



SOUTH FLORIDA VEGETABLE PEST AND DISEASE HOTLINE

April 18, 2018

The first half of April brought mostly warm dry weather with lows in the 60's and highs in the mid to upper 80's. A frontal passage this weekend caused temperatures to dip over the past few days.

The dry pattern which has persisted over the past few months has led to the development of moderate drought conditions over parts of South Florida Many areas reported less than an inch of rain for the period with the exceptions of Balm (2.04 inches), Belle Glade (1.59 inches) and Okeechobee, which reported a whopping 3.98 inches

FAWN Weather Summary

Date	Air Temp °F		Rainfall (Inches)	Ave Relative Humidity (Percent)	ET (Inches/Day) (Average)
	Min	Max			
Balm					
4/2 – 4/17/18	47.55	89.29	2.04	73	0.14
Belle Glade					
4/2 – 4/17/18	51.94	94.08	1.59	78	0.15
Clewiston					
4/2 – 4/17/18	50.16	92.73	0.77	76	0.16
Ft Lauderdale					
4/2 – 4/17/18	58.06	91.85	0.89	73	0.17
Homestead					
4/2 – 4/17/18	52.65	90.57	0.78	77	0.16
Immokalee					
4/2 – 4/17/18	45.90	95.63	0.46	75	0.16
Okeechobee					
4/2 – 4/17/18	45.41	89.69	3.98	89	0.15
Wellington					
4/2 – 4/17/18	55.74	93.25	1.59	77	0.16

When in doubt, scout!

Drought stress has resulted in widespread blossom end rot in susceptible crops and is responsible for poor pollination and quality issues in other crops.

The vegetable deal is winding down quickly across South Florida spurred by plummeting prices for tomatoes and peppers. Spring tomatoes are coming in in the Manatee Ruskin area and watermelon volumes are picking up around South Florida. Reports indicate many fields have been picked only once and growers have backed off spraying because of low prices.

The National Weather Service forecast indicates that surface high pressure will build over the region behind the cold front, which will keep the area dry for most of the week. The drier air mass will also help moderate temperatures a bit with some 40s and 50s returning to portions of South Florida during the overnights this week.

Late in the week, the next low pressure system to bring a front through the area, will be our next rain chance for a good portion of the area. While it is still early, thunderstorms are possible with this front if convective support occurs.

For additional information, visit the National Weather Service in Miami website at <http://www.srh.noaa.gov/mfl/newpage/index.html>

Insects

Whiteflies

Around SW Florida, whitefly numbers have been variable but have increased to high population densities in some areas. Growers and scouts report finding nymphs and pupae and are seeing the first signs of irregular ripening in some tomato fields.

Growers and scouts in Palm Beach County are battling whitefly in tomato and eggplant. Growers are also fighting whitefly in squash.

In Homestead, whiteflies have reached the highest numbers so far this season along with the resulting high incidence of tomato yellow leaf curl virus and bean golden mosaic virus.

Respondents indicate that whitefly activity remains mostly low in the Manatee Ruskin area.

Table 1. Systemic insecticides applied to soil for whitefly control

Common name	Mode of Action	Trade Names	Rates
Imidacloprid	4A	Various	Check Label
Thiamethoxam	4A	Platinum 75 SG	1.66 - 3.67
	4A	Venom 70%	5 - 7.5 oz./ac
		Scorpion 35 SL	9 - 1 0.5 fl oz./ac
		Certador 10%	32.5 - 47.5 fl oz./ac
Flurpyradifuron	4D	Sivanto 200 SL	21-28 fl oz./ac
Verimark	28	Verimark 18.7%	5-10 fl oz./ac

Efficacy Ratings for Insecticides and Miticides on Tomato

MOA	Active Ingredient	Whiteflies	Other pests controlled			
		Whiteflies	Southern Armyworm	Spider mites	Stinkbugs	Leafminer
4A	dinotefuran	E**			G	
4A	imidacloprid	E**				
4A	thiamethoxam	E**			G	
4D	flupyradifurone	E**				
23	spiromesifen	E†		E		
23	spirotetramat	E†		G		
7C	pyriproxyfen	E†				
28	cyantraniliprole	E**	E			E
1B	malathion	G*				
3A	beta-cyfluthrin	G*	F		G	
3A	bifenthrin	G*			G	
3A	esfenvalerate	G*	G			
3A	fenpropathrin	G*	F		F	
3A	lambda cyhalothrin	G*	F			
3A	permethrin	G*	G			
3A	zeta-cypermethrin	G*	G		F	
4A	acetamiprid	G				
9	pymetrozine	G†				
16	buprofezin	G†				
21 A	fenpyroximate	G		G		
4A	clothianidin	F**				
Unk.	horticultural oil	F†		G		
Unk.	Azadiractin	F†				
Unk.	Soap, insecticidal	F†				

* OP+Pyrethroids tank mix. † Effective primarily against nymphs ** Most Effective as a drench. Check labels before using any pesticide.

For more whitefly management tips – see: **Management of Whiteflies, Whitefly-Vectored Plant Virus, and Insecticide Resistance for Vegetable Production in Southern Florida** - <http://edis.ifas.ufl.edu/in695>

Thrips

Thrips remain active around SW Florida but most appear to be Florida flower thrips (*Frankliniella bispinosa*). This is typical this time of year as these thrips come off the waning citrus bloom. FFT will not damage pepper except in high numbers (30 per bloom or so), and may even be considered beneficial as they provide food for minute pirate bugs that help control pest thrips species. For this reason, populations of pest species are often seen to resurge after sprays of pyrethroids or other broad-spectrum insecticides. Therefore, it is usually counterproductive to spray for thrips when only FFT are present.

Dr Phil Stansly Entomologist at UF/IFAS SW Florida Research and Education Center notes that melon thrips have been a problem in our region in recent years, larvae and adults can be found feeding on foliage as well as in blooms, so thrips feeding on foliage would be of concern. The other pest species in blooms to watch out for are western flower thrips (WFT, *Frankliniella occidentalis*) and common blossom thrips (CBT, *F. schultzei*). CBT is usually dark in color and thus easily distinguished from most other thrips likely to be in blooms of fruiting vegetables. WFT is yellow in color and harder to distinguish from FFT or melon thrips). WFT can damage pepper directly and both it and CBT will transmit tospoviruses like tomato spotted wilt virus, tomato chlorotic spot virus and groundnut ringspot virus.

