently registered two Syngenta Crop Protection products for control of sucking and chewing pests. Platinum is a soil insecticide for use in potatoes, tobacco and fruiting and cucurbit vegetable crops. Actara is a foliar insecticide for use in potatoes, pome fruit, tobacco, fruiting vegetables and cucurbits.

The EPA registration of Actara is particularly good news for south Florida pepper producers, who have been awaiting labeling to provide them with a new tool against pepper weevils which can cause devastating losses particularly late in the season. Trials conducted by UF/IFAS entomologist Dr. Phil Stansly in Immokalee, have shown the product to be particularly efficacious against weevils.

"One application of Platinum at planting provides long-lasting control of major sucking and chewing insects," says Coby Long, Syngenta insecticide brand manager. "For growers who prefer foliar application, Actara offers excellent residual control with a wide margin of worker safety." Platinum and Actara both contain the active ingredient thiamethoxam, a second-generation neonicotinoid insecticide. Thiamethoxam has unique chemical properties that offer several advantages over other chemistries, according to the company.

Platinum works faster and more consistently than competitive soil insecticides, according to the company. Platinum is quickly taken up by developing roots and moves rapidly throughout the plant. Once inside the plant, the active ingredient moves upward to protect new growth and provides long-lasting residual control.
Actara foliar insecticide offers extended residual control because it quickly penetrates and moves throughout plant leaves. "We’re using a new term—trans-stemic—to describe this movement," White explains. "This means Actara combines translaminar and locally systemic action in one product."

Thiamethoxam has minimal impact on most beneficial insects, which makes it well suited for integrated pest management programs. It is not known to be cross-resistant to any other insecticide class.

While the labeling of Platinum and Actara is welcome news, both are in the nicotinoid class of insecticides and growers must be careful not to overuse this class of compounds to avoid the development of resistance.

**Most growers would agree that the silverleaf whitefly is one of the most important insect pests of tomato in Florida.** The insect causes losses by inducing irregular ripening and by transmitting the geminiviruses tomato mottle virus and tomato yellow leaf curl virus. To avoid these losses nearly 100 percent of tomato transplant producers and field growers apply imidacloprid (Admire 2F® – Bayer) primarily as a drench. This heavy reliance on single insecticide for silverleaf whitefly management may lead to resistance to imidacloprid.

**Resistance to imidacloprid has already been detected in greenhouse tomato production areas in Spain.** In an effort to monitor and assess the susceptibility of whitefly populations in Florida to imidacloprid, Dave Schuster, entomologist at the UF/IFAS Gulf Coast Research and Education Center sampled a number of whitefly populations during the 2000-2001 growing season. Although most of the 13 populations sampled had relatively low LC\(_{50}\) values indicating continued susceptibility to imidacloprid, two populations had significantly higher LC\(_{50}\) values that could represent a trend toward increased tolerance. One of these two samples was collected in Immoklaee. Although the limited sampling period and small number of samples collected permit no conclusions to be drawn from these observations, the elevated LC\(_{50}\) values should encourage growers to adhere resistance management recommendations.
This situation has become even more critical with the recent approval of the new insecticide, thiamethoxam – Syngenta Crop Protection for whitefly control on tomato and other crops. This insecticide is being formulated and marketed as Platinum® for soil applications and Actara® for foliar use. The use patterns of these formulations are anticipated to be similar to those of Admire® and Provado® respectively. Because imidacloprid and thiamethoxam are both in the nicotinoid class of insecticides, there is potential for the development of cross-resistance. Such cross-resistance has already been observed in Spain. This fact lends additional import to the necessity for attention to resistance management.

