



# SOUTH FLORIDA VEGETABLE PEST AND DISEASE HOTLINE

**April 2, 2018**

**Cool windy weather over the past few weeks battered some crops especially sensitive items like cucumbers, squash and melons and growers report getting watermelon plants to set fruit has been a challenge.** There has been bloom drop in other crops like tomato, eggplant and pepper and young fruit will exhibit some wind scars as it grows. An extended period of cool nights slowed maturity and reduced supplies in a number of crops. Some areas in Hillsborough County reported some frost damage to crops.

**March has been very dry.** Most areas reported less than an inch of rain for the period with the exceptions of Balm, which received just over an inch. Reports indicate drought stress has reduced yields quite a bit in some pepper, tomato and eggplant. Some hail damage was reported in some East Coast pepper.

**FAWN Weather Summary**

Date	Air Temp °F		Rainfall (Inches)	Ave Relative Humidity (Percent)	ET (Inches/Day) (Average)
	Min	Max			
<b>Balm</b>					
2/13 – 4/1/18	32.11	87.06	1.17	71	0.11
<b>Belle Glade</b>					
2/13 – 4/1/18	40.80	89.46	0.31	74	0.12
<b>Clewiston</b>					
2/13 – 4/1/18	38.53	89.71	0.56	74	0.12
<b>Ft Lauderdale</b>					
2/13 – 4/1/18	47.57	89.20	2.81	71	0.13
<b>Homestead</b>					
2/13 – 4/1/18	43.15	87.80	0.71	76	0.12
<b>Immokalee</b>					
2/13 – 4/1/18	35.57	90.5	1.13	75	0.12
<b>Okeechobee</b>					
2/13 – 4/1/18	32.30	88.77	0.82	75	0.12
<b>Wellington</b>					
2/13 – 4/1/18	43.77	88.54	0.91	73	0.12

## When in doubt, scout!

**A wide range of produce including beets, broccoli, cabbage, cauliflower, celery, collards, eggplant, escarole, green beans, herbs, kale, lettuce, peppers, potatoes, squash, sweet corn, tomatoes and specialty items are coming to market.**

**The National Weather Service forecast indicated that a diffuse cold frontal boundary brought a few scattered showers and thundershowers across the area as the front washed out over northern parts of the area.**

**Behind the front, a relatively weak high pressure centered east of the region will be the main weather feature for the week, bringing east wind and near normal temperatures.** Dry conditions are likely through mid-week, although Atlantic sea breeze could bring a rogue shower or two to the east coast during the afternoons. Another front will enter the region late Wednesday into Thursday and may stall out for the remainder of the week, leading to slightly lower temperatures (low 80s instead of mid 80s) with a slightly better chance for showers as a shortwave trough passes well north of Florida.

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

## **Insects**

### **Whiteflies**

**Whiteflies are increasing around SW Florida and have reached serious levels in places with nymphs and pupae present in some fields but populations are still way below last spring.**

**Growers and scouts on the East Coast report that high levels whitefly in tomato and eggplant have been very challenging to control with some Q Biotype being reported.** Growers are also fighting whitefly in squash as well.

**Around Homestead, whiteflies are common in all crops and Tomato Yellow Leaf Curl Virus (TCSV) infection is severe a number of tomato fields at this stage of the season.**

**Dr Dak Seal cautions that the whitefly problem is mostly due to the:**

- I. failure to keep crop area free from old crop hosts,
- II. failure to use effective management program
- III. different hosts with variable whitefly tolerance are planted in the same area
- IV. lack of area-wide cooperation among growers.

**Dak reports that Admire at plant followed by drip application of Verimark (28 DAP) and foliar application of Venom (49 DAP) provided significant control of SLW and its transmitted TYLCV.** This program also significantly reduced Groundnut Ring Spot Virus by reducing the thrips vector.