Growers and consultants are welcome to bring in samples of blooms in Ziploc bags or vials, with or without alcohol to the Entomology lab at SWFREC for analysis of thrips species present.

On the East Coast, thrips pressure is variable ranging from low to high with more southern areas under heavy pressure. Moving north to Loxahatchee and into Martin County thrips number drop off. Cucumber, eggplant, pepper, and tomato in Palm Beach County are all under some pressure.

Around Hillsborough County, thrips appear to be slowing down.

Late season Homestead crops remain under intense thrips pressure, especially melon thrips, which are causing major problems in snap beans.

Dr Dak Seal recommends that to avoid melon thrips problem growers need to follow the following instructions:

- a) Do not use insecticides unless you are sure about pest status of the thrips on your crop. In order to be sure, get your thrips identified by the nearest available thrips authority (extension agents, scouts, researchers, etc.). Some thrips can be harmless or even beneficial.
- b) Once the species is confirmed to be a harmful one, immediately plan your IPM program.
- c) Scout fields to confirm the level of infestation- if population is below threshold level, use environmentally compatible products, such as Trilogy, Neemix, Requiem, and Grandevo. These products can be used alone or in combination (Trilogy + Requiem or Neemix + Grandevo).
- d) If thrips populations are increasing, use Radiant in combination with Tolfenpyrad or Movento followed by Closer/Exirel.

All of these above-mentioned insecticides will provide suppression of thrips populations but none of them is silver bullet.

Aphids

Respondents on the East Coast indicate that more aphid numbers are building pepper and in some eggplant. Despite increases in aphid numbers, virus remains very low in squash at this time.

Cabbage aphids are showing up in some crucifers around South Florida.

Around SW Florida, aphids are widespread, mostly in pepper and cucurbits. Scouts report that control has been problematic in places.

Aphids are present in mostly low – moderate numbers on susceptible crops in the Homestead area.

Sulfoxflor (Closure) is probably the best insecticides to control aphids.

Pepper Weevil

On the East Coast, respondents indicate that pepper weevil numbers are increasing in some older pepper but note it is not significant due to age of crop which is nearly finished. Growers report battling pepper weevil in some eggplant adjacent to old pepper fields.

Around Immokalee, pepper weevils are increasing and are present in most pepper fields.

Reports from Miami-Dade County indicate pepper weevil is a major problem and serious infestations can be observed in all plantings irrespective of pepper varieties and location. Dak Seal reports that Actara, Vydate, the diamides and pyrethroids can be used in a program to manage this pest.

Since adults will migrate readily from old fields to new plantings, populations generally build up during the season so that populations are greatest in later spring plantings.

Commercially available pheromone traps may aid in early detection. Fruit and flower buds should be examined for damage and fallen fruit and buds examined for presence of larvae.

Infested fruits can be recognized before they fall by the yellow calyx and the presence of oviposition punctures that look like small dimples. Hot peppers like Jalapeno and Serrano's are often the first peppers to be affected. Fruit and flower buds should be examined for damage and fallen fruit and buds examined for presence of larvae. If possible, all damaged and fallen fruit should be removed and destroyed.

Chemical control is difficult because all stages but the adult are protected within the fruit, so that only the adult weevil is vulnerable to insecticides. Frequent sprays may be necessary starting in the initial stages of infestation in order to avoid unacceptable levels of damage.

Spraying needs to commence at the first sign of weevils or with flowering in fields with a history of problems Vydate is back on the market, has been the standard control, and has given good results when sprayed weekly.

Other products that have performed well in trials include Capture (bifenthrin), Kryocide (cryolite) and Actara (thiomethoxam). Unfortunately, applications are limited to two per season and growers are still trying to work out the timing of applications to achieve the best results.

Many of the currently labeled materials are difficult to work into an IPM program once plantings begin to be harvested due to the 7-day PHI in force for all of them. This is particularly true for hot peppers, which are often harvested multiple times during the course of a week. Consult UF/IFAS recommendations for currently labeled insecticides for pepper weevil control in Florida vegetables.

In addition to chemical controls, a complete IPM approach is recommended for pepper weevil management. Adjacent or nearby sequential plantings should be avoided. Sanitation is important. Crops should be deep plowed immediately following harvest and after treating with insecticide to reduce adult movement into nearby fields and to reduce survival over the summer. A crop free period is essential in helping to reduce populations between crops. Crop destruction is probably the best option for older plantings where weevils become unmanageable.

Spidermites

Respondents in Palm Beach County report that mites are building with recent dry conditions and are problematic in some eggplant, sweet corn, and beans.

Growers and scouts report that spidermites are flaring up in a number of locations around SW Florida.

Around Homestead, two-spotted spider mites are present on tomato, beans, squash and sweet corn.

Mites remain quiet in the Manatee Ruskin area.

Leafminer

Leafminers continue to be an issue on tomatoes and cucurbits in the Manatee Ruskin area.

Around SW Florida, growers and scouts report that leafminers are hit and miss depending on location.

Respondents indicate that leafminers are not factor in most East Coast locations.

Leafminer numbers are high around Homestead on a variety of crops.

Cyromazine (Trigard) alternated with abamectin (Agrimek) are effective against leafminer in tomato. Both of these products have limited crop registrations and must not be used on unregistered crops. Spintor (Spinosad) and Radiant (Spintoram) have also given good results and are labeled on a wide range of crops. Some other materials that may be used to conserve beneficials include azadirachtin (Neemix) and insecticidal oils. Both products are approved for use by organic growers as is Conserve (spinosad).

Newer chemistries, which have added to the grower's arsenal of control, include Coragen (rynaxpyr), Exirel and Verimark (cyazypyr) which have given good results and have greatly reduced leaf miner pressure on many farms.

