



SOUTH FLORIDA VEGETABLE PEST AND DISEASE HOTLINE

February 20, 2020

Weather over the past few weeks has varied widely with mostly unseasonably warm conditions with a number of days hitting near record temps in the mid to upper 80’s. This has been punctuated by cold fronts bringing wind and rain and dropping temps into the 30’s and low 40’s in a number of places. Rainfall totals ranged from just over 1½ in. in Balm to over 3 inches in Clewiston and a number of East Coast locations.

Cold windy conditions over the past few weeks have resulted in a fair amount of wind burn and bloom loss. Windy conditions also battered plants and scarred some fruit. Some freeze damage was also reported from several normally colder interior locations following the cold weather of January 22nd.

FAWN Weather Summary

Date	Air Temp °F		Rainfall (Inches)	Ave Relative Humidity (Percent)	ET (Inches/Day) (Average)
	Min	Max			
Balm					
1/23 – 2/20/20	40.31	87.19	1.61	81	0.08
Belle Glade					
1/23 – 2/20/20	37.78	88.66	2.27	85	0.09
Clewiston					
1/23 – 2/20/20	40.94	88.41	3.26	82	0.09
Ft Lauderdale					
1/23 – 2/20/20	45.77	88.70	3.21	80	0.09
Homestead					
1/23 – 2/20/20	40.04	86.23	3.35	85	0.09
Immokalee					
1/23 – 2/20/20	38.79	89.71	2.65	82	0.09
Okeechobee					
1/23 – 2/20/20	36.00	87.24	2.08	85	0.08
Wellington					
1/23 – 2/20/20	43.22	91.08	1.67	82	0.09

“Remember, when in doubt - scout.”

Showers, fog and heavy dews are keeping disease active.

Growers are harvesting a wide variety of vegetables and are busy planting spring crops including watermelons. Prices have been favorable for a number of items.

The National Weather Service forecast indicates that by late Thursday evening, a trough will progress southeastward across the eastern US. As this surface low forms and rapidly deepens, winds across South Florida will veer from the E/SE to the N/NW and begin to increase in strength.

A cold front projected to move through the region tomorrow bringing some scattered rain showers associated with the frontal passage.

Wind gusts are currently forecast to be at or above 30 mph for most areas of South Florida on Friday afternoon.

Saturday will be another breezy day with wind gusts forecast to be near 25 mph throughout the day across most of South Florida. Saturday morning will be the coldest morning with low temperatures forecast to be in the upper 40s to upper 50s across the region. High temperatures on Saturday will be slightly cooler than Friday, in the low 70s across much of South Florida.

Early next week, surface winds will veer to a southeasterly direction through this period, allowing for a slight uptick in moisture bringing a slight chance of showers on Tuesday and Wednesday across the northern portions of South Florida ahead of an approaching frontal boundary. High temperatures will rebound back up into the 80s.

For additional information, visit the National Weather Service in Miami website at <https://www.weather.gov/mfl/>

Insects

Whiteflies

Respondents on the East Coast report that whiteflies are still causing problems in eggplant and tomato.

Around SW Florida, whiteflies remain a major concern on a variety of crops especially in tomato and cucurbits where whitefly transmitted viruses are a threat. Populations have reached high levels in a number of locations.

Reports from Homestead indicate that whitefly numbers are building rapidly in all susceptible vegetable crops.

With whitefly populations beginning to build and continued warm weather, growers are advised to take precautions to protect spring crops especially those like tomato and watermelon where whitefly vectored viruses are a threat. Studies conducted by Dr Bill Turechek at USDA ARS looking at whitefly populations and virus incidence indicates that there is a high correlation between mild winters and the level of problems experienced in any particular year.

Efficacy Ratings for Insecticides and Miticides on Tomato

		Whiteflies	Other pests controlled			
MOA	Active Ingredient	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	fenpyroxiamate	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.

Preventative soil applications of either imidacloprid, thiamethoxam, dinotefuran, flupyradifurone or cyantraniliprole should be used preventatively in tomato and cucurbits.

Proper scouting is essential to manage silverleaf whitefly. Over the years, UF entomologists have developed usable action thresholds that have been successful for many tomato farmers. However, these thresholds are only guidelines. Farm managers may modify them to fit their particular situations and expectations. *

Silverleaf whitefly thresholds

0-3 true leaves 10 adults/plant*

3-7 true leaves 1 adult/leaflet

NOTE - *If the source of whiteflies is believed to be tomato or melons, where virus is present, the threshold will be lower!

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 -1 0.5 fl oz./ac 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

Field hygiene should be a high priority and should be an integral part of the overall strategy for managing whitefly populations, whitefly vectored viruses, and insecticide resistance.

- **Disrupt the virus-whitefly cycle in winter by creating a break in time and/or space between fall and spring crops, especially tomato and cucurbits**
- **Destroy crops quickly and thoroughly after harvest, killing whiteflies and preventing re-growth.**
- **Promptly and efficiently destroy all vegetable crops within 5 days of final harvest to decrease whitefly numbers and sources of plant viruses.**
- **Use a contact desiccant (“burn down”) herbicide in conjunction with a heavy application of oil (not less than 3% emulsion) and a non-ionic adjuvant to destroy crop plants and to kill whiteflies quickly.**
- **Time burn down sprays to avoid crop destruction during windy periods, especially when prevailing winds are blowing whiteflies toward adjacent plantings.**

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>

Leafminer

Around Southwest Florida, leafminer numbers have been variable, high in some places and low to moderate in others. Growers report that they are showing up in new plantings particularly as they move out beans as they are harvested and into nearby crops.

Around Homestead, reports indicate that leafminers continue to cause problems in beans and other crops. Dak Seal entomologist at UF/IFAS TREC, reports that in some places leafminer pressure is getting worse, most probably, due to the frequent use of pyrethroids. Growers should reduce use of pyrethroids which suppress natural enemies.

