



SOUTH FLORIDA VEGETABLE PEST AND DISEASE HOTLINE

January 3, 2018

December was mostly warm although a cold front moved through the area in early December dropping overnight low temps into mid to upper 30's for several days and a few reports of light patchy frost and cold damage in some areas. Daytime temperatures have been mostly in the mid-70's and 80's with nighttime temps in the 50's and 60's.

Scattered showers and foggy mornings towards the end of December have helped keep diseases active. Most areas reported over an inch for the month with Ft Lauderdale topping 5 inches for the month.

FAWN Weather Summary

Date	Air Temp °F		Rainfall (Inches)	Ave Relative Humidity (Percent)	ET (Inches/Day) (Average)
	Min	Max			
Balm					
11/22/17 – 1/2/18	34.72	83.80	2.19	83	0.06
Belle Glade					
11/22/17 – 1/2/18	33.19	86.86	1.74	85	0.06
Clewiston					
11/22/17 – 1/2/18	37.43	86.25	1.44	86	0.06
Ft Lauderdale					
11/22/17 – 1/2/18	42.13	86.49	5.76	80	0.06
Homestead					
11/22/17 – 1/2/18	35.11	85.55	0.77	84	0.06
Immokalee					
11/22/17 – 1/2/18	35.07	87.22	2.09	86	0.06
Okeechobee					
11/22/17 – 1/2/18	34.15	85.95	1.58	86	0.06
Wellington					
11/22/17 – 1/2/18	38.57	88.47	1.64	85	0.06

Wishing you all the best for a Happy and Healthy New Year

Light volumes of a range of vegetables are coming to market and prices have been generally favorable. Tomato harvest in the Manatee Ruskin area is wrapping up while south Florida production areas are taking over.

The National Weather Service forecast indicates the frontal boundary has stalled south of the state, with much colder air and gusty north-northeasterly winds spreading down the peninsula in its wake. The wind shift is also setting up a convergence boundary that could generate scattered to numerous showers.

Rain chances will taper off pretty quickly by Wednesday evening. This will allow colder air to move down the peninsula Wednesday night. Temperatures by daybreak Thursday are expected to drop into the mid-30s for much of the interior, with upper 30s and low 40s for the Gulf coast and western portions of the east coast metro.

The main story for the latter half of the week will be well below normal temperatures across the region as another Arctic high builds across the central and eastern US in the wake of the departing low. Models indicate that temperatures Thursday will struggle to get out of the 50s, even along the coastal areas.

Thursday night looks to be the coldest of the week as winds calm allowing lows to drop into the mid-upper 30s across the interior and upper 30s and low 40s for the coasts. The immediate east coast may remain in the mid-40s. Friday night is expected to run around 5 degrees warmer, but the potential for a frost or freeze over the interior and the coldest spots along the coasts the next few nights can't be ruled out.

Late weekend into early next week will bring warming temperatures and isolated to occasionally scattered showers for South Florida.

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

Insects

Leafminer

Around SW Florida, growers are battling leafminers in a variety of crops and respondents indicate that pressure is severe in new plantings in some locations.

Leafminer pressure is moderate in tomato and eggplant on the East Coast.

Leafminers remain active in Homestead as well.

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.

Leafminers have a relatively short life cycle. The time required for a complete life cycle in warm environments such as Florida is often 21 to 28 days, so numerous generations can occur annually in tropical climates.

An integrated pest management program that stresses conservation of natural enemies is important for the successful control of leafminer. Chemical control can be difficult due to the feeding habits inside the leaf of the host plant. Insecticides that specifically target the leafminer are recommended as use of broad-spectrum materials may decimate beneficial insects including those that attack leafminer. This often results in a larger leafminer problem if the pesticide reduces numbers of leafminer parasites.

Several parasites for this insect have been recorded in Florida, but parasitic wasps are most common. Up to 90% parasitism in non-sprayed tomatoes has been observed in Florida.