Consult UF/IFAS recommendations for currently labeled insecticides for leafminer control in Florida.

Field sanitation is another important control tactic. Weeds and abandoned crops can serve as reservoirs for this pest. After harvest, crops should be destroyed as soon as possible to avoid having them serve as reservoir for new infestations.

Worms

Around Immokalee, growers and scouts report worm pressure is increasing in a number of places especially where growers have backed off on spraying due to low prices. New hatches of beet, fall and southern armyworms, loopers, melonworms and a few pinworms are being reported depending on the location.

Producers on the East Coast report that worm pressure remains mostly low. Low numbers of fall armyworms are present in sweet corn in the Glades.

Diamondback moth remain active in many locations where brassicas such as cabbage, cauliflower, collards, kale, arugula, and broccoli are still present. They have been especially problematic where crops are grown back to back in succession.

Fall armyworm, beet armyworm and melonworms remain active around Homestead.

Lesser corn stalk borer numbers remain low around Belle Glade but are increasing around Clewiston.

Broad Mite

Mostly low numbers of broad mites remain present in all areas of South Florida.

Stinkbug

Growers and scouts report that with warmer temperatures, stinkbugs are spiking up in some locations and growers are having to treat especially in places where growers have been using Exeril and very little pyrethrins are being used. Stinkbugs have also been problematic in some organic fields.

Diseases

Powdery Mildew

Growers and scouts report that powdery mildew is increasing in watermelon fields around Southwest Florida and is drying up older leaves . Scouts report finding lesions on rinds in some locations. Powdery mildew is high in squash and is showing up in some older pepper as well.

Powdery mildew is widely present on squash around Palm Beach County but remains low in cucumber.

Dr Rick Raid Pathologist at EREC reports seeing some powdery mildew on lettuce in the EAA this spring, due to the drier conditions. He notes that he has only seen this disease a few times over the years. Growers should be aware that fungicides that are primarily downy mildew fungicides might not control powdery mildew, should it become widespread.

Growers and scouts indicate that powdery mildew is widespread in beans and cucurbits around Homestead including squash and bitter melon.

In watermelon, powdery mildew develops rapidly under favorable conditions. Symptoms of powdery mildew of watermelon appear as yellow blotches on the oldest leaves first. If untreated the fungus quickly spreads to completely affect the entire leaf. As the disease progresses these blotches become bronzed and turn dark brown or purplish. Eventually the leaf dies and has a crisp texture.

White masses of sporulation that are frequently seen with other powdery mildews are not commonly seen with the powdery mildew of watermelon. In some cases, affected leaves may display the typical yellowing, bronzing, and a fair amount of white powdery fungal growth. Often little or no white powdery mycelia are present and in these cases, microscopy may be necessary to find a limited amount of the powdery mildew fungus in the yellowed areas. In some instances, powdery mycelia may be absent on the leaves but present on the fruit

Powdery mildew can cause fruit to be smaller in size, fewer in number, less able to be successfully stored, sun scalded, incompletely ripe, and have a poor flavor.

Growers who wish to minimize the risk of yield loss to powdery mildew should make preventative fungicide applications and scout fields regularly.

Fusarium

Fusarium is widely present on tomato and watermelon around SW Florida and appears to be increasing in severity in many places and taking out some older tomato. Both Fusarium crown rot and race 3 is being reported in tomato. In watermelon, vines are exhibiting classic fusarium symptoms beginning with one runner wilting along with some yellowing and vascular staining of vines.

Around Hillsborough County, Fusarium R3 is progressing rapidly in tomato fields with a history of the disease.

Fusarium wilt is a highly destructive disease of tomato that is caused by the fungus *Fusarium oxysporum f.sp. lycopersici*. There are currently three known races (1, 2 & 3) of the fungus. Race 3 is relatively new to Florida and has been identified in several commercial fields where varieties resistant to races 1 and 2 have developed devastating Fusarium wilt symptoms.

The fungus penetrates root tissue, especially through wounds caused by cultivation or other damage, invading the xylem and eventually extending throughout the plant. It then grows up through the plants' vascular system into the stem. Plants can be stunted if infected when young. On older plants, symptoms often begin as a yellowing and wilting of lower, older leaves and branches. Symptoms progress up the plant as the yellowed leaves turn brown. Wilting frequently occurs on only one side of the plant and may initially occur during the warmest part of the day, and plants appear to recover at night. Symptoms often first appear during fruit sizing. Fruit set and size can be reduced.

Eventually the entire plant wilts and usually dies or it may persist in a weakened state. Yield losses may become extensive as the disease progresses.

As a diagnostic aid, the vascular tissue of the stem of heavily infected plants typically is discolored reddish-brown and may be observed by slicing open the lower stem. In some cases, abnormal amounts of adventitious roots may occur above the infected region.

The Fusarium wilt fungus is able to survive in the soil for long periods of time by forming spores, thick walled reproductive structures.

Use resistant tomato varieties. Resistant varieties are common for Race 1, and many are also resistant to Race 2. Fusarium wilt race 3 has a narrow host range.

Fusarium is long-lived and even rotations of 7 years or more will not completely remove the fungus from the soil.

Other less effective means of control, that have been tried include soil pasteurization with steam or fumigants, raising low pH soils to 6.5 - 7.0, using nitrate nitrogen instead of ammoniacal nitrogen and even adding mycorrhiza and organic matter to the soil.

Fusarium wilt of watermelon is common problem in Florida where resistant varieties are not used but it may occur to some extent even when resistant varieties are used. Fusarium wilt is caused by the fungus *Fusarium oxysporum f.sp. Niveum*.

Typically, the first noticeable symptom is that one side of a plant wilts. This one-sided wilt commonly occurs three to four weeks after transplanting. In older plants, there is marginal yellowing progressing to a general yellowing of the older leaves, and wilting of one or more runners. In some cases, sudden collapse occurs without any yellowing of the foliage.

Fusarium wilt is difficult to manage. The best control for Fusarium wilt of watermelons is the use of resistant varieties coupled with crop rotation. Long rotations (5 years or more is recommended) may lessen the survival rate of the fungus spores in the soil and decrease the severity of symptoms. Crop rotation is not generally very effective because chlamydospores survive so long in the soil and the pathogen can survive in or on the roots of symptomless carrier plants.