Reports from the EAA, indicate that leafminer are causing some problems in celery and leafy vegetables.

On the East Coast, respondents indicate that leafminer pressure is low to moderate depending on the location.

Leafminers are particularly damaging on celery, crucifers, cucurbits, okra, potato and tomato. In south Florida, populations peak between October and March while in central Florida they are a problem in both spring and fall.

The adults are small yellow and black flies about the size of a gnat. The female punctures or "stipples" the leaves with her ovipositor to lay eggs in the leaf tissue or to feed on sap.

Leafminer damage is easily recognized by the irregular serpentine mines in leaves. The tunnel is clear with a trail of black fecal material left behind as the maggot feeds.

Leafminer damage to foliage can render plants more susceptible to fungal or bacterial diseases, which can cause further harm to plants. Bacterial spot, Alternaria, target spot and other diseases often become established in leaf mines.

Aphids

On the East Coast growers and scouts report that aphid numbers are increasing. Scouts are beginning to find some aphid colonies in pepper and note virus incidence is increasing rapidly in squash.

Around SW Florida, aphids are still fairly low, but scouts have been finding more winged adults flying around over the past week or so and note that some colonies starting to build in places.

In the EEA, respondents report leafy crops are experienced high aphid pressure, but note that growers have been able to keep them in check except where a timely application was not made.

If not controlled in a timely fashion, green peach aphids can attain very high densities on young plant tissue, causing water stress, wilting, and reduced growth rate of the plant. Prolonged aphid infestation can cause appreciable reduction in yield of root crops and foliage crops. Early season infestation is particularly damaging to potato, even if the aphids are subsequently controlled.

As aphid densities increase on host plants, winged forms are produced, which then disperse to alternate hosts. Winged green peach aphids attempt to colonize nearly all available host plants. They often deposit a few young and then again take flight. This highly dispersive nature contributes significantly to their effectiveness as vectors of plant viruses. Parthenogenic reproduction is favored where continuous production of crops provides suitable host plants throughout the year, or where weather allows survival on natural (noncrop) hosts.

The offspring of these winged alates are wingless, and each produce 30 to 80 young. The rate of reproduction is positively correlated with temperature. As aphid densities increase or plant condition deteriorates, winged forms are again produced to aid dispersal. The dispersants typically produce about 20 offspring, which are always wingless. This cycle is repeated throughout the period of favorable weather. In Florida, this cycle repeats continuously, though in the northern areas of the state the aphid development rate slows greatly during the winter.

Scouting is important as development can be rapid, often 10 to 12 days for a complete generation, and over 20 annual generations per year may occur in mild climates. Large colonies can form seemingly overnight if crops are not checked regularly.

Worms

Around SW Florida, worm pressure had declined but seems to have picked up a bit around the full moon. Scouts report they are still some beet and southern armyworms, and loopers around. Growers continue to battle high melonworm pressure in squash and cukes.

Reports from the EAA indicate that growers are seeing a steady stream of fall and beet armyworm in sweet corn. Beet armyworm and loopers have been persistent in celery and leafy greens.

On the East Coast, respondents indicate that worms have been mostly low.

Reports from Homestead indicates that worm pressure is increasing in sweet corn.

Scouting is extremely important in detecting worms early before they can do significant damage. The Florida Tomato Scouting Guide indicates a pre-bloom threshold of 1 larva/6plants and post-bloom threshold of 1 egg mass or larva/field.

Fortunately, growers have a wide array of excellent worm control materials at their disposal these days.

Consult the UF/IFAS Vegetable Production Handbook for labeled products.

Diamondback moth

Diamondback moth (*Plutella xylostella*) larvae have begun causing damage to cabbage crops in the EAA, Homestead, Manatee/Hillsborough, Miami Dade and Tri-County (St. Johns, Putnam and Flagler) Agricultural Area.

Diamondback moth larvae are small green caterpillars with a pair of prolegs on their posterior end that form a “V” shape. This helps distinguish them from other caterpillars commonly found attacking crucifers, including imported cabbage worm and cabbage looper.

It takes about four weeks from egg to emergence of adult from the pupa for this pest.

Diamondback moth larvae only feed on plants in the crucifer family, including cabbage, broccoli, kale, mustards, radish, turnips, watercress and Brussel sprouts.

In Florida, diamondback moth is primarily a problem in green cabbage and Napa cabbage but can occur in broccoli and other crucifers. Young diamondback moth larvae feed on the surface of the leaf, producing “windowpane” type damage. There are many weeds in Florida in the crucifer family that serve as hosts for diamondback moth, including yellow rocket, shepherdspurse, pepperweed, and wild radish.

There are at least three types of parasitic wasp in Florida that attack either the larval or pupal stage of diamondback moth. Early season reliance on *Bacillus thuringiensis* (Bt) products does not interfere with the activity of these natural enemies and can offset the severity of infestations.

Pheromone traps should be used to monitor adult populations. One or more hole per plant is often used as a threshold for control.

Since adults may carry over between crops on plant debris, cultural controls such as separation of crops in time and space and sanitation including rapid crop destruction after harvest are important.

Growers should be very careful to inspect transplants when they arrive from the nursery to make sure larvae are not present.

Diamondback moth develops resistance to insecticides easily, particularly pyrethroids. Rotation of insecticide modes of action and avoidance of pyrethroids are important for managing diamondback moth. Resistance develops when successive generations of diamondback moth are treated with the same modes of action. A way to avoid or delay the development of resistance in diamondback moth is to group insecticides by mode of action in time intervals that correspond to the 30-day life cycle of the pest.

