Warm dry conditions have continued across the region for the past two weeks with temperatures averaging 2 to 5 degrees above normal. Dry weather has been the rule over the past two weeks. The FAWN Weather Station in Immokalee recorded several light showers over the period. With the exception of a half an inch of rain, which fell on March 16, the total for precipitation for the rest of the period was only 0.12 inches of rain. The warmer weather and dry conditions are increasing the need for irrigation across the board. Most growers indicate that they are running their irrigation pumps around the clock in an effort to maintain adequate soil moisture for optimum plant growth. There have been several reports of growers having difficulty in irrigating. There have also been scattered reports of salt related problems in seep irrigated crops. Growers on drip systems have generally avoided such problems.

Daytime temperatures have ranged from the low to mid 80’s with nighttime temperatures ranging from the low-50’s to the mid-60’s. Several mornings have seen foggy conditions. The National Weather Service forecast calls for a 40 – 50% chance of rain through Saturday evening. The extended forecast calls the possibility of scattered afternoon showers on Sunday and Monday with the weather clearing and turning a little cooler on Tuesday.

Planting of most crops, including peppers and tomatoes has been completed. Major vegetables harvested during the week include potatoes, tomatoes, peppers, cabbage, cucumbers, snap beans, squash, sweet corn, and eggplant. Warmer temperatures have caused a general increase in insect pressure, while dry conditions have kept disease pressure light.

Thrips populations continue to rise across the area. Respondents are reporting that populations have reached threshold levels in many areas. The Florida Tomato Scouting Guide sets threshold levels at >5 thrips per bloom. Several growers report that populations are mobile, moving from field to field and are requiring continued efforts to keep them in check. Thrips have been reported in several crops including tomato, pepper, eggplant and cucurbits. On pepper and eggplant, the main concern is physical feeding damage to the fruit. With cucurbits, the greatest damage is in plant growing points.
The main thrips species being observed are Florida flower thrips – (Frankliniella bispinosa), although there have been scattered reports of melon thrips (Thrips palmi) as well. Growers are advised to maintain vigilance as the citrus crop is in full bloom at this time and we often see a dramatic increase in thrips pressure following the citrus bloom as populations migrate to nearby vegetable crops.

Moderate to high populations of aphids continues to be reported across the area. There are widespread reports of winged aphids present. Sizeable populations continue to be observed in several crops including eggplant, leafy greens, melons, pepper, potato, squash and tomato. Colony formation has been observed in a number of locations. Several growers are reporting some difficulty in obtaining satisfactory control.

Control of aphids is not particularly difficult if a few precautions are observed. It is necessary to select a recommended material for their control, but even more so, a thorough coverage of all the plant surfaces is mandatory. Aphids prefer the undersides of the leaves and young developing buds as feeding sites. Thus they are protected from much of the insecticidal spray unless it is aimed at these crevices and places. Even a few females left uncontrolled can quickly lead to the buildup new populations.

Aphids are particularly troublesome in cucurbits as they are implicated in the transmission of a number of viral pathogens. Spraying for aphid control is not an entirely effective in the management of number of mosaic viruses. Transmission of virus can occurs very quickly once aphids move in and begin feeding.

An effective option is to apply stylet oil. A light film of stylet oil on the leaf can greatly help reduce viral transmission. Stylet oil can be fairly effective when applications begin before the crop is infected and where you have thorough spray coverage. Thorough coverage combined with a weekly application schedule will help delay the onset of virus.

A number of reports indicate that armyworms pressure has picked up over the past few weeks. Most respondents indicate finding mostly southern armyworms, although there have been some scattered reports of problems with beet armyworms in pepper. Armyworms are active in tomatoes, peppers, cucurbits and a number of other crops. There have been a few scattered reports of tomato fruitworms and loopers as well.

Armyworms can be a severe pest in watermelons. If not controlled, larvae burrow directly into the melons, making them totally unmarketable. Careful scouting is essential to detect problems, but may be difficult once the foliage is fairly dense. Larvae hide on the calyx, in blooms, and under the melon along the soil line. It takes experience and patience to scout watermelons effectively.

When the crop is small, Bt insecticides are recommended for the control this pest and other worms. There are two key reasons.