Commercially available grafted watermelon plants (grafted on to a fusarium resistant rootstock such as squash or gourd) have shown good results in situations where fusarium and other soil borne disease are a problem.

Trials with Proline (Prothioconazole) and other fungicides have shown mixed results for control of Fusarium in watermelon.

Downy Mildew

Downy mildew has been showing up on a wide variety of crops around South Florida including basil, crucifers, cucurbits and lettuce. Growers and scouts report that drier conditions over the past few weeks seems to have slowed disease progress.

Downy Mildew of Cucurbits

Growers and scouts report that downy mildew caused by the oomycete *Pseudoperonospora cubensis*, is widely present squash, cucumbers, muskmelons, and other cucurbits around South Florida.

Leaf symptoms may be used to diagnose downy mildew in the field in some cases. On cucurbits other than watermelon, small yellowish spots occur on the upper leaf surface initially away from the leaf margin. Later, a more brilliant yellow coloration occurs with the internal part of the lesion turning brown. Lesions are usually angular as leaf veins restrict their expansion. When the leaves are moist, a downy grayish fungal growth may be seen on the underside of lesions.

On watermelons, yellow leaf spots may or may not be angular and later turn brown to black in color. On watermelons, an exaggerated upward leaf curling occurs that growers sometimes liken to a dead man's hand.

Since nighttime temperatures between 55° and 75°F and relative humidity above 90%, provide ideal conditions for infection, cucurbits planted in South Florida are always at risk from downy mildew

Control of downy mildew on cucurbits is achieved primarily by the use of resistant varieties and/ or fungicide spray programs. Fungicide sprays are recommended for all cucurbits.

Squash, cantaloupe, and non-resistant cucumber varieties are very susceptible and should be sprayed every five to seven days. If cucurbits are planted close to established fields infected with downy mildew, a spray program should be initiated as soon as the first true leaves are present.

Spray programs for downy mildew are most effective when initiated prior to the first sign of disease since once a planting becomes infected; it becomes more and more difficult for fungicides to control downy mildew.

A wide range of oomycete specific fungicides is available for the control of downy mildew depending on the crop. Use of Bravo should be avoided on watermelon after fruit set as it may increase the risk of sunburn. Consult UF/IFAS recommendations for currently labeled fungicides for downy mildew control in Florida.

Lettuce downy mildew

Lettuce downy mildew, caused by *Bremia lactucae*, remains active in the Glades.

Growers are advised to be on a consistent preventative program using mancozeb and a phosphite.

Now that the disease is present, growers should also consider working in some of the more specific fungicides with translaminar or systemic activity such as Revus, Zampro, Orondis, Ranman, Reason, Forum, Presidio, Previcur flex, Aliette, etc. Growers should check with their suppliers and read the label carefully before using for plant back, use patterns, and rates.

Blue Mold

Dr Richard Raid, Pathologist at the UF/IFAS EREC reports diagnosing blue mold on spinach (aka downy mildew of spinach) in the Glades for the first time in many years. Blue mold is caused by the fungus-like organism *Peronospora farinose* f. sp. *Spinaciae*.

Symptoms first appear as pale yellowish spots with a gray to purple downy growth on leaf undersurfaces. This is most apparent during wet weather. Infections may be scattered or numerous, but individual lesions often coalesce. Severely infected plants are stunted or die.

Dr Raid notes that given the dry conditions in the Glades, this may not be a major issue in our area but could be of concern to growers in the Hastings area.

Late Blight

Late blight continues to creep around SW Florida on both tomato and potato with some new lesions being reported but has not emerged as a significant factor this season.

Growers and scouts in the Wimauma area report that late blight activity has slowed down and mostly dried up on potato and tomato.

Currently, fungicides are the most effective means of controlling late blight and will remain the primary tool until cultivars with resistance to this disease become available. Fungicides slow the rate at which the disease develops in the field by creating a protective barrier on the foliage.

Just applying a chemical, however, does not necessarily equate with effective disease control. Relative effectiveness of a product, coverage, and timing must be factored into the equation for maximum benefit.

Numerous fungicide products are registered for late blight control. Protectants, as the name implies, protect foliage from infection by spores. Protectant chemicals must be well distributed over the leaf surface and must be applied before spores land on leaves. They are ineffective against established infections.

PROTECTIVE applications of chlorothalonil are your first line of defense for managing late blight... Timing is critical - applications must be made when conditions are conducive for disease development and before infection occurs!!!

Consult current UF/IFAS recommendations for all labeled fungicides for the control of late blight in Florida. Go to for the most recent update: <http://edis.ifas.ufl.edu/pdffiles/cv/cv13700.pdf>.

See table of labeled fungicides below:

Fungicides for Late Blight		
Product Name	Brand	FRAC Number
chlorothalonil	many brands	M5
maneb/mancozeb	many brands	M3
cyazofamid	Ranman	21
cymoxanil	Curzate	27
strobilurins	Quadris, Cabrio, Flint	11
fluopicolide	Presidio	43
famoxadone + cymoxanil	Tanos	11 + 27

Product Name	Brand Name	FRAC Number
mandipropamid	Revus (fruiting vegetables)	40
Mandipropamid + difenoconazole	Revus Top (potatoes & tomatoes)	40 + 3
Dimethomorph	Acrobat, Forum	40
mefenoxam**	Ridomil – Note Ridomil (mefenoxam alone) does not have a label claim for late blight control as either a soil or foliar applied product – these claims are only on the premix products – see below	4
Mefenoxam + Chlorothalonil	Ridomil Gold Bravo (potatoes & tomatoes)	4 & M5
Mefenoxam + Mancozeb	Ridomil Gold MZ (potatoes & tomatoes)	4 & M3
propamocarb	Previcur Flex	28
zoaxamide + mancozeb	Gavel	22 + M3
ametoctradin + dimethomorph	Zampro	40 + 45
Oxathiapiprolin + Chlorothalonil	Orondis Opti (potatoes & tomatoes)	U15 & M5
Oxathiapiprolin + Mandipropamid	Orondis Ultra (potatoes & tomatoes)	U15 & 40
Consult current UF/IFAS recommendations for labeled fungicides for the control of late blight.		
** resistance documented in many races		

Reports indicate that bean red node is showing up on snap beans around Belle Glade. Bean red node is caused by a member of the genus Ilarvirus and is also known as Tobacco Streak Virus.