The table below lists some of the insecticides that demonstrated efficacy against diamondback moth collected from Florida cabbage fields in the spring of 2019. The mode of action number for each group is indicated in the central column. Insecticides with the same mode of action group can be applied more than once within a 30-day treatment interval, which starts when the first application of a given mode of action is made. Distinct modes of action should be used for each thirty-day interval once insecticide applications are initiated.

Protection of crucifer crops from damage often requires application of insecticide to plant foliage, sometimes as frequently as twice per week. Complete coverage especially the undersides of leaves where larvae are most often found.

The diamide insecticides (mode of action group 28) are important for management of diamondback moth larvae. If cabbage is being planted when diamondback moth populations are known to be present, the grower should consider a transplant tray treatment of Verimark (cyantraniliprole), or an at-plant treatment of Verimark or Coragen (chlorantraniliprole). At-plant treatments in cabbage would typically be applied with a water cart. Verimark and Coragen can also be applied near the root zone via soil shank injection, however this is not optimal because these two insecticides are not highly mobile in the soil.

Application via drip tape is another option, however the use of drip tape in Florida cabbage is not common. Diamide insecticides that can be applied to the foliage are Coragen, Exirel and Harvanta 50 SL (cyclaniliprole). The active ingredient in Exirel is cyantraniliprole, the same as in Verimark, which can only be applied via transplant tray or the soil. Please consult the insecticide labels for specific rates and instructions and remember applications of diamides should be confined to a 30-day interval, after which distinct modes of action should be used.

Bts remain useful tools for controlling young diamondback moth larvae. It is advised that application of products with the *aizawi* strain of Bt (i.e. Agree WG, Xentari DF) be alternated with products formulated with the *kurstaki* strain of Bt (i.e. Biobit HP, Crymax WDG, Dipel DF, Javelin WG).

Other insecticides that have proven effective against diamondback moth larvae in Florida include Radiant (spinetoram, mode of action group 5), Proclaim (emamectin benzoate, mode of action group 6, a restricted use insecticide), Torac (tolfenpyrad, mode of action group 21A) and Avaunt (indoxacarb, mode of action group 22A).

Spear Lep from Vestaron has performed well in trials conducted by Dak Seal in Homestead and provides another rotation partner in the grower's toolkit. It has been designated a new IRAC Group 32.

Florida diamondback moth populations tested in 2019 were not very susceptible to pyrethroids (mode of action group 3A), or Lannate (methomyl, mode of action group 1A). For a full listing of insecticides registered for management of caterpillars in brassicas, please consult the 2019-2020 Vegetable Production Handbook of Florida.

For additional information on diamondback moth, including images and links to help distinguish it from imported cabbage worm and cabbage looper, visit http://entnemdept.ufl.edu/creatures/veg/leaf/diamondback_moth.htm.

Some insecticides that have demonstrated efficacy against diamondback moth in Florida in 2019				
Insecticide	Active ingredient	Mode of Action Group	Application options	PHI
Verimark	cyantraniliprole	28	Transplant tray drench Transplant water Drip	N/A
Coragen	chlorantraniliprole	28	Transplant water Drip Foliar	3
Exirel	cyantraniliprole	28	Foliar	1
Harvanta 50SL	cyclaniliprole	28	Foliar	1
Radiant	spinetoram	5	Foliar	1
Proclaim (restricted)	Emamectin benzoate	6	Foliar	7
Agree WG, Xentari DF, others	<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>	11A	Foliar	0
Dipel DF, Javelin WG, others	<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>	11A	Foliar	0
Torac	tolfenpyrad	21A	Foliar	1
Avaunt 30 WG, Avaunt eVo	indoxacarb	22A	Foliar	3
Spear Lep	GS-omega/kappa-Hctx-Hv1a	32	Foliar	0

Thanks to Dr Hugh Smith, Entomologist at UF/IFAS GCREC

Thrips

Around Palm Beach County, thrips numbers are increasing and are reaching high levels in a number of locations.

Around Miami Dade County, Melon thrips populations remain high around Homestead and are increasing in beans and squash. Growers are reporting difficulty in bring them under control. Reports indicate that Radiant is not working and growers are using anything and everything they can to try and get control.

Common blossom thrips and western flower thrips numbers have also spiked in a number of places. In some green beans, high incidence of red node disease has been reported.

Scouts are finding 4-6 thrips/flower. The adults cause damage by feeding and ovipositing on foliage. In addition to red node there are also some reports of viral infection on beans which is testing positive for tospovirus (TCSV).

Cultural practices are effective in reducing thrips. Use reflective plastic mulch on field margins can help repel this virus carrying thrips. Some ornamental plants are hosts to flower thrips. If possible, growers should

avoid planting tomato within 1,000 feet of a nursery. Planting non-host crop as a barrier can also help reduce flower thrips infestation on vegetable crops.

Reports from the EAA indicate that thrips are building up in green bean blossoms. Elsewhere thrips remain very low.

Pepper weevils

Around SW Florida, pepper weevils are pretty well established in many older fields and growers report that pressure is building to serious levels in some younger fields as well.

Around Homestead pepper weevils are a major problem in pepper. Serious infestations can be observed in all plantings irrespective of pepper varieties and planting location. Actara, Vydate, Diamides and pyrethroids can be used in a program to control this pest.

On the East Coast pepper weevils are becoming more active in Palm Beach and St Lucie Counties.

In addition to the pepper weevil (*Anthonomus euginii*), we are hearing scattered reports of Cuban pepper weevil showing up around South Florida. Cuban pepper weevil adults are easily distinguished from the glossy black *A. euginii*, bearing numerous rough or raised areas, and a considerable amount of brown coloration. Larva are similar in appearance to *A. euginii*.

Sanitation and a crop-free period, if accompanied by destruction of alternate hosts, can disrupt the life cycle. It is very important to eliminate wild solanaceous host plants if pepper weevil is to be managed effectively.