Nicotinoid Resistance Management Strategies

Reduce overall whitefly populations by strictly adhering to cultural practices including:

- Planting whitefly free transplants
- Delay planting of new crops as long as possible and destroy old crops immediately after harvest to create or lengthen a tomato-free period
- Do not plant new crops near or adjacent to infested weeds or crops, abandoned fields awaiting destruction or areas with volunteer plants
- Use UV reflective (aluminum) plastic soil mulch
- Control weeds on field edges if whiteflies are present and natural enemies are absent
- Manage weeds within crops to minimize interference with spraying
- Avoid U-Pick or pin-hooking operations unless effective whitefly control measures are continued

Do not use a nicotinoid on transplants or apply only once 7 – 10 days before transplanting; use other products in other chemical classes, including pymetrozine (Fulfill®) before this time.

Apply a nicotinoid at transplanting and use other products of other chemical classes, such as the insect growth regulators Knack® or Applaud® as the control with the nicotinoid diminishes Never follow an application (soil or foliar) of a nicotinoid with another application (soil or foliar) of the same or different nicotinoid on the same crop or in the same field within the same season (i.e. do not treat a double crop with a nicotinoid if the main crop had been treated previously) Save applications of
nicotinoids for crops threatened by whitefly transmitted plant viruses or whitefly inflicted plant disorders (i.e. tomato, beans or squash) and consider the use of chemicals of other classes for whitefly control on other crops.

Growers are urged to follow these recommendations and help assure the continued effectiveness of these important whitefly management tools.

Excerpted from Monitoring Susceptibility of the Silverleaf Whitefly to Imidacloprid, David J Schuster and Sandra Thompson, Proceedings of the 2001 Florida Tomato Institute. (Gene McAvoy, editor, South Florida Pest and Disease Hotline. September 14, 2001)

Phosphorus Levels in Iowa Waters Are Among Highest in the World

Editor's Note: Phosphorus levels in the soil water solution are becoming an environmental concern in several areas. In Hawaii, the EPA, the NRCS, and CTAHR currently have programs to try to address this issue. I am currently working on a research and educational project with the NRCS (Natural Resources and Conservation Service), and several colleagues, to tune-up P fertilizer recommendations for vegetable growers, with the goal of minimizing P applications in soils that already have excessive P levels. The article below, is an update from the Alternative Ag Newsletter of the Institute of Alternative Agriculture.

The levels of phosphorus that now exist in Iowa waters are some of the highest in the world, John A. Downing, professor of aquatic ecology at Iowa State University, told Successful Farming Online (September 21, 2001). "That is neither normal nor healthy," he said. "Abundant P generates unnaturally vigorous algal growth, or 'algae blooms.'...When algae blooms occur, 'eutrophic' systems begin to break down and lose much of their value to people and to nature." One of the negative impacts of eutrophication is the unpleasant smell of decomposing algae, impairing the recreational use of water; a benefit of good water quality, Downing estimates, is that Iowa lakes generate more than $20,000 per lake-acre, per year. (Henry A.
EPA Looks to Restrict Guthion, Imidan Uses

Nov. 8, 2001 - The EPA recently announced proposed new restrictions on the use of two agricultural pesticides, azinphos-methyl (Bayer’s Guthion) and phosmet (Gowan’s Imidan). The proposed new rules will affect vegetable growers including those who grow dry and fresh peas, brussel sprouts, potatoes and sweet potatoes. The biggest proposed change will effect potato growers who would no longer be able to use Guthion. Generally, Imidan will face a change in its re-entry interval for peas, sweet potatoes and potatoes. The re-entry period for those crops will rise from 24 hours to five days. The products are still governed under workers’ protection regulations, which offers exemptions for scouting and also for non-contact activities such as opening flood irrigation gates, according to Gowan. The EPA is accepting public comments on the impact of the proposed measures on growers over the next 60 days. Comments can be made on-line at www.epa.gov/pesticides. Overall for Imidan, three uses are being voluntarily cancelled, nine crops are being authorized for use under specific terms for five years and 33 crops are being approved for continued use. A group of nine crops will be authorized for use for five years under specific terms: apples, apricots, blueberries, crab apples, grapes, nectarines, peaches, pears and plums/dried plums. For Guthion 28 crop uses are being canceled, seven uses are being phased-out over four years and eight crop uses will be allowed to continue with "time-limited" registration for another four years. Prior to the expiration of the four-year period, the EPA will conduct a comprehensive review of these eight crop uses, based on the latest scientific information, to determine if registration will be allowed to continue. The crop uses being phased out in four years include those for almonds, tart cherries, cotton, cranberries, peaches, pistachios and walnuts. The crops with time-limited registrations include apples/crab apples, blueberries, sweet cherries, pears, pine seed orchards, brussel sprouts, cane berries and the use of Guthion by nurseries for quarantine requirements. "Bayer contends that EPA's proposed action would unnecessarily take away from farmers, or too severely