**Respondents indicate that whitefly activity remain low around Hillsborough County.**

**Dr Phil Stansly, Entomologist at the UF/IFAS SWFREC cautions growers that this is high-risk time for whiteflies as we transition to the spring crop.** Effective early destruction of old crops accompanied by a broad-spectrum insecticide (pyrethroid-OP combination is best) and adequate protection of young crops with systemic soil applied chemistry at planting are recommended practices to avoid an early train wreck.

**While populations remain low, they can build up quickly, so growers should scout regularly to avoid being taken unawares later in the season.** Preventative soil applications of either imidacloprid,

thiamethoxam, dinotefuran, flupyradifurone or cyantraniliprole should be used as normal in tomato and cucurbits.

Consider the use of metalized (UV reflective) mulch as an additional management practice for day-flying pests such as whiteflies, thrips, aphids, pepper weevil and even broad mites, the last of these, which use flying insects to move around.

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% Scorpion 35 SL Certador 10%	5 - 7.5 oz./ac 9 - 10.5 fl oz./ac 32.5 - 47.5 fl oz./ac
Flupyradifuron	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**

**Growers and scouts report that thrips are blowing everywhere around SW Florida and note that populations can vary greatly between fields and often even within one field – one end of field may be clean and other end have over 10 per bloom.**

**Respondents indicate that east coast growers have been fighting thrips in eggplant, pepper and tomato as well as in cucumber and some other crops.** Growers have been actively applying controls in eggplant, pepper and tomato.

**Around Hillsborough County, thrips are increasing in tomatoes and melons, and the last of berries.**

**Melon thrips are common on susceptible crops around Homestead and populations are high on all crops.** 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 implement 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 showing increasing pattern, 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 a silver bullet.**

**Dr Seal reports that common blossom and western flower thrips populations are increasing in tomato and other host crops around Miami Dade County.** Flowering stage of a host plant is more preferable to common blossom and western flower thrips than the vegetative stage. For scouting, flowers should be checked carefully using hand lens. Flower thrips transmitted virus is in increasing trend in tomato in various plantings all over M-D County. Population abundance of flower thrips increased rapidly during February and March with the warming of weather. Accordingly, Tomato chlorotic spot virus (TCSV) incidence increased significantly. In some plantings, 15-25% tomato plants became infected with TCSV.

**In all instances, incidence of vector thrips and TCSV appear to have been initiated at the edge of a field close to weed, vegetable and ornamental hosts.**

**These pest thrips travel at a height below 10 feet and land as soon as they find their hosts.** Site selected management approach using effective tools can be effective, sustainable and economically profitable and environmentally sound. Recommendations include:

- Use of reflective plastic mulch (at minimum at the edge (first 2-4 beds) of a field
- Use of windbreaks to prevent thrips from finding their crop hosts.

- Some weeds at the edge of a crop field harbor thrips and harmful viruses. These weed hosts should be destroyed routinely to suppress thrips invasion.
- Chemical approach for controlling thrips is almost similar to melon thrips control.

**Dr Phil Stansly, Entomologist at UF/IFAS SWFREC reports seeing thrips in pepper blooms but notes so far, all have been Florida flower thrips (FFT, *Frankliniella bispinosa*).** This is typical this time of year as these thrips come off 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.

**Phil 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.**

### **Pepper Weevil**

**On the East Coast, weevils are increasing pepper and eggplant.**

**Around SE Florida, scouts report that it seems the weevil switch was turned on in many locations last week.** Respondents indicate that prior to last week, weevils were relatively sparse, but last week adults and new larvae started showing up in most pepper fields. Populations remain low but the level of activity this past week has been high.

**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 in reducing populations between crops. Crop destruction is probably the best option for older plantings where weevils become unmanageable.