First, it's absolutely essential to use insecticides that will not harm the bee population. Bees are required for cross pollination of melons and other cucurbits. Secondly avoiding "harsh" insecticides early in the crop will help preserve the beneficials that keep leafminers from getting out of hand.

After the crop is pollinated it may be necessary to use more harsh materials along with Bts. For younger worms after the crop is pollinated, synthetic pyrethroids are often used. For larger worms, Lannate is often the chemical of choice. With Bts, best control is often obtained with the two-strain products such as Xentari. These contain both the azawi and kurstaki strains of Bt. Some of the single-strain products that worked well a few years ago are now only effective under low pressure.

When using synthetic pyrethroids it is important to rotate between different classes of these products, avoiding the same class of pyrethroid back to back to help prevent the buildup of resistance in pest populations. Thorough coverage, which is a must, can be improved by putting crews in the field to turn back the vines before spraying. This is a high-labor, expensive operation, but it makes a difference in spray results.
Although pinworms are being widely reported across the area, most have been in traps and few problems have been seen in the fields. Where present, pinworm counts seem have leveled off with 5 or fewer moths/night/trap being reported. Growers should begin to apply controls once thresholds of 5 adults per trap per night are observed.

Whitefly populations remain generally low although several respondents have noted a slight increase in whitefly populations. There have been a few isolated reports of whitefly numbers reaching fairly high levels in some older tomato fields where counts of 10 or more per plant are not uncommon. Whiteflies are also building up in melons and cucumbers. In general, populations remain well below levels seen in previous years. It is important to remember that whitefly populations can develop rapidly at this time of year.

In addition to its ability to transmit TYLCV and other viruses, the rate of population growth is one reason the silverleaf whitefly has become such a notorious pest. On the right crop, the insect has such an explosive potential to reproduce that it often outpaces populations of natural enemies in the field.

Steve Castle, an USDA-ARS entomologist measured the population growth rate of the silverleaf whitefly. Single pairs of whiteflies in his study produced up to 20 to 25 progeny per day, averaging 440 offspring per pair during a 24-day period. Some pairs produced over 500 progeny during the period and reproduction continued beyond the end of the 24-day study.

Most reports indicate that leafminer pressure is fading out with onset of warm weather.

Spider mites appear to be on the rise in several crops. Several growers are experiencing problems with spider mites on eggplant, tomato, as well as melons, cucumbers and other crops. Occurrence is sporadic and damage is low to moderate in most cases.

Because mites can grow from egg to adult in five days during hot, dry weather, populations build rapidly. Since miticides often have little effect on eggs, they requiring multiple applications for effective suppression. Since a generation can mature and reproduce in as little as five days, repeat applications should be made every five days to target hatching eggs and break the reproductive cycle. Thorough coverage is also extremely important in mite control.

Broadmites are being reported in pepper. Occurrence is sporadic and damage low.

The rate at which mite populations can increase also demonstrates surprising speed. An average female spider mite lays about 100 eggs during her lifetime. Studies indicate that mites have the potential to expand their population seventy-fold in one generation.

Diamondback moths are being reported in crucifers. Damage has been light.

Pepper weevil numbers have reached high levels in some older plantings. Pepper weevils are being widely detected in traps and some respondents have noted the appearance of weevils in young pepper. Currently, however, no major problems are being reported where vigorous control programs are in place.

Stinkbugs and eggs are being reported in tomato from scattered locations across the area.

Respondents have reported the occurrence of powdery mildew in watermelon. Incidence is sporadic and damage low.
Powdery mildew is also widely present in zucchini and yellow squash particularly in older fields.
**Downy mildew** has been reported on *cucurbits* from several widely scattered locations across the area. Cucumber and muskmelon are the most susceptible of the cucurbits to downy mildew, caused by the fungus *Pseudoperonospora cubensis*, but the pathogen also attacks watermelon, squash, pumpkin, gourd, and other members of the Cucurbitaceae. Symptoms first appear as small, angular, yellow lesions on the upper side of the leaf. A white to purplish mildew may be observed on the lower side of the leaf during humid weather. As the lesions expand, their centers turn brown. Often the margins of diseased leaves curl upward. During favorable weather, leaf lesions coalesce and kill large areas of the leaf surface. This results in a stunting of the plant and a failure of the fruit to mature properly. Even those fruit, which reach maturity, may have an off-flavor. In severe cases, the entire plant will die.