To determine whether leafminer larvae are dead or alive, leaflets can be held up to the sun and examined with a hand lens. Living larvae are a pale yellow and flush with the end of the mine. The back and forth feeding movements are readily visible, although movement may cease when larvae are disturbed or molting. Dead larvae do not show movement and are usually discolored and removed from the ends of mines.

Therefore, it is important that the scouting program include not only an assessment of the number of leafminers present but also the natural enemies.

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

East Coast growers are reporting low to moderate worm pressure in pepper and other crops. A few European pepper moth larvae (*Duponchelia fovealis*) are showing up in some fields.

The adult moths are around $\frac{3}{4}$ in size. The forewings are gray-brown in color with two yellowish-white transverse lines. When at rest, the wings are held out from the body forming a triangle. The following features may aid in identification: abdomen has cream-colored rings and cream-colored wavy lines across the middle of the hindwings.

The larvae have a shiny dark head and a salmon pink body (but color may vary depending on host plant) with a line of separated brown to gray spots extending across and around each segment. There is also a hard dorsal plate (or sclerotized region) located on the segment just behind the head. Feeding damage caused by larvae of the European pepper moth often displays characteristic rounded or crescent-shaped holes.

Reports from SW Florida indicate that worm pressure has also increased with mostly southern armyworms, a few loopers, fruitworms, beet and fall armyworms showing up in a variety of crops.

Worms are also widely present in Homestead and melonworms have been causing trouble cucurbits.

Whiteflies

The Manatee Ruskin area is reporting increased whitefly pressure.

Around SW Florida, whitefly populations are also increasing in tomato and squash.

Growers and scouts on the East Coast indicate that whitefly numbers are variable from low in some tomato to high in some eggplant. Whiteflies are also present in kale and some crucifers as well.

Reports indicate that whiteflies are also showing up on some crops around Homestead.

For 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

Respondents report that western flower thrips are increasing in some areas of Palm Beach County, Growers and scouts are finding some larvae developing in blooms and under stems of fruit mainly in pepper although some foliar feeding under foliage has been reported in eggplant.

Some reports of “dark thrips” - probably common blossom thrips - have come in from some pepper fields where scattered plants with tomato chlorotic spot virus is also showing up.

Melon thrips are fairly common on susceptible crops around Homestead.

Reports from the Hillsborough County indicate that chilli thrips are causing unprecedented problems in strawberry and pepper.

Chilli thrips, *Scirtothrips dorsalis*, a relative newcomer to Florida is a significant pest of chili pepper and many other crops in tropical and subtropical regions of the world.

Feeding activity deforms young leaves and stains or scars fruits. Chilli thrips attacks all above ground parts of its host plants, and prefers the young leaves, buds and fruits.

Heavy feeding damage turns tender leaves, buds, and fruits bronze to black in color. Damaged leaves curl upward and appear distorted. Infested plants become stunted or dwarfed, and leaves with petioles detach from the stem, causing defoliation in some plants.

Field identification of chilli thrips is extremely difficult and definitive identification is best accomplished at approximately 40 to 80x magnification.

Spider mites

Growers in Palm Beach County report seeing some spidermite activity in eggplant.

Low levels of spidermite activity is also being reported on eggplants and some cucurbits around SW Florida

Broad Mite

Mostly low but increasing numbers of broad mites are being reported in peppers and eggplant in all areas of South Florida.

On the East Coast, broad mites are becoming common in pepper and eggplant.

Aphids

Around SW Florida some aphids are starting up in some cucurbits and in peppers. Populations remain low in most places.

Respondents on the East Coast indicate that aphids are present in low numbers in a variety of crops.

Elsewhere a few winged aphids are blowing around through a variety of crops but remain at very low numbers.

Pepper Weevil

Growers and scouts in all areas are beginning to report seeing mostly low to very low levels of pepper weevil in pepper.