### **Aphids**

**Respondents on the East Coast indicate that more aphids are blowing around and numbers are building up in some 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 enjoying the dry weather and populations are increasing in many places. Scouts report that some days it seems there are winged aphids blowing everywhere.**

**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.**

### **Spidermites**

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

**Growers and scouts report that spidermites are becoming more common around SW Florida and have been sprayed in several places.**

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

**Mites remain low to absent in tomato in the Manatee Ruskin area.**

### **Leafminer**

**Leafminers remain a major problem 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.**

**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 remains consistent with mostly southern armyworms, also some beet, fall, loopers, melonworms and a few pinworms in some locations.**

**Producers on the East Coast are reporting mostly moderate worm pressure but note that they are largely being kept in check by applications aimed at weevils and thrips.**

**Diamondback moth remain active in many locations on brassicas such as cabbage, cauliflower, collards, kale, arugula, and broccoli especially where crops are grown back to back in succession.**

**Fall armyworm, beet armyworm and melonworms remain active around Homestead.** Diamondback moth numbers are high. Verimark applied at plant followed by Novaluron/Radiant (28 DAP), indoxcarb (42 DAP) will provide excellent control of DBM, FAW, BAW and Melon worms. Bacillus thuringiensis based insecticides can be used in between two application of above treatments to have worm free crops.

**Low numbers of fall armyworms are present in sweet corn in the Glades.**

**Lesser corn stalk borers number 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 with drier conditions powdery mildew is starting to move in on several watermelon fields around Southwest Florida.** 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 green 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.** 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 showing up in some tomato especially in 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* fsp. *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.

**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.

## **Downy mildew of Crucifers**

**Downy mildew has been extremely active in cabbage and broccoli in a number of locations around South Florida starting at the 2 to 3 true leaf stage.**

**Downy Mildew of cruciferous crops is caused by the fungus *Peronospora parasitica*.** All crucifers are susceptible.

**Leaf symptoms usually appear on the underside of the leaf as black or dark specks on young leaves.** These spots are often irregular in shape and may appear net-like. The upper side of the leaf will also develop dark spots similar in shape and may be accompanied by leaf yellowing.

**On older leaves, these spots will often coalesce resulting in larger areas of the leaf blade having large, sunken, paper tan-colored spots.** Leaf yellowing may accompany these symptoms. Early infection on young plants can cause stunting.

**On the underside of the leaf spots, a white-grey, downy growth can often be observed with or without the aid of a hand lens, especially when leaves are wet.** On mature cabbage, downy mildew can appear as dark sunken spots on the head or wrapper leaves.

**Cauliflower curds and broccoli heads can become infected with blackened areas on the outside of the tissue.** The infection can become systemic and turn inner curd and stem tissue dark.

**Cool, wet conditions are conducive for the development of downy mildew.** Moisture is required for disease development. If temperatures are suitable, the disease will be more severe under conditions of high rainfall or heavy dews and fog.

**Downy mildew is controlled primarily by fungicides at the present time.** Protectant fungicides should be applied at least weekly beginning when nighttime temperatures are conducive for sporulation and disease development and when rains, dews or irrigations are frequent or heavy.

**Some of the newer fungicides are highly effective in controlling the disease but will typically have a limited number of applications and should be rotated between FRAC classes to reduce the possibility of the development of resistance and to help lengthen the effective lifespan of these fungicides.** Consult UF/IFAS recommendations for currently labeled fungicides for downy mildew control in Florida.

**Since favorable weather for disease development may occur at seeding or transplanting time growers should be prepared to spray at an early stage of crop development.** Growers should strive to purchase disease-free transplants. Excess transplants should not be dumped in cull piles where they might continue to grow and serve as sources of inoculum.

### **Late Blight**

**Late blight has been around SW Florida for some weeks on both tomato and potato but has not emerged as a significant factor this season.**

**Growers and scouts in the Manatee Ruskin area note that late blight is active 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.