**The fungus requires extended periods of wet weather and leaf wetness for the infection process.** A grower may expect a downy mildew outbreak when inoculum is present and when weather conditions are favorable for infection. Unlike some downy mildews, *P. cubensis* thrives in warm as well as cool temperatures provided there is sufficient moisture and a high relative humidity.

**Within the state of Florida, four risk areas for downy mildew have been designated:**

- **Area I**, Immokalee - Ft. Myers
- **Area II**, Leesburg - Wildwood - Ocala
- **Area III**, Levy, Alachua and Gilchrist Counties
- **Area IV**, North Florida (Including the Panhandle)

Generally, disease intensity is greatest in Area I and least in Area IV, with areas II and III being intermediate.

**In our area - Area I, downy mildew can occur throughout the year** on crops, weeds and volunteer plants in the field and ditch banks. If a freeze does not destroy these plants, inocula (spores) are present all year. Gummy stem blight also produces inocula on old vines when allowed to remain on the soil surface. Area I should be on a continual alert from emergence through harvest every year.

**It may be necessary to spray twice each week to maintain spray on new foliage.** When temperatures drop below 60 °F and dew periods are reduced, weekly spray schedules may be adequate because the rate of disease progress decreases and plant growth is reduced. Generally, downy mildew and gummy stem blight appear to be most intense from February to harvest in this area but control is difficult while either disease is ravaging a crop. Rather, control is most effective when the level of disease is maintained at a low level with a full-season spray program.

**Control of downy mildew is dependent on cultural practices, early detection and timely applications of fungicides.** It's a good idea to inspect fields regularly for any evidence of downy mildew or other disease problems. Early detection is essential for the proper control of foliar pathogens.

If fungicide sprays are delayed until disease severity is visible through a windshield of a car or pickup truck, it is difficult to minimize diseases such as downy mildew or gummy stem blight. Both of these diseases will begin as just a few spots on the leaves or stems but after a period of time their severity increases rapidly. If your spray program begins after the appearance of disease with a non-therapeutic fungicide, you can expect an increase of visible disease up to 7-10 days later because of infections already present.

If weather conditions become favorable for the development of downy mildew, begin protective fungicide applications and continue on a 4-7 day interval. Protective fungicides such as mancozeb or chlorothalonil also will protect the plants from other foliar diseases (anthracnose). **Copper-based fungicides** are not typically recommended, as they can be toxic to certain watermelon cultivars. If downy mildew is already present in the field, it is advisable to use a systemic fungicide (metalaxyl) to arrest disease development. This type of fungicide will stop lesion expansion once infection has occurred. A combination of chlorothalonil and metalaxyl has been
shown to have a positive synergistic effect in controlling downy mildew. Alliette and Quadris have also given good results in halting infections.

**Late blight activity on potato appears to have abated.** Incidence is sporadic and damage is low. It seems to have popped up in several locations around the same time several weeks ago. Growers have responded with an aggressive control program and *little further spread* of the disease has been *noted.*

**TYLCV remains low.** Most growers are still seeing only isolated occurrences of *single infected plants here and there.* Several respondents have noted a slight increase in the incidence of TYLCV. **Incidence** remains well below 1% in most cases. However, whereas a few weeks ago it was necessary to cover 50 – 100 acres to find one infected plant, it is now possible to find one infected plant in every 5 – 20 acres in a number of locations. Grower complacency resulting in any appreciable relaxation of control efforts in *could still result in significant increases* in the incidence of *this disease* in the future.

**Early blight** has been reported on tomato. **Incidence and occurrence is low.**

Some bacterial leaf spot activity is being reported across the area. **Incidence and damage is low and occurrence patchy.** In addition, there have been a few isolated reports of bacterial speck on tomato. In general, however, problems with *foliar diseases* on tomato and pepper have been *minimal.*

**Low levels of alternaria leaf blight** and *gummy stem blight* has been noted in watermelon. **Occurrence is sporadic and limited. Incidence is low.**

**Recent work** by Dr Don Hopkins at the UF/IFAS Mid-Florida Research and Education Center indicates **good control of gummy stem blight using strobilurin fungicides, such as Quadris.** In trials, Quadris alternated with Bravo provided better control of gummy stem than did traditional control methods such as Bravo and Benlate plus Manzate. Indications are that the new *strobilurin fungicides* promise to be *valuable new tools in the control of gummy stem blight in watermelon.*

Growers continue to report high incidence of *fusarium crown rot in some tomato fields* particularly, where fusarium has traditionally been present.