Adult population estimates are best obtained by visual examination and yellow sticky traps. **Action thresholds are one adult per 400 terminal buds or 1% of buds infested.**

Insecticides are commonly applied to the foliage at short intervals once buds begin to form. Insecticidal suppression is feasible, but insecticides vary considerably in effectiveness, and even in the presence of chemical insecticides some loss commonly occurs. Consult UF/IFAS recommendations for currently labeled insecticides for pepper weevil control in Florida.

Silk fly

Respondents in the EAA indicate that silk flies are becoming more active and are showing up in corn silks shortly after they emerge.

Silk fly are also becoming more common around Homestead as the season progresses.

Routine use of pyrethroids may suppress corn silk flies in sweet corn. Cultural practices also play an important role in suppressing corn silk fly population. Growers should avoid dumping culls and destroy rotten fruits and vegetables as these sources are preferred substrates for egg laying.

Broad Mite

On the East Coast, broad Mites have been persistent and are showing up in pepper, eggplant and basil.

Around SW Florida, broad mites continue to flare up in peppers.

Reports from Homestead indicate that broad mites are widely present in a variety of susceptible crops.

Stinkbug

Growers and scouts are reporting increasing problems with stinkbugs in tomato around South Florida. In the past stinkbug have primarily been a problem in organic tomato and were rarely seen in conventional tomato crops but this situation appears to be changing and some growers have reported increasing difficulty in controlling stinkbug when they show up.

Diseases

Bacterial Spot

A combination of rain, foggy mornings and heavy dews has kept bacterial spot active on tomatoes and specialty peppers in SW Florida. Bacterial spot is severe in some older specialty and non-resistant bell pepper fields which are dropping leaves and suffering from defoliation of the lower canopy.

On the East Coast, bacterial spot is active on tomato and non-resistant pepper.

Respondents in Homestead indicate that bacterial spot incidence and occurrence is increasing in tomato and pepper.

An integrated approach is needed to manage this disease. At the field level, most inocula comes from infected transplants, volunteer plants or infected plant debris in the soil. Entry into the plant occurs through stomata or wounds made by wind driven soil, insects, or cultural operations.

Exclusion is the best means of managing bacterial spot on tomato.

Sanitation is important. Pepper and tomato volunteers and solanaceous weeds should be destroyed between crops. Purchase only certified disease-free transplants and seed.

Infected transplants can provide for long distance transplant of the disease. To reduce the incidence of disease, transplant houses should be located away from tomato or pepper fields. Transplant trays should be inspected daily for signs of disease and trays should be rouged out and destroyed at the first sign of disease. Transplant house workers should wash and sanitize their hands frequently to avoid movement of bacteria from tray to tray and house to house.

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

No resistant tomato varieties are available commercially. In pepper, a number of excellent varieties with resistance to races 1 -10 are available.

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

The traditional recommendation for bacterial spot control consists of copper and maneb or mancozeb. The effectiveness of copper is limited, because of the widespread occurrence of copper tolerance among strains of *Xanthomonas*.

In the past few years, a few products have come on the market that have given good results in research trials when used in rotation or together with traditional controls such as copper. These include Tanos (Dupont) as well as the SAR elicitor Actigard (Syngenta), Leap (Valent), Double Nickel 55 (Certis), Regalia (Maronne Bioinnovations) and Serenade and Sonata (AgraQuest). Leap is unique among the products mentioned above as it contains two active ingredients providing growers with disease management and caterpillar control.

In replicated trials at UF, two products Actigard (acibenzolar-S-methyl) and Cueva (copper octanoate) consistently performed better in the management of bacterial spot over standard applications copper hydroxide in repeated trials alone or when combined with other products.

Some growers are reporting success with an Actigard and AgriPhage combination. In this program, use Actigard every 7 days. Use phage twice a week and apply before sunset, especially before expected rains and/or immediately after. Copper and/or mancozeb may still be needed for some foliar fungal disease control.

Growers who have never used Actigard and/or AgriPhage, may want to test it in limited areas to determine its suitability. Read all label information carefully.

Attention to application techniques is as important as choice of material in achieving adequate control.

Consult UF/IFAS recommendations for formulations, rates, and intervals of currently labeled materials for bacterial spot in Florida.

Target spot

Growers and scouts around Immokalee report that target spot is present but overall incidence and severity is mostly low

Target spot is also present in some tomato on the East Coast and in Homestead as well. Target spot is also present in some eggplant around Palm Beach County.

As the season progresses, growers and scouts should be look for target spot as canopies develop and remain wet for extended periods in the morning.

Currently, target spot is controlled primarily by applications of protectant fungicides. It should be noted that tank-mix sprays of copper fungicides and maneb do not provide acceptable levels of target spot control.

Widespread resistance has been documented to QoI fungicides including both strobilurins and non-strobilurin fungicides in FRAC Group 11 and their use is not recommended for target spot control.

In addition, moderate resistance has been documented in the SDHI fungicides FRAC Group 7 which includes boscalid, penthiopyrad, fluopyram and fluxapyroxad. These should be used with caution and attention paid to rotating with alternative modes of action.

In recent efficacy trials, at the University of Florida – Approvia Top, Inspire Super, Luna Tranquility, Revus Top, Rhyme, and Scala are top performers. Contact protectant fungicides like mancozeb and Bravo

are effective and should be used early in the crop cycle switching to more efficacious materials once disease is present.

Consult UF/IFAS recommendations for currently labeled fungicides for target spot control in Florida vegetables.

Phytophthora

Reports from the East Coast indicate that phytophthora remains active and is creeping along in squash and pepper aided by recent rains.

Around Southwest Florida, phytophthora is flaring up in pepper and squash.

Phytophthora is causing problems in squash around Homestead in low lying areas.

***Phytophthora capsici* survives on host plant debris in the soil by means of thick-walled, sexually produced spores (oospores).** Both mating types of the pathogen necessary for oospore production are present in Florida. The pathogen produces spores of another type called zoospores that are contained within sac-like structures called sporangia.