<b>Fungicides for Late Blight</b>		
<b>Product Name</b>	<b>Brand</b>	<b>FRAC Number</b>
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
mandipropamid	Revus (fruiting vegetables)	40
Mandipropamid + difenoconazole	Revus Top (potatoes & tomatoes)	40 + 3
Dimethomorph	Acrobat, Forum	40
mefenoxam**	Ridomil – <b>Note</b> 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
Oxathiapriprolin + 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		

### **Sclerotinia**

**Growers and scouts around Immokalee continue to report low levels of sclerotinia in tomato, pepper and eggplant.**

## **Northern Corn Leaf Blight**

**Northern Corn Leaf Blight is 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.

**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*.

**Northern corn leaf blight, like southern corn leaf blight, moves 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 and should be considered, particularly for spring plantings.**

**Fungicide application can effectively control Turcicum 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 corn leaf blight control in Florida.**

## **Target Spot**

**Target spot incidence and severity is mostly low in most areas of South Florida.**

## **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.**

**Bacterial spot remains an issue around Homestead.**

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

## **Pythium**

Growers and scouts report that Pythium has been a problem in some beans where water tables were held up high.

## **Tomato Yellow Leaf Curl Virus**

Mostly low levels of TYLCV are also being reported around SW Florida and is increasing in some fields.

Around Palm Beach, TYLCV remains mostly low with some exceptions where young plantings are adjacent to older fields or you-pick operations.

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 starting to pop up in a number of watermelon fields. Scouts have reported a few symptomatic plants for several weeks but note that over the past 1-2 weeks the symptoms have been increasing.

## **Tomato Chlorotic 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 Shoaun 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.

## **Black rot**

Respondents in Palm Beach County report find mostly low levels of black rot on cabbage and other crucifers.

Black rot is also widely present in varying levels in crucifers across SW Florida.

Black rot is caused by the bacterium, *Xanthomonas campestris* pv. *campestris*. Cabbage, broccoli, cauliflower, kale, collards, radish, and other members of the cabbage family are susceptible.

In the field, the disease is easily recognized by the presence of large yellow "V"-shaped areas extending inward from the margin of a leaf, and by black veins in the infected area. Usually only a few of the outer leaves are involved.

Diseased areas enlarge and progress toward the base of the leaf, turn yellow to brown, and dry out. The veins of infected leaves, stems, and roots turn black as the pathogen multiplies. On cauliflower, black rot commonly appears on the leaves as numerous, minute brown specks. The infected lower leaves of cabbage and cauliflower are usually stunted, turn yellow to brown, wilt, and drop prematurely. Occasionally, diseased plants have a long bare stalk topped with a small tuft of leaves. In extreme cases, heading may be prevented.

**Although the distribution of diseased plants in the field may be uniform, symptoms are often more severe in wet or shaded areas.** If infected seedlings were set in the field, scattered pockets of diseased plants often appear. Diseased plants may appear in rows as a result of spread during cultural operations.

**Black rot can be controlled by utilizing an integrated control program.** The control of this disease is based the use of clean seed, and sanitation. Spraying with copper fungicides may help limit spread.

## News You Can Use

### SOUTH FLORIDA WINTER 2017- 2018 SUMMARY

#### Warmest February on Record Caps Warmer than Normal Winter - Drier Than Normal

The lack of cold fronts affecting South Florida in February led to the warmest February on record for all South Florida climate locations, easily breaking the previous warmest February back in 1959 and resembling temperatures more typical of April or even early May!

Therefore, despite a mainly cooler than normal January and a slightly warmer than normal December, the 2017 -2018 meteorological winter season (December – February) ended up among the top 20 warmest on record.

The well -advertised La Niña episode that began last fall was a main factor in setting the stage for the prevailing warm and dry winter conditions across South Florida. La Niña winters in the southern United States, including Florida, are typically characterized by warmer and drier than normal conditions due mainly to a northward displacement of the jet stream, which reduces both the number, and strength of cold fronts moving through Florida. The upper-tropospheric winds observed in most of December and February matched this pattern closely, with the February mean jet stream location from the Great Lakes to near the Canadian border. The notable exception was most of January when the mean jet stream position shifted south over the southeastern United States, allowing for more cold fronts and associated intrusions of cold air into South Florida.