End of Year Weed Scouting (Massachusetts)

It is worthwhile to take the time to check your fields for weed problems at this time of year. A quick scouting can alert you to problems that will be expensive to solve if they get out of control and can give you clues that will help you in designing your weed management program for next year.

Things to look for when you scout: How Many? How dense are the weeds? If weeds are very dense, they may be having an impact on your yields. This is especially true if these weeds emerged early in the season, when competition is greatest. If weeds come into your field during the period of greatest crop growth, you may want to consider changing your weed management program.

Which Weeds? Identifying weeds can help you identify potential problems before they get out of hand, and can help you decide if you need to modify your weed control program. Weeds like yellow nutsedge, hedge bindweed, and quackgrass are spreading perennials, which have underground parts that enable them to spread throughout whole fields. Because these weeds can be very damaging, and are very difficult to control, they are worth "nipping in the bud." In addition, keep an eye out for annual weeds which are new to your field or increasing in numbers. Some weeds can be very difficult to control in some or all of the crops in your rotation. Galinsoga, for example, is hard to control in cole crops, peppers, and squash. Nightshades are difficult to control in tomatoes for growers who rely on herbicides for control, because they are in the same family as tomatoes. Velvetleaf is hard to control in sweet corn. Spot treatment with Round-up, or hand pulling or hoeing, is worthwhile to eradicate small patches of particularly threatening weeds.
What worked? It is also useful to look at the whole field and evaluate the effectiveness of your weed control efforts. If some weeds are generally escaping, identify them. They may point to weaknesses in your herbicide or cultivation program. If mostly grasses, or mostly broadleaves are escaping, it may mean you need to adjust either the rates or the timing of your grass or broadleaf herbicides. You may also find the New England Vegetable Management Guide useful. This manual contains a chart listing the effectiveness of vegetable herbicides on most of the common weeds in New England. You can use this guide to find an herbicide labeled for your crop which might give better control.

Where are the weeds? Weeds in the rows or planting holes are much more damaging to crop yields than between-row weeds. Weeds in rows may be an indication that cultivation equipment needs adjustment, or cultivation needs to be done earlier. Mapping weedy spots, and keeping some kind of permanent record of weed surveys, can help you evaluate your weed management over the years.

What to do now? Once crop harvest and weed scouting is compete, disk or till the fields to destroy existing annual weed growth and to reduce or prevent weed seed dispersal. If perennial weeds such as bindweed or quackgrass are present, consider an application of Roundup before cold weather arrives. Time spent on these tasks now will greatly improve your level of weed management next season. --By: R Bonanno (Vegetable IPM Newsletter, Agroecology Program, University of Massachusetts, SEPTEMBER 6, 2001, VOLUME 12, NUMBER 17)

Greenhouse conference North Carolina North Carolina Greenhouse Vegetable Growers’ Association is having Its Annual Conference Oct. 22-24 at the Brownestone Hotel in Raleigh, NC. For information contact: Dr. Mary Peet mary_peet@ncsu.edu.