**Fusarium wilt** has been reported on watermelon in scattered locations across the area. Fusarium wilt, caused by *Fusarium oxysporum f. sp. niveum* is one of the most important diseases of watermelon. A distinct race of the fungus (*Fusarium oxysporum f. sp. melonis*) causes a similar type of wilting on muskmelon.

**The disease may affect plants in all stages of growth.** Damping-off is common on young seedlings. Young plants may develop a soft, cortical rot, which results in chlorotic leaves and stunting. **The most common symptom on older plants is wilting.** On fumigated beds and in double crop situations, this often occurs as the plants begin to run of the beds and roots encounter untreated soil. Generally, the wilting process begins in one or more lateral vines of the plant. The leaves become flaccid, wither, and turn brown. Gradually, the wilting progresses until the entire plant is killed. **Vascular discoloration often is associated with wilted vines.** This is seen by slicing vertically through a vine near the soil surface. Look for a yellow-brown discoloration in tissue directly beneath the outer layer of the vine. A white fungal growth also may be formed at the base of the dead vines.

**Fusarium wilt is a major limiting factor for watermelon production in Florida.** The disease-causing fungus may be introduced into a field on contaminated seed, and the movement of plants, soil and equipment. Once established, the fungus can survive in the soil for many years. Because the fungus can survive in soil for long periods, it is often impractical to control the disease through crop rotation. **The most satisfactory means of controlling fusarium wilt is the use of resistant varieties.** Use only cultivars with resistance in fields where
wilt has been a problem. Nearly all commercial varieties have some degree of resistance to Fusarium wilt and anthracnose. It should be understood that resistance to these diseases is not complete; some plants within a population are susceptible and resistance may be overcome under high levels of disease pressure.

**Downy mildew has been reported on crucifers** in several locations. **Incidence and damage is low.**

**Up Coming Meetings:**

**March 22, 2000**

Vegetable Growers Meeting – 5:30 – 7:30 PM  
“Management of Cucurbit Diseases” and “An Overview of Phytophthora Blight of Pepper and Eggplant”  
Southwest Florida Research & Education Center, Immokalee  
For more information, contact Gene McAvoy at 941-674-4092

**March 25, 2000**

Utilizing Organic Materials in Horticultural Production Systems Workshop  
10 AM – 4:00 PM  
Southwest Florida Research & Education Center, Immokalee  
2 CEU and 5 CCA credits will be offered  
Reservations Required – Contact Pam Watson at 941-658-3405

**April 19, 2000**

Vegetable Growers Meeting – 5:30 – 7:30 PM  
“An Overview of Nutrient Supply through Foliar Applications” and “Foliar Nutrients and Bio-Stimulants in Vegetable Crops”  
Southwest Florida Research & Education Center, Immokalee  
For more information, contact Gene McAvoy at 941-674-4092

**Web Sites:**

**EPA Home Page** – EPA is moving ahead rapidly on pesticide reviews under FQPA – stay abreast with what is happening at [http://www.epa.gov/pesticides/op/status.htm](http://www.epa.gov/pesticides/op/status.htm) The organo-phosphates are currently under review by the EPA.

**Photo Gallery of Cucurbit Foliar Diseases** – This site has some good photos and diagnostic tips for most of the more common cucurbit diseases including downy mildew, anthracnose and gummy stem blight. [http://www.ces.ncsu.edu/depts/ppcucurbit/disease/Image.html](http://www.ces.ncsu.edu/depts/ppcucurbit/disease/Image.html)

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Wishing you all a Safe and Happy St Patrick’s Day
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The SW Florida Pest and Disease Hotline is compiled by Gene McAvoy and is issued on a biweekly basis by the Hendry County Cooperative Extension Office as a service to the vegetable industry.

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