Driven by the remarkably warm and record-breaking February, average winter temperatures ended up about 2 to 3 degrees above normal across South Florida. The 2017-2018 winter was the 7th consecutive warmer-than normal winter, with the last cooler than-normal winter being 2010-2011.

The coldest temperatures of the winter occurred on January 4th and January 18th when a series of strong cold fronts brought cold, continental air deep into Florida. On those two days, low temperatures dropped to the upper 20s over portions of inland Southwest Florida, including 28 degrees in Ortona on January 18th, leading to minor crop damage.

Lows elsewhere dropped into the 30s, even into portions of the Southeast Florida metro region, with lower to mid -40s to the Atlantic beaches of Miami. The more southern jet stream track in January led to more variability in week-to-week weather, with interspersed cool, warm, wet and dry periods more typical of a South Florida winter.

Otherwise, most of the winter featured the classic La Niña jet pattern displaced well north of Florida, with high pressure aloft over the southern U.S. and Florida tending to block frontal systems from moving deep into the state and causing wind flow to be more out of the east and southeast. High temperatures on a few days in February hit 90 degrees, including 91 at Ortona on February 27th.

February record temperatures

Here are average December 2017-February 2018 temperatures, departure from normal in degrees F and ranking for the four main South Florida climate sites:

Location (beginning of period of historical record) Dec 2017-Feb	Avg Temp	Departure From Normal (F)	Rank
Miami (1911)	71.9	+2.3	9th warmest
Fort Lauderdale (1912)	70.4	+0.1	17th warmest
West Palm Beach (1888)	69.7	+2.5	19th warmest
Naples (1942)	68.6	+2.5	14th warmest

Other noteworthy statistics and data:

Miami International Airport : The highest temperature recorded was 87 degrees set on December 8th and the lowest temperature recorded was 44 degrees on January 4th and 18th. The temperature reached or exceeded 80 degrees on 56 days, well above the average of 40 days. The number of days below 50 degrees was six (6) which is slightly below the 30-year mean of 8.

Palm Beach International Airport: The highest temperature recorded was 86 degrees on December 8th and the lowest temperature recorded was 38 degrees on January 4th. The temperature reached or exceeded 80 degrees on 47 days, well above the average of 31 days. The number of days below 50 degrees was 12, which is below the 30-year mean of 16.

Fort Lauderdale/Hollywood International Airport: The highest temperature recorded was 85 degrees on December 8th and the lowest temperature recorded was 39 degrees on January 4th. The temperature reached or exceeded 80 degrees on 38 days, slightly above the average of 34 days. The number of days below 50 degrees was nine (9) which is slightly below the 30-year mean of 11.

Naples Municipal Airport: The highest temperature recorded was 89 degrees on February 12th and 21st and the lowest temperature recorded was 36 degrees on January 18th. The temperature reached or exceeded 80 degrees on 48 days, well above the average of 36 days. The number of days below 50 degrees was 15, which is below the 30-year mean of 21.

### Precipitation

The northward position of the jet stream throughout most of the winter led to fewer frontal passages associated with significant precipitation. This resulted in drier than normal conditions for virtually all of South Florida. Most areas recorded 2 to 4 inches of rain this winter, about 25 to 50 percent of normal, and ranked among the 20 driest winters on record at some of these locations.

Areas in the Everglades of Miami-Dade County likely received less than an inch, with about 1 to 2 inches across much of interior Collier County. The wetter areas this winter were along coastal areas of Broward and Palm Beach counties, which recorded between 5 and 7 inches, still below normal.