Zoospores are motile and swim to invade host tissue. Plentiful surface moisture is required for this activity. The sporangia are spread by wind and water through the air and are carried with water movement in soil. Phytophthora is also moved as hyphae (microscopic fungal strands) in infected transplants and through contaminated soil and equipment.

Since water is integral to the dispersal and infection of *P. capsici*, maximum disease occurs during wet weather and in low or waterlogged parts of fields. Excessive rainfall coupled with standing water creates ideal conditions for epidemics caused by *P. capsici* and can rapidly affect entire fields. Under ideal conditions, the disease can progress very rapidly, and symptoms can occur 3-4 days after infection.

Planting sites should be well drained and free of low-lying areas.

Preplant fumigant may help reduce the incidence of disease but is not particularly effective. Equipment should be decontaminated before moving between infested and noninfested fields.

Effective, labeled fungicides should be used preventively according to label instructions. It is essential that fungicides with different modes of action be rotated to prevent the buildup of fungicide resistance in *P. capsici*. Consult UF/IFAS recommendations for currently labeled fungicides for Phytophthora control in Florida vegetables.

Lettuce downy mildew

Reports from the EAA indicated that lettuce downy mildew continues to creep around, but no major outbreaks have been reported.

Growers are advised to scout and to initiate a more rigorous fungicide program, including some of the oomycete specific fungicides to avoid any catastrophic outbreaks.

These can be alternated with a preventative program of mancozeb and phosphite tank-mixtures and these should be alternated with a good translaminar or systemic fungicide more specific to downy mildew.

There is a large selection to choose from and growers should rotate among dissimilar chemistries for management of fungicide resistance.

Consult the UF/IFAS Vegetable Production Handbook for fungicides labeled for lettuce downy mildew in Florida.

Crucifer downy mildew

Reports from around South Florida indicate that crucifer downy mildew is increasing on cabbage, broccoli, collards, and mustard greens. Downy mildew of cruciferous crops is caused by the fungus *Peronospora parasitica*. All crucifers are susceptible.

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

All plant parts can become infected with this fungus. 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.

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.

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 the UF/IFAS Vegetable Production Handbook for fungicides labeled for downy mildew of crucifers in Florida.

Fusarium

Around Immokalee, fusarium is affecting some tomatoes in wet areas.

Reports from East Coast growers indicate that fusarium is dropping some older pepper in a few fields.

Fusarium wilt fungus is able to survive in the soil for long periods of time by forming spores, thick walled reproductive structures. It also survives in infested plant debris and in the roots of weeds such as Malva and Amaranthus. It can be moved readily from field to field in infested soil that may adhere to cultivation or other equipment or in surface irrigation water runoff from infested fields.

The disease is more common on acidic, sandy soils.

Where fusarium is a concern, growers should 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. Therefore, genetic resistance can be very effective in controlling the disease, in many cases it is the only viable means of control. A few varieties are resistant to all three races.

Growers should attempt to limit the spread of infested soil by cleaning farm equipment. Avoid root knot nematode infestations because nematode feeding can overcome the plant resistance to Fusarium wilt. Long rotations out of tomatoes for several years will reduce inoculum level, although Fusarium is long-lived and even rotations of 7 years or more will not completely remove the fungus from the soil.

Anthracnose

Respondents report that anthracnose is showing up on pepper around South Florida

On the East Coast, respondents indicate that anthracnose present in most pepper fields and incidence ranges from high to low.

Anthracnose is becoming widespread on older pepper around SW Florida.

Infection typically occurs during warm, wet weather. Temperatures around 80° F are optimum for disease development, although infection occurs at both higher and lower temperatures. Severe losses occur during rainy weather because the spores are washed or splashed to other fruit resulting in more infections. The disease is more likely to develop on mature fruit that is present for a long period on the plant, although it can occur on both immature and mature fruit.

Control of this disease is best accomplished through integrated management techniques. Since the disease may be introduced on seed, only clean pathogen-free seed should be planted. Disinfection of seed with hot water treatment of seed is useful in reducing potential infections. Transplants should be kept clean by controlling weeds and Solanaceous volunteers around the transplant houses.

Fields should be well drained and be free from infected plant debris. If disease was previously present in a field, crops should be rotated away from Solanaceous plants for at least 2 years. Sanitation practices in the field include control of weeds and volunteer pepper plants.

For late-maturing peppers, when disease is present, apply a labeled fungicide several weeks before harvest. Products such as Chlorothalonil (Bravo), various strobilurin fungicides (Amistar, Cabrio, Flint, Heritage, or Quadris) and Tanos will help control the disease. Anthracnose can be controlled under normal weather conditions with a reasonable spray program. At the end of the season, remove infected plant debris from the field or deep plow to completely cover crop residue.

Sclerotinia

Growers and scouts report that Sclerotinia (white mold) is increasing in pepper and tomato on the East Coast aided by some wet nights and cooler temps a few weeks ago.

In the EAA, growers are reporting some problems with Sclerotinia drop in lettuce.

Sclerotinia is also present at mostly low levels around SW Florida.

A good indicator of Sclerotinia disease is the presence of small, black sclerotia (resting structures) of the fungus. Sclerotia can form on the surface of plant parts as well as inside the stems of pepper and tomato. The sclerotia enable the fungus to survive from season to season and are the source of inoculum to infect crops.

Another common indicator of Sclerotinia diseases is the presence of white, cottony-like mycelium of the fungus when weather conditions are cool and moist.

Symptoms vary between crops. White mold in beans usually appears after flowering. The disease often appears in leaf axils and advances into the stem, producing water-soaked spots that increase in size, girdling the stem, and killing it above the point of infection. The disease can also enter the plant through leaves or pods that touch the soil where sclerotia or infected plant parts act as inoculum.