In beans, red node infection causes a reddish discoloration of nodes at the point of attachment of leaf petioles to stems. In severe cases, infected plants will flex or break at a discolored node. The veins and veinlets of infected leaves exhibit a red to reddish-brown streaking. Red to reddish-brown concentric rings form on pods which become shriveled or puffy and do not produce seeds. Plants can be severely stunted and killed by the virus.

Tobacco Streak Virus has also been reported in escarole and endive in the Glades. Tobacco streak virus (TSV) is reported from over 26 countries in the world, and has wide host range infecting more than 200 plant species. In addition to beans, other known hosts of the virus include cowpea, cucurbits, sweet clover, tomato and a number of weeds such as wild mustard and thistle.

Tobacco streak virus (TSV) or red node is efficiently transmitted vectored in fields by several species of thrips including western flower thrips, *Frankliniella occidentalis*, and onion thrips, *Thrips tabaci*. Infections typically exhibit a border effect with higher rates on infection at field margins.

Control of TSV is difficult. Chemical controls have not been developed for red node. Thrips control is probably ineffective but maintaining insect control programs is advised even though controlling the vectors alone will not provide sufficient control of TSV

The primary controls for this disease are mostly cultural. It is always wise to use virus-free seed and to control weed hosts. No biological control strategies have been developed for red node.

Good ditch bank weed management and growing beans in large tracts to minimize border to field area ratio are the most effective means of controlling this disease. Typically, this requires advanced planning. Once beans are in the ground, there is little that can be done, so keep this in mind for next season.

Northern Corn Leaf Blight and Southern Corn Leaf Blight

Northern and Southern Corn Leaf Blight are both present in the Glades and will probably remain so throughout the next several months. Northern corn leaf blight caused by the fungus *Exserohilum turcicum* is one of the most important sweet corn disease in southern Florida causing significant losses some years. Southern corn leaf blight (SCLB) is a fungal disease of corn caused by the plant pathogen *Bipolaris maydis*.

Initial symptoms of the disease include yellow spots that develop on the foliage. These enlarge to form tan or straw-colored dead areas about 4 to 6 inches long and one half inch wide. NCLB produces a long, elliptical lesion, while those of southern corn leaf spot tend to be oblong and much smaller than those produced by NCLB. Southern blight lesions are also lighter in color (light tan to brown), and have parallel sides rather than the tapering sides of lesions caused by *E. turcicum*.

Both diseases move from the lower canopy to the upper canopy. Fungal sporulation may be observed with a hand lens on foliar lesions following periods of high humidity. When severe, lesions may become so numerous that they coalesce and turn the entire leaf necrotic.

Spores are spread by rain and wind and may be carried long distances by the wind. Lesions can produce spores in as little as one week, allowing NCLB to spread much faster than many other corn leaf diseases.

Disease development is favored by heavy dews, frequent showers, high humidity and moderate temperatures

Resistant varieties are available for both diseases and should be considered, particularly for spring plantings.

Fungicide application can effectively control these diseases when applied at the right time. Fungicide should be applied when lesions first become visible on the lower leaves or when disease is reported to be in the area.

Triazoles and strobilurins both provide control, with some pre-mixes giving superior control. These products should be used with a broad-spectrum protectant to minimize development of fungal resistance.

Use EDBC fungicides such as mancozeb as a protectant before disease is present. Apply 4- 6 sprays on a 5 – 7-day basis. Use a surfactant/sticker as corn leavers are waxy and spray tends to run off. Rotate with a stobulurin such as Headline etc. As corn matures or disease becomes present, rotate between triazoles such as Folicur, Monsoon, Propimax etc and strobilurins or premixes of the two.

Consult UF/IFAS recommendations for currently labeled fungicides for northern and southern corn leaf blight control in Florida.

Target Spot

Target spot is starting to show up and is on the rise in tomato in the Manatee Ruskin area.

Around Immokalee, target spot has flared in some tomato fields due to growers having reduced spraying in face of poor markets.

Target spot remains mostly low around Palm Beach County

Bacterial spot

On the East Coast, respondents indicate bacterial spot activity has slowed dramatically.

Around Southwest Florida, bacterial spot continues to move in some tomato and susceptible pepper varieties.

In the Manatee/Ruskin area, bacterial spot is patchy in occurrence and incidence is low.

Tomato Yellow Leaf Curl Virus

Mostly low levels of TYLCV are also being reported around SW Florida and is increasing in some fields but given the late stage of the crop is unlikely to be of major consequence.

Around Palm Beach, growers and scouts are reporting a few TYLCV hotspots where young planting are adjacent to older fields or you-pick operations otherwise TYLCV remains mostly low.

TYLCV is widespread around Homestead as the tomato crop winds down there.

Cucurbit Leaf Crumple Virus

Crumple leaf virus has been reported on squash and in green beans in the Homestead area.

Around SW Florida, cucurbit crumple leaf virus is increasing in a few watermelon fields.

Squash Vein Yellowing Virus

There have been some unconfirmed reports of Squash Vein Yellowing Virus aka watermelon vine decline showing up on watermelons in a few places around Immokalee.

Papaya Ringspot Virus

Some papaya ringspot virus (mosaic) is present on watermelon around South Florida.

Tomato Chorotic spot virus.

There have been a few isolated reports of tomato and pepper plants showing TCSV symptoms in Palm Beach and Miami Dade County.

Dr Shoan Zhang, plant pathologist at TREC advises that TCSV was detected in green bean plants in a greenhouse in August-September 2017 where tomato plants were grown and infected with TCSV.

He notes that this poses a potential threat because of the large acreage of beans in South Florida.