Respondents in ST Lucie County indicate that numbers are starting to build in older fields.

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.

Since adults tend to move to lower, more protected and less visible plant parts as temperatures increase, scouting efforts should concentrate on a search for adults in leaf whorls, flowers and fruit during morning hours.

Commercially available pheromone traps may also 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 has been the standard control and has given pretty good results when sprayed weekly in trials at the Southwest Florida Research and Education Center. A total of 24 pts can be applied for the season.

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.

Some growers report limited success with Neemix and fish oil both of which seem to be most effective when used preventatively before weevils become established.

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.

Stinkbug

Growers and scouts report a few problems with stinkbug mainly in organic crops.

Diseases

Bacterial Speck

Some reports of bacterial speck on tomato have been received.

Bacterial speck of tomato, caused by *Pseudomonas syringae* pv. tomato, is a disease occasionally seen in Florida fresh-market tomato production.

Tentative field diagnosis of bacterial speck is best accomplished by inspection of fruit symptoms. Speck lesions on green fruit are small, sunken, black spots surrounded by darker green haloes. On ripe fruit, spots are dark brown to black, superficial flecks.

Foliage symptoms of bacterial speck are much more difficult to distinguish from other diseases. The leafspots are small, black lesions surrounded by prominent chlorotic (yellow) haloes. These haloes are quite large, averaging twice the size of the necrotic tissue they surround. Bacterial speck lesions are very superficial and do not crack or become scaly like spot.

Lesions in the stems are dark brown to black and shaped like elongated ovals.

Bacterial speck is favored by cool, moist environmental conditions. The virulent bacteria are spread mechanically and by wind-driven rain. A period of stormy weather; followed by overcast days with cool temperatures increases risk of outbreaks.

Pesticides applied for bacterial spot control, should also provide some bacterial speck control. Resistance to copper exists, and therefore copper may be only partially effective in reducing the impact of susceptible strains. Phage strains (Agriphage) are available for *Pseudomonas syringae* pv. Tomato. Use of products like Oxidate may help reduce infield spread of the disease.

Bacterial spot

Around Southwest Florida, bacterial spot has slowed but is still moving some, mostly in tomatoes. Some specialty peppers have significant bacterial spot.

Respondents in the Manatee Ruskin area report that bacterial spot is present and has moved into the tops of some tomato.

Bacterial spot remains active in East Coast tomato and some pepper aided by recent foggy mornings.

Bacteria is also widespread in tomato in Homestead.

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.

It is important to apply sprays before and during rainy periods. Spraying wet plants can actually assist in the spread of bacterial spot. If conditions are favorable, frequent spraying may not be sufficient to maintain bacterial spot below damaging levels.

In the past few years, a number of 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. The effectiveness of copper is limited, because of the widespread occurrence of copper tolerance among strains of *Xanthomonas*. Application techniques are as important as choice of material in achieving adequate control.

Bacterial Leaf Spot of Lettuce

A small isolated outbreak of Bacterial Leaf spot (BLS) on lettuce has been confirmed in the Everglades Agricultural Reserve.

The causal agent of the disease is the bacterium *Xanthomonas campestris* pv. *vitians*. Early symptoms of BLS are small, angular-shaped, water-soaked spots that do not penetrate or cross leaf veins. Lesions will blacken within a short amount of time and may eventually coalesce if the disease is severe.

Disease development is dependent on cool temperatures and wet conditions. BLS is easily spread by wind-driven rain and may also be spread by field personnel and equipment moving through the field.

Area growers are advised to thoroughly scout romaine, iceberg, leaf, and butter lettuce types as all are susceptible to BLS. Growers should also take care to avoid moving people and equipment through diseased fields when morning dew is present. It is also recommended to clean and sanitize equipment and tools used in a contaminated field before moving and using them elsewhere.

Contact EREC Plant Pathologist, Richard Raid (rnraid@ufl.edu) to confirm suspect samples.