In tomato, potato and pepper, infection typically starts at flowering. Water-soaked spots are usually the first symptom, which is followed by invasion of the stem, girdling, and death of the upper part of the stem that turns a light gray. The disease can also begin where the plant contacts the soil or infected plant debris. Large portions of the field may become diseased, producing large, circular, areas of dead plants. The black sclerotia formed by the fungus are often found inside infected stems.

Almost all Sclerotinia diseases are field diseases, but when they occur in post-harvest situations, they can be very damaging. In beans, the fungus may create a mass of diseased pods that is stuck together by fungal growth, resembling a nest (hence, the name "nesting").

Under cool moist conditions, the fungus can invade a host plant, colonizing nearly all of the plant's tissues with mycelium. Optimal temperatures for growth range from 15 to 21 degrees Celsius. Under wet conditions, *S. sclerotiorum* will produce an abundance of mycelium and sclerotia. The fungus can survive in the soil mainly on the previous year's plant debris. High humidity and dewy conditions support the spread and increases the severity of infections.

In beans, fungicides including Botran 75 W, Endura 70 WG, Iprodione 4 L Quadris F, Rovral 4 F and Switch applied at bloom stage have been effective in controlling white mold. Iprodione and Rovral 4 F have

been used with good results in lettuce. For potato, Iprodione 4 L, Rovral 4 F and Topsin M WSB and 4.5 L are recommended for Sclerotinia control while in tomato Amistar 80 DF has given good results. Biologicals like Contans WG, Serenade Max and Sonata have also provided various degrees of control alone and in combination with other fungicides.

Consult UF/IFAS recommendations for currently labeled fungicides for sclerotinia control in Florida vegetables.

Powdery mildew

Powdery mildew is widely present and increasing in squash and beans in several locations around South Florida from Ruskin down to Homestead.

Tolerance or resistance to powdery mildew is available in some vegetable crops. Most commercial cucumber varieties grown in Florida have acceptable levels of resistance.

In addition to resistance, economic control can be achieved with chemicals. Under low disease pressure, some materials applied preventatively for downy mildew may provide satisfactory control of powdery mildew. However, under moderate to heavy mildew disease pressure, micronized sulfur (Thiolux) and the strobilurin fungicides such as Flint, Nova and Quadris are recommended. Newer materials such as Pristine and Quintec have also performed well in University trials.

Growers should be aware that sulfur could injure plants, especially at higher temperatures.

When using strobilurin fungicides growers should be sure to follow manufacturer's recommendations and practice resistance management by avoiding consecutive applications. Some of the bio-fungicides like Regalia, Rhapsody and Sonata may provide good rotation partners.

Options for organic growers include the use of resistant varieties, cultural practices that ensure proper plant nutrition and plant vigor in addition to sulfur and potassium bicarbonate sprays for disease control.

Consult UF/IFAS recommendations for currently labeled insecticides for powdery mildew control on cucurbits in Florida.

Stemphylium leaf spot

Leafy green producers in the EAA are experiencing problems with Stemphylium leaf spot in spinach.

Initial symptoms of Stemphylium leaf spot caused by the fungus *Stemphylium botryosum f. sp. spinacia*, on leaves consist of small (0.13 to 0.25 inch diameter), circular to oval, gray-green leaf spots. As the disease progresses, leaf spots enlarge, remain circular to oval in shape, and turn tan in color. Older spots coalesce, dry up, and become papery in texture. Visual signs of fungal growth are generally absent from the spots; hence this problem is readily differentiated from foliar diseases in which purple growth (downy mildew), green spores (Cladosporium leaf spot), or acervuli (anthracnose) develop within circular lesions.

Overall, symptoms resemble the tan, circular spots caused by pesticide or fertilizer damage. Weeds or other reservoir hosts have not been identified. This pathogen is seedborne.

Chemical control with fungicides is effective in reducing disease development. Miravis Prime and various azoxystrobin fungicides are recommended for control.

Downy Mildew

Around Southwest Florida, respondents indicate downy mildew pressure has been high in squash and cukes.

Gummy stem blight

Around SW Florida, gummy stem blight is present in some watermelon fields, but incidence and occurrence remain low.

Southern Corn Leaf Blight

Respondents in the EAA and around Homestead indicate continued unseasonably warm weather has kept Southern corn leaf blight active on sweet corn around South Florida.

Southern corn leaf blight is caused by the fungus *Bipolaris maydis*. Although seedling blights can also be caused by *B. maydis*, symptoms of Southern corn leaf blight typically occur on leaves.

Lesions caused by southern corn leaf blight are much smaller (up to ½ inch wide and 1 inch long) than those caused by northern corn leaf blight. 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*. A greenish growth near the center of the lesion may be evident if spores are present.

When severe, lesions may become so numerous that they coalesce and turn the entire leaf necrotic. Southern blight, like northern blight, moves from the lower canopy to the upper canopy.

Typically, lower leaves are infected first progressing upward to higher leaves over time. Occasionally, infections of the ear husk, silks, kernels, cob, and floral bracts in tassels occur.

Fungicides should be applied early, particularly if the forecast is for warm, humid weather. As with northern corn leaf blight, the sterol inhibitors and strobilurin fungicides are most efficacious. These products should be used together with a broad-spectrum protectant to minimize development of fungal resistance.

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

Bean red node/Tobacco Streak Virus

Bean growers in Homestead are reporting severe issues with red node - caused by the thrips vectored tobacco streak virus. Bean red node is caused by a member of the genus *Iarvirus* 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.

In tomato, downward curling of leaf blades of tomato infected with tobacco streak is common. Leaf veins become necrotic which can lead to necrotic blotches, especially on young leaves. Fruit may develop necrotic ringspots. Necrotic streaks on young stems extend to flowers and leads to flower drop.