**Impact of Ag Research: Report by NRC**

NATIONAL RESEARCH COUNCIL RELEASES REPORT ON EFFECTS OF RESEARCH

**Greenhouse Workshop in Arizona, Jan. 2002**

**CONTROLLED ENVIRONMENT AGRICULTURE SHORT COURSE.** Register for 2 days of continuing professional education about plant sciences, engineering, and marketing related to greenhouse production. The major topics of plant production, nutrition, irrigation, pest management, marketing, and environmental control were developed specifically for Arizona and the southwest. Crop specific examples of hydroponic tomato production or floral plant production will be presented. The program will utilize state-of-the-art instructional computer technology to be supplemented with traditional notebook handouts, and laboratory-style demonstrations by the topic experts. The January 20-22, 2002 short course will be in Tucson for all growers, greenhouse industry related agribusiness persons, and educators. A tour of a commercial tomato production greenhouse is planned to follow the short course. Details are at: http://ag.arizona.edu/ceac/extension/cpesJan02.htm (Kai Umeda, Arizona Maricopa Coutny, VEGETABLES NEWSLETTER vol 8, issue 10, October 12, 2001)

**New Canadian Center Is Dedicated to Organic Agriculture**

A new, government-funded Organic Agriculture Center of Canada will be based at the Nova Scotia Agricultural College in Truro and will carry out initiatives in collaboration with colleges and universities across Canada. The center will "quench a growing thirst for knowledge in this fast emerging sector and give Canada's producers an advantage over international competition," according to the office of Agriculture and Agri-Food Canada. Federal funding will be used to develop at least four Web-based courses in organic agriculture, conduct on-farm research on strategies for transition to organic production, conduct market research to identify
opportunities for producers, catalog existing research, and develop a "help" desk. Canada's organic sector currently produces $1 billion in annual sales, and is growing at a 20 percent rate annually. (Henry A. Wallace Center for Agricultural & Environmental Policy, Alternative Agriculture News, Volume 19, Number 10 (October 2001)

Farmers market, marketing ideas on the WEB

Three new free selections from the book, The New Farmers Market: Farm-Fresh Ideas for Producers, Managers & Communities, are available as free PDF downloads at http://www.nwpub.net/nfm.html#. They are:


Minor Use Pesticide WEB SITE

EPA has also created a new minor use web page, http://www.epa.gov/pesticides/minoruse/ which provides links to the report and related information on the Agency's minor use activities and partnerships with other agencies. Copies of the Report on Minor Use Pesticides may be obtained on the new minor use web site or by calling 1-800-490-9198.

Minor uses of pesticides are those for which the total United States production for a crop is fewer than 300,000 acres, or those uses which do not provide sufficient economic incentive for a registrant to support initial or continuing pesticide registrations. Minor uses
of pesticides occur on fruits and vegetables and for control of
disease vectors, such as mosquitoes, ticks, cockroaches, rodents and
disease-causing organisms. (Ohio State University Extension
Vegetable Crops VegNet Newsl. Vol. 8, No. 31. October 17, 2001)

Animal Farm, WEB sites

Pastured poultry questions and answers
http://www.wisc.edu/cias/pubs/briefs/057.html With a grant from
the USDA Sustainable Agriculture Research and Education (SARE)
program, CIAS studied five farms (four in Wisconsin and one in
Minnesota) that raised pastured poultry in moveable pens. This
Research Brief addresses gross and net returns, labor requirements,
processing issues (fairly specific to Wisconsin), and other factors
that farmers should consider before raising pastured poultry.

Starting your own dairy farm
http://www.wisc.edu/cias/pubs/briefs/058.html >From 1996 to
1999, the UW-Madison Program on Agricultural Technology Studies
(PATS) and CIAS surveyed over 300 beginning dairy farmers across
Wisconsin and conducted in-depth interviews with 30 beginning
farmers. These results show that there are a variety of ways to start
a successful dairy farm. This Research Brief addresses a range of
issues that face beginning dairy farmers, including the wisdom of
starting out with management intensive rotational grazing and the
importance of off-farm work. It also includes start-up advice from
beginning dairy farmers in Wisconsin.