Observed precipitation December through February 2018

Percent of normal precipitation December through February 2018

Following are December 2017-February 2018 rainfall totals, departure from normal in inches and ranking for selected locations:

Location	(Beginning of Period of Record)	Dec 2017-Feb 2018 Rainfall (inches)	Departure from Normal	Rank
Brighton Reservation (Glades Co.)		3.49		
Canal Point	(1941)	4.95	-1.49	
Fort Lauderdale/Hollywood Int'l	(1912)	3.74	-5.31	17th driest
Fort Lauderdale Executive Airport		5.34		
Fort Lauderdale Dixie Water Plant		4.80		
Fort Lauderdale Beach		7.06		
Hialeah	(1940)	2.77	-4.14	9th driest
Hollywood	(1963)	4.77	-4.28	
Homestead General Airport	(1990)	2.25	-2.92	4th driest
Immokalee	(1970)	3.30	-3.15	14th driest
Juno Beach		7.20		
LaBelle	(1929)	3.99	-2.16	
Marco Island		2.06		
Miami Beach	(1928)	5.81	-0.66	
Miami International Airport	(1895)	2.04	-3.87	13th driest
Moore Haven	(1918)	2.64	-2.90	
North Miami Beach		2.24		
Naples East /Golden Gate		3.53		
Naples Municipal Airport	(1942)	1.69	-3.71	7th driest
NWS Miami		3.94		
Oasis Ranger Station	(1978)	2.11	-3.07	6th driest
Opa-Locka Airport		1.18		
Ortona	(1940)	2.89	-3.45	6th driest
Palm Beach International Airport	(1888)	5.35	-3.98	
Pembroke Pines/North Perry Airport		3.08		
Pompano Beach Airpark		3.68		
Miami Executive Airport/W. Kendall		3.06		
The Redland driest	(1942)	4.08	-2.04	20th
South Bay (15S)		2.62		

#### Outlook for March -May

The outlook by the NOAA Climate Prediction Center for the period from March through May calls for an increased likelihood of above normal temperatures and below normal precipitation, essentially a continuation of the winter pattern.

Current indications are that the first half of March will be near normal to slightly cooler than normal and wetter than normal, before possibly transitioning back to the warmer and drier pattern in the long term through May.

Due to the dry winter and outlook of below normal precipitation through May, it is likely that drought conditions will develop over at least parts of South Florida this spring. This also means that the risk of wildfires will increase significantly, especially during the peak months of April and May. 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.

March and April also bring an increase in easterly winds to the area along with an increase in beach-goers. This significantly increases the risk of rip currents along the east coast beaches. A sharp increase in rip current-related drowning deaths and rescues occurs during the spring months due in part to this shift in the wind patterns and more people in the water. All residents and visitors visiting area beaches are strongly urged to heed the advice of Ocean Rescue lifeguards and swim near a lifeguard.

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](http://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 5<sup>th</sup>, 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: Mail registration and checks to: Citrus Advisory Committee 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

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.

Name Friday or Saturday  
English Spanish Name Friday or Saturday  
English Spanish

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. .

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• •

\*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/pdf/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.mchaneyssafety.com/RespiratorMedicalEvaluation.aspx>

[http://www.bestfittest.com/medical\\_clearance](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.



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>

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**Twitter @SWFLVegMan** - <https://twitter.com/SWFLVegMan>

**Contributors** include: Joel Allingham/AgriCare, Inc, Javier Soto/West Coast Tomato Growers, Gordon DeCou/Agri Tech Services of Bradenton, Dr Nick Dufault/ UF/IFAS, Carrie Harmon/UF/IFAS Plant Disease Clinic, Sarah Hornsby/AgCropCon, , Bruce Johnson/General Crop Management, Barry Kostyk/SWFREC, Leon Lucas/Glades Crop Care, Chris Miller/Palm Beach County Extension, Gene McAvoy/Hendry County Extension, Alice McGhee/Thomas Produce, Dr.Gregg Nuessly/EREC Chuck Obern/C&B Farm, Dr. Monica Ozores-Hampton/SWFREC, Dr. Rick Raid/ EREC, Ryan Richards/The Andersons, Dr Pam Roberts/SWFREC, Dr. Nancy Roe/Farming Systems Research, Wes Roan/6 L's, Dr. Dak Seal/ TREC, Kevin Seitzinger/Gargiulo, Crystal Snodgrass/Manatee County Extension, Dr. Phil Stansly/SWFREC, Dr. Josh Temple, DuPont Crop Protection, Dr Gary Vallad/GCREC , Mark Verbeck/GulfCoast Ag, Dr. Qingren Wang/Miami-Dade County Extension, Alicia Whidden/Hillsborough County Extension, Dr Henry Yonce/KAC Ag Research and Dr. Shouan Zhang/TREC.