Tobacco streak virus 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 the field by several species of thrips including western flower thrips, *Frankliniella occidentalis*, and onion thrips, *Thrips tabaci*.

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

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

Tomato Yellow Leaf Curl Virus

Around SW Florida TYLCV is present at mostly low levels. Growers and scouts report that they are beginning to find a few symptomatic plants in spring crops.

Respondents in Homestead indicate TYLCV incidence is increasing in a number of fields.

Tomato Chlorotic Spot Virus

Reports from Homestead report TCSV is increasing in tomato fields. TCSV is also showing up in some beans.

Growers and scouts in Palm Beach County report that TCSV is showing up couple pepper farms where incidence remains mostly low.

TCSV-infected tomatoes develop necrotic lesions of variable size, easily recognized necrotic and chlorotic spots, and ringspots on leaves, stems, petioles, flowers, and fruit. Symptoms are like those of GRSV and, to a lesser extent, some isolates of TSWV. Although apparently less common, chlorotic spots and ringspots may form prior to or at the same time as necrotic lesions. Following the onset of these symptoms, wilting and bronzing of the infected plant may occur. TCSV infections in young tomato plants may result in severe stunting and eventually death. Fruit from infected plants may show necrotic ringspots, necrotic spots, and distortion, rendering them unmarketable.

Symptoms in pepper plants include severe stunting, necrotic spots, necrotic ringspots, and severe leaf deformation. Fruit from infected pepper plants can be deformed and present ringspots and irregular coloring.

TCSV, like other members of the Tospovirus genus, is vectored by certain thrips species. As with other tospoviruses, TCSV is only acquired by the larval (1st and 2nd instar) stages of the thrips vector as they feed on infected plants.

TCSV is known to be transmitted by three species of thrips: common blossom thrips (*Frankliniella schultzei*), western flower thrips (*F. occidentalis*), and flower thrips (*F. intonsa*)

Surveys by Dr Scott Adkins et al have found TCSV on weeds such as purslane in production fields.

Cucurbit Crumple Leaf Virus and Cucurbit Yellow Stunting Disorder Virus

Growers and scouts are already reporting finding low levels of cucurbit crumple leaf virus and cucurbit yellow stunting disorder virus in watermelon around SW Florida.

Bacterial Soft Rot

Reports from the East Coast indicate that bacterial soft rot in pepper (*Erwinia* sp.) has picked up recently with repeated showers over the past week or so.

Growers should keep harvest crew out of wet fields to reduce spread.

News You Can Use

Recent Climate Records - So Far this Week...

Monday:

Naples: Record High Minimum of 70 (broke record of 68 last set in 1998)

Tuesday:

Naples: Record High Maximum of 90 (broke record of 86 last set in 2018)

West Palm Beach: Record High Minimum of 74 (broke record of 73 last set in 1961)

Fort Lauderdale: Record High Minimum of 75 (broke record of 72 last set in 2008)

Miami: Record High Minimum of 74 (broke record of 73 last set in 1995)

Wednesday:

Naples: Record High Minimum of 73 (broke record of 72 last set in 1959)

West Palm Beach: Record High Minimum of 75 (broke record of 74 last set in 1961)

Fort Lauderdale: Record High Minimum of 75 (broke record of 73 last set in 2018)

Miami: Record High Minimum of 75 (broke record of 74 last set in 1929)

Operation Clean Sweep

The Florida Department of Environmental Protection and the Florida Department of Agriculture and Consumer Services announces the 2019-2020 Operation Clean Sweep program, a mobile pesticide collection effort that

provides a safe way to dispose of cancelled, suspended, and unusable pesticides. The free service is available to farms/groves, greenhouses, nurseries, golf courses, and pest control entities.

For more information, including how to sign up, click here:

<https://floridadep.gov/waste/permitting-compliance-assistance/content/operation-cleansweep-pesticides>.

2019 - 2020 UF/IFAS Vegetable Production Handbooks

Copies are available at the Hendry County Extension Office in LaBelle, the Miami Dade County Extension Office, the Palm Beach County Extension office in West Palm Beach, the UF/IFAS Everglades Research and Education Center in Belle Glade and the UF/IFAS SW Florida Research and Education Center in Immokalee.

Up Coming Meetings

February 25, 2020 Sweet Corn Pest Management Workshop 8 AM – 1 PM

UF/IFAS Everglades Research and Education Center
3200 Palm Beach Road Belle Glade, FL 33430

Please RSVP – 561-233-1718 or Chris Miller at cfmiller@ufl.edu

February 25, 2020 Vegetable Growers Meeting 9 AM – 1 PM

Focus on cucurbit and tomato viruses and their management

UF/IFAS Southwest Florida Research and Education Center
2685 SR-29 N
Immokalee, Florida 34142

Please RSVP – 239-658-3400 or email Zoe Watson at zshobert@ufl.edu

February 27, 2020 5th Annual Florida Agricultural Policy Outlook Conference 9:00 AM – 4:30 PM

University of Florida-IFAS, Citrus Research and Education Center
700 Experiment Station Road, Lake Alfred, FL 33850

The UF/IFAS Food and Resource Economics Department is pleased to announce the 5th Annual Florida Agricultural Policy Outlook Conference to examine critical policy issues facing Florida agribusiness leaders and explore valuable economic insight helpful for making informed business and policy decisions.

Sessions include:

Managing Florida's Natural Resources
State, Federal and International Agricultural Policy
Industrial Hemp and Medical Marijuana

Register online at <https://www.eventbrite.com/e/5th-annual-florida-agricultural-policy-outlook-conference-2020-tickets-88881086723>

March 6, 2020 Bridging the GAPS: Approaches for Treating Irrigation Water On-Farm 8:30am - 4:00pm

UF/IFAS Everglades Research and Education Center
3200Palm Beach Road Belle Glade, FL 33430

Regional experts will discuss different approaches to treating water on-farm and how to implement pre-harvest water treatment systems, meet the water treatment requirements of the Produce Safety Rule, and how to verify that the system is operating as intended.