News You Can Use

MARCH 2018 WEATHER SUMMARY

Dry Pattern Persists - Drought Conditions Parts of South Florida

April 3rd, 2018: The dry pattern that became established across South Florida early in 2018, continued in earnest in March. Many areas received less than an inch of rain for the entire month, with parts of northern Miami-Dade County receiving less than a quarter of an inch. In fact, North Miami Beach recorded no rain during the entire month, a first for that location since records began at that site in 2000. The highest rainfall amounts were in western Collier County, but even there totals failed to reach 2 inches for the month.

Although several cold fronts moved through the area in March, these fronts were mostly dry, with the only rainfall episodes of note occurring on March 10th-12th and March 20th. Strong wind gusts in excess of 45 mph were recorded with thunderstorms affecting the Naples and Marco Island areas on March 20th.

The persistent dry pattern led to the development of moderate drought conditions over parts of South Florida during the latter part of March, as well as contributing to several large wildfires across portions of Collier, Hendry and Miami-Dade counties. Ironically, the Greenway wildfire in western Collier County in the Picayune Strand State Forest was triggered by a lightning strike from the thunderstorms of March 20th, burning a total of over 17,000 acres as of the end of the month.

Below are March rainfall totals in inches for select South Florida sites:

Location (Beginning of Period of Record)	March 2018 Rainfall	Departure from Normal/Rank
Brighton Reservation (Glades Co.)	1.09	
Cape Florida	1.55	
Canal Point (1941)	0.35	-3.77 /6th driest
Fort Lauderdale/Hollywood Int'l (1912)	1.25	-2.11
Fort Lauderdale Dixie Water Plant	1.20	-2.16
Fort Lauderdale Executive Airport	0.86	
Fort Lauderdale Beach	1.11	
Hialeah (1940)	0.33	-3.40/ 3rd driest
Hollywood (1963)	1.25	-2.11
Homestead General Airport (1990)	0.25	-2.25
Immokalee (1971)	0.89	-2.04/9th driest
Juno Beach	0.23	
Marco Island	1.83	
Miami International Airport (1911)	0.19	-2.81/5th driest
Moore Haven (1918)	2.09	-2.63/14th driest
Muse	0.29	
North Miami Beach	0	
Naples East/Golden Gate	1.38	
Naples Municipal Airport (1942)	1.33	-1.05
NWS Miami	0.26	
Oasis Ranger Station (1979)	0.57	-2.37
Opa-Locka Airport	0.03	
Ortona (1940)	0.25	-3.42/2nd driest
Palm Beach Gardens	0.34	
Palm Beach International Airport (1888)	0.80	-3.79/17th driest
Pembroke Pines – North Perry Airport	0.85	
Pompano Beach Airpark	0.63	
Miami Executive Apt – West Kendall	0.29	
The Redland (1942)	0.59	-2.32/11th driest
Okeelanta/South Bay 15S	0.83	

Temperatures

The series of cold fronts which moved through South Florida in March brought enough cool air for monthly average temperatures to be anywhere from 1 to 3 degrees below normal area-wide. The coldest temperatures occurred between March 13th and 15th when low temperatures dropped to as low as 36 degrees in Ortona, with 40s over most of the rest of South Florida. On March 23rd, low temperatures again dropped into the upper 30s over portions of Hendry, Glades and Collier counties. As is typical for March, a period of very warm temperatures affected the area in between the cool snaps of mid and late March, with 90-degree readings registered across much of South Florida on March 20th, including 91 degrees at Opa-Locka, Juno Beach and Homestead. Here are some noteworthy temperature statistics for each of the four main climate sites in south Florida:

Miami International Airport recorded an average March temperature of 70.8 degrees Fahrenheit. This is 1.8 degrees below the 30-year normal for March. The average high temperature was 80F. The average low temperature was 65F. The hottest reading of the month was 89 degrees on the 20th. The coolest reading was 51 degrees on the 15th.

Fort Lauderdale/Hollywood International Airport recorded an average March temperature of 70.2 degrees Fahrenheit. This is 2.7 degrees below the 30-year normal for March. The average high temperature was 79F. The average low temperature was 62F. The hottest reading of the month was 90 degrees on the 20th. The coolest reading was 49 degrees on the 15th.

Palm Beach International Airport recorded an average March temperature of 67.9 degrees Fahrenheit. This is 2.6 degrees below the 30-year normal for March and is tied for the 17th coolest March on record (going back to 1889). The average high temperature was 79F. The average low temperature was 62F. The hottest reading of the month was 90 degrees on the 20th. The coolest reading was 45 degrees on the 15th.

Naples Municipal Airport recorded an average March temperature of 68.6 degrees Fahrenheit. This is 1.4 degrees below the 30-year normal for March. The average high temperature was 79F. The average low temperature was 59F. The hottest reading of the month was 88 degrees on the 26th. The coolest reading was 48 degrees on the 16th.

Other Significant March Weather Events

Large swells from a powerful winter storm off the Northeast U.S. coast pounded the Southeast Florida coast from March 4th-6th. High and rough surf conditions damaged Juno Beach Pier and closed other piers along the Atlantic coast, as well as causing beach erosion.

Outlook for April-June

The outlook by the NOAA Climate Prediction Center calls for an increased likelihood of warmer than normal temperatures through June, as well as for an increased likelihood of below normal precipitation in April followed by equal chances of above, below or near normal precipitation for the rest of the period through June. The timing of the onset of the rainy season in May will play a large role in determining South Florida rainfall relative to normal, and the eventual alleviation of spring drought conditions.

At this time it is likely that drought conditions will linger into May, therefore the wildfire risk will continue to be high. All persons are urged to take measures to reduce the chance of wildfires. Visit the Florida Forest Service web site for more information on how to help prevent wildfires.

Thunderstorms start becoming slightly more common in April and early May, before the onset of the rainy season in mid or late May brings nearly daily thunderstorms to South Florida which last through the summer months. Episodes of severe thunderstorms often occur during the transition period between the dry and wet seasons, with strong winds, hail and even tornadoes possible. Be sure to practice lightning safety by remembering this simple rule: When Thunder Roars, Go Indoors!