New England Veg Conference, Dec. '01

NEW ENGLAND VEGETABLE AND BERRY CONFERENCE AND TRADE
SHOW. Mark your calendars for December 11, 12 and 13, 2001!
That's when the 12th New England Vegetable and Berry Conference
and Trade show will take place, at the Sturbridge Host Hotel in
Sturbridge, Massachusetts, near the junction of I-90 and I-84. This
one-of-a-kind regional event should be attended by anyone with an
interest in commercial horticulture.
The 3-day educational program offers 4 concurrent sessions each morning and afternoon. There will be a total of 120 individual presentations! On Tuesday, December 11: the sessions cover strawberries, cole crops, tomatoes, weed management, labor, biotechnology, and trickle irrigation. On Wednesday, December 12 the sessions are on blueberries, peppers, sweet corn, bedding plants, greenhouse tomatoes, brambles, and cover crops. The sessions on Thursday, December 13 discuss cucurbits, fall ornamentals, alliums, lettuce and greens, cut flowers, food safety, biological controls and organic production. Contact: Frank Mangan (978) 422-6374, Vern Grubinger (802) 257-7967, fmangan@umext.umass.edu.

**Future of Our Food & Farms Summit, PA 11-01**

The 3rd Annual Future of Our Food and Farms Summit on Nov. 29 and 30, 2001 in Philadelphia, PA, is shaping up to be the best ever. The program is extremely interesting, and this year's Summit will be framed by four very special events. First, four Secretaries of Agriculture from Pennsylvania, Delaware, Maryland and New Jersey will keynote the opening session. Second, a pre-Summit Hunger Congress, put together by the Food Resources Alliance (FRA), with invited state and federal legislators, will highlight evolving public policies impacting hunger in our region. JoAnn Connelly President of the Greater Philadelphia Food Bank will moderate this session. Third, Thursday's dinner will be a feast of locally grown foods, put together by some of the region's top chefs, including Jill Horn, Delilah Winder, Jack McDavid, and Kevin von Klaus. Finally, with this year's Summit, we are initiating an annual award to be given to the person, organization, or business that has done the most to benefit the Mid-Atlantic food and farming system. For more information, contact: Meredith Stone 215-568-0830 o Ext.10 fmtrust@libertynet.org

**Other Upcoming Meetings**

November 29, First Annual Iowa Organic Conference will be held in Ankeny, IA; contact Margaret Smith, Practical Farmers of Iowa, (515) 294-0887
2001 Northeast Community Supported Agriculture (CSA) Conference
December 7-9, 2001, Frost Valley Conference Center, Claryville, New
York, For information contact: Beth Holtzman, organizer, E-mail
csaconference@together.net or call 802-229-1441.

December 7-9, Northeast Community Supported Agriculture
Conference will be held in Claryville, NY; contact Robyn Van En
Center for CSA Resources, Wilson College Center for Sustainable
Living, 1015 Philadelphia Ave., Chambersburg, PA 17201;
info@csacenter.org.

07-09 January, 2002 * INTERNATIONAL ADVANCES IN PESTICIDE
APPLICATION, Guildford, UK. Contact: AAB, c/o HRI, Wellesbourne,
Warwick, CV35 9EF, UK. E-mail: <Carol.AAB@hri.ac.uk>.

January 23-26, 2002, 22nd Annual Ecological Farming Conference
will be held in Pacific Grove, CA; contact Ecological Farming
Association, 406 Main St., #313, Watsonville, CA 95076; (831) 763-

August 21-28, 2002, "IFOAM 2002: Organic World Congress" will be
held in Victoria, BC, Canada; contact International Federation of
Organic Agriculture Movements, c/o Building 20, 8801 East Saanich
Rd., Sidney BC V8L 1H3, Canada; (250) 655-5662;