Halo Blight

Dr. Shoaun Zhang, Pathologist at UF/IFAS TREC reports that green bean growers in Homestead are experiencing some problems with halo blight. Halo blight is caused by the bacterium *Pseudomonas syringae* pv. *phaseolicola*.

Symptoms of halo blight initially appear as small water-soaked spots on the underside of the leaflets, eventually developing into numerous small, reddish-brown lesions on the leaves. Greenish-yellow halos, highly variable in size, subsequently develop around these spots. During severe infections the disease may become systemic and cause yellowing and death of new foliage. At temperatures above 80°F halos are very small or absent. Pod symptoms first appear as small water-soaked spots and streaks on the pod surface. The water-soaked areas enlarge and are sometimes surrounded by a narrow reddish zone. Light, cream-colored bacterial exudate may be present on the lesions under moist conditions.

Infected bean seed is the most important source of both bacteria. Growers should plant only certified, disease-free seed.

Varieties differ greatly in their susceptibility to different bacterial diseases. Growers should choose bean varieties with tolerance or resistance to the bacterial diseases that occur frequently in the growing area if possible.

Copper-based bactericides can help reduce populations of bacterial pathogens on bean foliage, and also reduce disease severity when applied as a preventative. These compounds, however, cannot eradicate the pathogens once the plants are infected. If wet weather is persistent, bacterial populations can increase very quickly and are difficult to arrest unless several applications of copper-based bactericides are made.

Target spot

Around Immokalee target spot is present in the bottoms in older tomatoes but seems to have slowed a bit with drier weather the past few weeks.

Target spot continues as a major concern in the Manatee Ruskin area.

Target spot is frequently misdiagnosed as in its early stages as symptoms are difficult to recognize and can be confused with bacterial spot and early blight.

The name derives from the bull's eye appearance that is often displayed in lesions caused by the disease. Since concentric rings are not always visible and not all lesions with concentric rings are target spot, it is recommended that a laboratory diagnosis be obtained to ensure that a correct diagnosis is made.

On tomato leaves and stems, foliar symptoms of target spot consist of brown-black lesions with subtle concentric rings giving them a target-like appearance. These can sometimes be confused with early blight. With early blight, the lesions are often associated with a general chlorosis of the leaf.

On tomato fruit, lesions are more distinct. Small, brown, slightly sunken flecks are seen initially and may resemble abiotic injury such as sandblasting. As fruits mature the lesions become larger and coalesce resulting in large pitted areas. Advanced symptoms include large deeply sunken lesions, often with visible dark gray to black fungal growth in the center. A zone of wrinkled looking tissue may surround the margins of lesions on mature fruit. Placing suspect fruit in a moist environment for 24 hours will often induce the growth of dark gray mycelia providing telltale diagnostic evidence of target spot infection.

Optimum conditions for disease development include temperatures from 68° - 82°F and long periods of free moisture.

In trials, wounding was essential for reproduction of the fruit symptoms. Wind-blown sand is probably important in outbreaks of target spot on tomato fruit in the field.

Strategies for the management of this disease require an integrated approach for best results.

Growers should rotate fields to avoid carryover on crop residue and avoid rotations among solanaceous crops. Eliminate any volunteers and weed species that can act as a host.

Start with clean, healthy transplants and maintain proper fertility as nitrogen deficiencies favor the development of early blight.

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.

Early Blight

Low levels of early blight are being reported on tomato around South Florida.

Sclerotinia

Growers and scouts on the East Coast are reporting seeing low levels of Sclerotinia showing up in pepper and eggplants.

Respondents are also reporting problems with Sclerotinia in green beans around Homestead.

The fungus, *Sclerotinia sclerotiorum*, is responsible for a number of vegetable diseases attacking a wide range of crops. Common names for Sclerotinia diseases in Florida are white mold (beans), drop (lettuce), white mold (pepper, potato and tomato), and nesting (post-harvest disease of bean).