Rip currents also can be a problem during this time of year as the amount of beachgoers continues to increase as we head towards the end of the school year and summer vacation. All residents and visitors visiting area beaches are strongly urged to heed the advice of Ocean Rescue lifeguards and swim near a lifeguard. Visit the National Weather Service Rip Current Awareness page for more information.

Last but not least, hurricane season begins in June, which means there is no better time than now to begin getting ready. Websites such as ready.gov provide good preparedness tips.

For the latest South Florida weather information, including the latest watches, advisories and warnings, please visit the National Weather Service Miami Forecast Office's web site at weather.gov/southflorida.

The Twenty-Eighth Annual Farm Safety Day

Friday, 4 May 2018 Saturday, 5 May 2018

AN IMPORTANT MESSAGE TO EMPLOYERS

Safe and competent equipment operators are important to you as an employer. Accidents, which cause damage, injury or death to employees, equipment and crops, are costly. We believe all types of accidents can be reduced with proper employee training. Our training has been designed to help your employees perform better, operate safely to prevent accidents, fulfill necessary training requirements and build pride in themselves and their farm company.

Certificates: The 2018 Southwest Florida Farm Safety Day is almost here. Farm Safety Day is an educational event designed to emphasize the importance of farm/equipment safety. Each participant is presented with a certificate of attendance and the employer will be provided with a certificate of training that can be placed into the employee's file.

Registration Info The deadline for registration is Friday, April 13, 2018. It is the employer's responsibility to assure that the employee is present at 7:30 AM on Friday, May 4 or on Saturday, May 5 at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142 to receive their nametag. Upon arrival each participant will check in at the registration table and receive a packet containing their nametag, instructions (in both English and Spanish) session handouts, an evaluation form, rodeo cap and pencil. They will be directed to their respective course sessions.

Please give us the names of those who will be attending our 28th Farm Safety Day on Friday, 4 May or Saturday, 5 May 2018 (please select the date). The cost is \$25.00 per person, which will include educational sessions, handouts, pencils, refreshments, lunch, and a cap.

Make checks payable to: SW Florida Citrus Advisory Committee

Mail registration and checks to: University of Florida, IFAS, SWFREC Attention: Barbara Hyman 2685 State Rd. 29 North Immokalee, FL 34142

Or fax registration to: 239 658 3403 Deadline is Friday, April 13, 2018

Don't wait. The number of trainings offered and attendance at each training is LIMITED. For each day, class size is limited to the first 80 Spanish-speaking and 20 English-speaking people.

TWENTY EIGHTH ANNUAL SAFETY DAY - Friday, May 4th and Saturday, May 5th, 2018

Location: University of Florida, IFAS, SWFREC 2685 State Rd. 29 North Immokalee, FL 34142

SCHEDULE:

7:30-8:10 Check In, Coffee, Juice, Refreshments, Door Prizes

8:10-9:00 Session 1 (Begin sessions)

9:00-9:10 Break (change session, door prizes)

9:10-10:00 Session 2

10:00-10:10 Break (change session, door prizes)

10:10-11:00 Session 3

11:00-11:10 Break (change session, door prizes)

11:10-12:00 Session 4

12:00-1:30 Lunch and Adjourn

Topics/Sessions 1. Handling Materials Safety 2. Food safety 3. WPS –Handler 4. Farm Equipment Transportation Safety

The 2018 FARM SAFETY DAY REGISTRATION

Please give us the names of those who will be attending our 27th Farm Safety Day on Friday, 4 May or Saturday, 5 May 2018 at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142. The cost is \$25.00 per person, which will include educational sessions, handouts, refreshments, lunch, and a cap.

Make checks payable to: Florida, IFAS, SWFREC
Mail registration and checks to: Citrus Advisory Committee
Attention: Barbara Hyman
2685 State Rd. 29 North
University of Immokalee, FL 34142

Or fax registration to: 239 658 3403 Deadline is Friday, April 13, 2018

Company Name:

Administrative Contact Person:

E-mail address:

Mailing Address:

Telephone:

Fax:

County: _____

Please list the employees who will be attending our safety training and please check their language preference*. If there is not enough space to fill in all attendants, please attach an additional sheet with the necessary information.

*Please Note: It is very important that we know the date (Friday, 4 May or Saturday, 5 May 2018) and the language capabilities for each attendee. Next to each attendee's name please mark in which language they are more fluent. If there are any questions, please contact Barbara Hyman (hymanb@ufl.edu) at 239 658 3400. Don't wait. The number of trainings offered and attendance at each training is LIMITED. Don't wait. For each day, class size is limited to the first 80 Spanish speaking and 20 English-speaking people

WPS - respiratory medical certification and fit testing.

This is required for handlers designated to wear respirators the fumigant regulations that took affect with the release of new fumigant labels by the EPA in late Dec 2010 as well as by the 2015 Revised Worker Protection Standard for any one required to wear a respirator on the pesticide label

If the certified applicator (fumigator) intends to cease operations and exit the field at the moment the respirator-triggering sensory irritation is experienced, then no fit testing, medical qualification, and OSHA-approved training is necessary for workers who will not perform tasks requiring respirators.

Note: individuals assigned to take air samples will have to use respiratory protection even in this case.

Applicators and other handlers working with chemical whose label call for a respirator must also be medically certified and fit tested.

Employers must document:

- Date of medical qualification for respirator(s) that each handler is designated to wear,
- Date of training for respirator(s) that each handler is designated to wear, and
- Date of fit-testing for respirator(s) that each handler is designated to wear."

According to the regulations, the employer is responsible for ensuring that the employees are medically certified and fit tested as according to the OSHA regulations. The regulations do not state that there is any required training that an employer is required to have prior to conducting the fit testing.

Fit testing is done in a manner as to comply with OSHA regulations.

The OSHA regulations are listed below. It will require the purchase of fit testing equipment, see the OSHA regulations for the types of equipment you need.