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.

*Gene McAvoy*

Gene McAvoy

County Extension Director / Extension Agent IV

Regional Specialized Agent - Vegetables/Ornamental Horticulture

Hendry County Extension Office  
PO Box 68  
LaBelle, Florida 33975  
Web: <http://hendry.ifas.ufl.edu/>

863-674-4092 phone  
863-673-5939 mobile  
863-674-4637 fax  
[GMcAvoy@ifas.ufl.edu](mailto:GMcAvoy@ifas.ufl.edu)

*Chris Miller*

Christian Miller  
Extension Agent II – Vegetable Production & Tropical Fruits  
Palm Beach County Extension  
559 North Military Trail, West Palm Beach, FL 33415

Phone: 561-233-1718

Email: [cfmiller@ufl.edu](mailto:cfmiller@ufl.edu)

Web:

<http://discover.pbcgov.org/coextension/Pages/default.aspx>

**Special Thanks** to the **generous support** of our **sponsors**; who make this publication possible.

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***Mobley Plant World***

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*Ryan Richards*

***Wedgworth's Inc.***

710 Broward Street  
Immokalee, FL 34142  
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Naples Operations  
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Technical Sales Representatives  
Todd Villars: West Florida - 863-532-0937  
Sam Monroe: East Florida - 772-473-0873

*Dr. Nancy Roe*

***Farming Systems Research***

5609 Lakeview Mews Drive  
Boynton Beach, Florida 33437  
Phone 561-638-2755

Ed Early

***DuPont Crop Protection***

Fort Myers, Florida 33911  
Mobile 239-994-8594

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**Glades Crop Care, Inc.**  
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Charlie Mellinger, Ph.D.  
Phone 561-746-3740 Fax 561-746-3775

Stacey Howell  
**Bayer CropScience**

3481 3rd Ave NW  
Naples, FL 34120  
Phone (239) 353-6491 Cell (239) 272-8575

Justin Powell  
Southeast Business Leader

**Adama**

229 881 9757 cell  
justin.powell@adama.com

Bart Hoopingarner  
**Gowan Company**

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Parrish, FL 34219  
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Chuck Goodowns - 352-538-4471

Scott Houk  
**Dow AgroSciences LLC**

Phone 239-948-3999  
Email [sehok@dow.com](mailto:sehok@dow.com)

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Eric Johnson  
Cell 352-281-2325

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**Agricultural Crop Consulting, Inc**  
Scouting: Manatee, Hillsborough, Collier  
Office/Fax 941-776-1122  
Cell 941-713-6116  
Email: [AgCropCon@aol.com](mailto:AgCropCon@aol.com)

Donald Allen  
**AGLIME SALES INC**  
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[Adrian.jahna@basf.com](mailto:Adrian.jahna@basf.com)

   
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Jack Kilgore 239-707-7677  
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CPS/Howards/Triangle

Chuck Obern  
**C & B Farm**  
CR 835  
Clewiston, FL 33440  
Office 863-983-8269 Fax 863-983-8030  
Cell 239-250-0551

Scott Allison  
**Diamond R Fertilizer**  
PO Box 1898  
LaBelle, FL 33975  
(863) 675-3700  
[sagator@aol.com](mailto:sagator@aol.com)

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Dr. Henry Yonce  
***KAC Agricultural Research***  
Scouting, Consulting  
Research  
386-736-0098 work 386-527-1124 cell  
[HDYONCE@msn.com](mailto:HDYONCE@msn.com)

***Grower's Management, Inc***  
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