Cost to Attend: \$50. Cost includes the training materials, lunch, and refreshments. Seats are limited to 30. For questions, email Sarah McCoy at sarahmccoy@ufl.edu

Agenda

- 8:30 – Registration
- 9:00 – Welcome and introductions
- 9:15 – Agricultural Water Treatment and FSMA
- 10:15 – Agricultural Water Treatment Tools
- 12:00 – Lunch
- 12:45 – Developing On-farm Agricultural Water Treatment Programs
- 2:30 – Implementing Agricultural Water Treatment on the Farm
- 4:00 – Adjourn

Please register at: <https://bridgingthegaps030620.eventbrite.com>

March 12, 2020 Lettuce Advisory Committee Meeting 12 PM – 3 PM

UF/IFAS Everglades Research and Education Center
3200Palm Beach Road Belle Glade, FL 33430

Updates on Lettuce tolerance to pendimethalin, Evaluation of a Commercially Available Irrigation Water Chlorination System for Leafy Green Production, Management of Stemphyllium leaf spot on spinach, Mitigating Pink-rib in lettuce, On-farm insect sampling with traps.

March 14, 2020 Rare Fruit Council Plant Sale 9 AM – 2 PM

South Florida Fairgrounds
[9067 Southern Blvd, West Palm Beach, FL 33411](https://www.sffairgrounds.com/)
Buildings 8-10 (Enter at Gate #8)

For more than 30 consecutive years Palm Beach RFC has been bringing 100's of varieties and 1000's of tropical fruit trees and plants to select from at their plant sales. Avocado, Bananas, Barbados Cherry, Black Sapote, Canistel, Carambola, Citrus, Dragon Fruit, Figs, Guava, Grumichama, Jackfruit, Jaboticaba, Longan, Lychee, Macadamia, Mamey Sapote, Mango, Mulberry, Papaya, Peach, Persimmon, Sugar Apple, Star Apple, Tamarind, Herbs & Spices, Specially formulated Fertilizer and much much more! <http://pbrarefruitcouncil.org/>

March 17, 2020

Produce Safety Alliance – Grower Training

8:00AM – 5:00PM

UF/IFAS Everglades Research and Education Center
3200 Palm Beach Road Belle Glade, FL 33430

Fruit and vegetable growers and others interested in learning about produce safety, the Food Safety Modernization Act (FSMA) Produce Safety Rule, Good Agricultural Practices (GAPs), and co-management of natural resources and food safety are encouraged to attend. The PSA Grower Training Course is one way to satisfy the FSMA Produce Safety Rule requirement.

The trainers will spend approximately seven hours of instruction time covering:

- Introduction to Produce Safety
- Worker Health, Hygiene, and Training
- Soil Amendments
- Wildlife, Domesticated Animals, and Land Use
- Agricultural Water (Part I: Production Water; Part II: Postharvest Water)

Cost to Attend: \$25

Please register at: <https://psa031720.eventbrite.com>

For questions, email Sarah McCoy at sarahmccoy@ufl.edu

Websites

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. <http://pesticideresources.org/index.html>

PERC - 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. At present, the only EPA approved materials available can be found at the PERC website

- 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 CEU's?

Here are a couple of ways to earn CEU's

1. Earn CORE CEUs for pesticide license renewal in your office or at home

CEU: Continuing Education Units
<http://citrusindustry.net/ceu>

Earn CEU Credits NOW online through Southeast AgNet & Citrus Industry Magazine

The following series of articles and quizzes are available:

- 2019 #4: The fate of pesticides (10/31/2020)
- 2019 #3: Protecting soil and water while using pesticides (7/31/20)
- 2019 #2: At-a-glance safety information (4/30/20)
- 2019 #1: What is a pesticide, really? (1/31/2020)

Need more CORE CEUs – 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.

Go to: CEU Series-Growing Produce

<https://www.growingproduce.com/crop-protection/ceu-series>

- 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
2. To earn Ag Row Crop, Ag Tree Crop or Private CEUs for pesticide license renewal, attend seminars/workshops at the Immokalee IFAS Center.
 3. To earn CEUs for pesticide license renewal in any category, go to: <https://pested.ifas.ufl.edu/ceu> note there is a charge for these.

Worker Protection Standard Train the Trainer Classes Now On-Line

Exam Administrators - Cesar Asuaje, UF/IFAS Palm Beach County has developed and made available a new EPA-approved WPS Train the Trainer online option. See the following:

The Environmental Protection Agency (EPA) approved this online Worker Protection Standard Train the Trainer (WPS TTT) course, and upon successful completion, the Florida Department of Agriculture and Consumer Service (FDACS) will issue a WPS TTT certificate.

This certificate provides the qualification to train agricultural workers and pesticide handlers under the Worker Protection Standard requirements. The course was developed in collaboration with Ricardo Davalos, Florida WPS coordinator from FDACS.

Cost is \$35

The course is available in the IFAS Catalog at the following link: Certificate version: <https://ifas-farmlabor.catalog.instructure.com/courses/wps-ttt>

EPA-approved Fumigant training program for certified applicators using methyl bromide, chloropicrin, chloropicrin and 1,3-dichloropropene, dazomet and metam sodium and potassium. Applicators must retrain every 3 years. - <http://www.fumiganttraining.com/>

Check out Southwest Florida Vegetable Grower on Facebook

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

UF/IFAS Palm Beach County Extension: <http://discover.pbcgov.org/coextension/Pages/default.aspx>

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The **South Florida Pest and Disease Hotline** is compiled by **Gene McAvoy** and is issued on a biweekly basis as a service to the vegetable industry.

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