General respirator and PPE information:

<http://edis.ifas.ufl.edu/pdffiles/PI/PI11400.pdf>

<http://edis.ifas.ufl.edu/pi156>

OSHA Medical Questionnaire (must be viewed by a medical professional, can also use the online services, some are listed below) - <http://1.usa.gov/pWi1O>

OSHA Mandatory fit testing procedures - <http://1.usa.gov/2sQOpG>

OSHA daily Mandatory fit test (does not require chemicals and does not replace the qualitative fit test). This should be done on a daily basis by anyone wearing a respirator. - <http://1.usa.gov/pnXJTg>

Michigan State University Fit Testing - <http://bit.ly/Mqe5hK>

Online medical certification questionnaires:

<http://www.respexam.com/>

<https://www.respiratorcertification.com/public/>

<http://www.mchaneyafety.com/RespiratorMedicalEvaluation.aspx>

http://www.bestfittest.com/medical_clearance

<http://www.sperian.com/americas/oshamedcert/>

There are many more sites like these, a quick search online will give you more options.

3M fit testing kit and instructions - <http://bit.ly/pcdGbt>

3M fit testing video – English (there is also a Spanish version) - <http://bit.ly/pcdGbt>

3M website on establishing a respirator protection program (contains the two links above) - <http://bit.ly/pcdGbt>

Any information on the 3M website is their property and is not guaranteed to comply with OSHA regulations.

The University of Florida does not endorse the use of the 3M program but I feel that it may provide the grower a good starting point in the development of their respirator protection program.

Management Tips for Florida Vegetable Growers from Dr. Phil Stansly, Entomologist at UF/IFAS SWFREC

Many of you noticed low populations of perennial pests on our late planted crops post Irma. They are coming back! It is time to start thinking about them again if you have not already.

- 1. Whiteflies:** Soil applied systemic insecticides still give the longest lasting control. Still, it is more important than ever to rotate modes of action. If you started out with a 4A neonicotinoid, available rotation options are Sivanto (4D) or Verimark (28). Both have their advantages (efficacy) and disadvantages (long PHI and high cost respectively). Check the label on the first point. Of course, you will also rotate modes of action with your sprays. Once into the season, the main battle will probably be against the nymphs, so be sure to fully utilize products such as Movento and Knack that are especially good against those life stages.
- 2. Pepper weevil.** Populations typically go way down in the summer and start slow in the fall. Don't be lulled into complacency; if you generally see them in the spring they are probably already in your crop. Use pheromone traps along field borders to provide the first heads up, and start spraying at the first sign. Don't hold crops any longer than you have to and turn them under as quickly as possible. Control nightshade both in and around your crop. Help may be coming in the form of a new attract and kill product that we hope to start testing this season. Meanwhile, don't slack up on all your chemical and cultural control options including reflective mulch for the spring crop when pressure is always worse.
- 3. Diamondback moth.** If you grow any type of brassica crop, this is for you. DBM is the champion among all insect pests in its ability to develop insecticide resistance. The good news is that it will lose resistance quickly to most any insecticide except pyrethroids if not exposed for a good while. The best strategy is to rotate modes of action on a monthly basis. In this system, any insecticide with the same IRAC number can be used during a given month and then not again until a year has elapsed. This program has worked well in Hawaii and can work in Florida. Also, try to separate successive brassica crops as much as possible to reduce movement of moths from crop to crop. Feel free to consult with us and let us know of any apparent control failures. Remember, for all these pest footprints in your crop are key to success.

Up Coming Meetings

April 20, 2018

Spanish Language WPS Train the Trainer

UF/IFAS Hendry Co Extension Office

1085 Pratt Boulevard
LaBelle, Florida 33935

Cost is \$20, call Debra at 863-674-4092 or email dcabrera@ufl.edu to register.

May 4th & 5th, 2018

TWENTY EIGHTH ANNUAL SAFETY DAY

UF/IFAS SWFREC
2685 State Rd. 29 North
Immokalee, FL 34142

See info above.

November 4–6, 2018

The 24th International Pepper Conference

Sanibel Harbour Marriott
Fort Myers, Florida, USA

Learn more at <http://conference.ifas.ufl.edu/pepper2018/>

Websites

Seminis Disease Guides - Seminis disease guides provide descriptions and pictures of the more commonly found diseases and disorders worldwide by species. For each disease and disorder, you will find the common name, the cause, where it occurs, symptoms, and conditions necessary for development and control measures. Go to <http://www.seminis-us.com/resources/disease-guides/>

PERC is the Pesticide Educational Resources Collaborative – the website provides a wealth of resources to help you understand and comply with the 2015 Revised WPS including training materials, the “new” WPS poster, handouts and WPS respiratory guide.

WPS Compliance Suite — Training Materials

Under the newly-revised Worker Protection Standard (WPS), training materials must be EPA-approved when officially training workers, handlers, and trainers.

- Expanded training concepts will be required starting January 2, 2018.
- Training must be delivered in a manner that can be understood, in a location relatively free from distractions.
- When training workers or handlers, the trainer must remain present at all times to be available to answer questions, even when showing a video.
- Trainers must be qualified, most often by holding a pesticide applicator's license or by completing an EPA-approved Train-the-Trainer course.

Training Materials for Workers and Handlers - <http://pesticideresources.org/wps/temp/training/index.html>

Need CORE CEU's? – here is an easy way to obtain CORE CEU's on-line by reading an article and answering questions regarding the online. A passing score obtains one Core CEU.

CEU Series: Mix and Load Pesticides Safely

CEU Series: Protect Crops and the Environment

CEU Series: Make Sure to Stow Your Pesticides before You Go

CEU Series: Avoid Mishaps When Handling Pesticides

CEU Series: Be Aware of Bees When Applying Pesticides
CEU Series: Place Priority on Preventing Pesticide Poisoning
CEU Series: Learning about Pesticide Resistance Is Anything but Futile

Go to <http://www.growingproduce.com/?s=CORE+CEUs>

Check out Southwest Florida Vegetable Grower on Facebook

<https://www.facebook.com/pages/South-Florida-Vegetable-Grower/149291468443385> or follow **Gene McAvoy on Twitter @SWFLVegMan** - <https://twitter.com/SWFLVegMan>

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The **South 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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