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.

High humidity and dewy conditions supports the spread and increases the severity of infections.

Phytophthora

Growers in Miami Dade County report that Phytophthora blight caused by *P. capsici* continues to cause problems in some squash fields due to wet conditions. Yellow squash seems to be more affected than zucchini.

Reports from East Coast production areas indicate that Phytophthora has shown up in areas with rapid increases in some pepper and squash. Both crown and aerial infection is present depending on location. Some

Phytophthora is present in eggplant as well and remains rare in tomato.

Growers and scouts report that Phytophthora is taking out some pepper plants in scattered locations around Southwest Florida.

Current options for pre-transplant applications include a Ranman (cyazofamid, 21) drench up to one week before transplanting or as a seedling tray drench at transplanting for Pythium and Phytophthora in tomato, pepper, and eggplant. Previcur Flex (propamocarb HCL, 28) has a label for the suppression of Pythium and Phytophthora in tomatoes and peppers. Phosphite fungicides such as ProPhyt, Rampart, and K-Phite (FRAC code 33) can also be applied as a pre-transplant drench in the greenhouse. Additionally, there are a number of biologicals such as Trichoderma, Streptomyces, and Bacillus products which can also be used in the greenhouse as drenches or incorporated in to the soilless mix to help suppress soil-borne pathogens. Remember, biologicals typically need to be applied without conventional fungicide.

At transplanting applications include Ranman (cyazofamid, 21) in the transplant water or through drip irrigation for Pythium control. There is a section 2ee for the use of Previcur Flex (propamocarb HCL, 28) + Admire Pro (imidacloprid) in transplanting water for fungus and insect control.

Presidio (fluopicolide, 43) has a label for drip application for Phytophthora control when conditions are favorable for disease development. Additionally, phosphite fungicides, Pro-Phyt, Rampart, and K-Phite (FRAC code 33) can also be applied through drip irrigation at transplanting to help suppress Phytophthora blight.

Fusarium

Grower and scouts in Manatee County report that fusarium is starting to blow up in some fields with a history of the disease.

East Coast growers report some instances of fusarium taking out older pepper plants.

Botrytis

Botrytis gray mold is caused by the ubiquitous asexual fungus *Botrytis cinerea* has been reported on some tomatoes in the Manatee Ruskin area.

Botrytis can affect all aboveground plant parts of tomato. This fungus occurs as both a pathogen and a saprophyte causing diseases such as damping off, stem girdling, foliar blighting, and postharvest rots.

Botrytis produces a dense velvety gray brown spore mass on infected tissue which when disturbed releases a cloud of spores. Tomato leaf and stem lesions are tan to brown in color. Stem infections occur during periods of high humidity through leaf scars, cracks, and pruning wounds.

Stem lesions may expand in concentric rings to girdle the entire stem causing wilting above the infection site. Flower petals are very susceptible and can initiate infection of pedicels and developing fruit.

Fruit lesions are typically a whitish soft rot and often the skin ruptures near the center of the decayed area allowing spores to form on exposed tissue.

Small 3-8 mm whitish rings on the fruit surface are aborted botrytis infections known as ghost spots which reduce market quality.

Southern Blight

Growers also finding some southern blight showing up in tomato around Manatee County and in SW Florida – not at high levels but more than is normally seen in the fall.

Since many growers in SW Florida who lost plastic due to the Hurricane and re-bedded and laid plastic without a fumigant, growers should be alert for the possibility of increased levels of soil borne diseases.

Rhizoctonia

Growers in the Glades continue to report problems with rhizoctonia on green beans planted in wet soils.

Rhizoctonia is also causing some problems on beans around Homestead.

Halo Blight

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Infected bean seed is the most important source of both bacteria. Growers should plant only certified, disease-free seed.

Varieties differ greatly in their susceptibility to different bacterial diseases. Growers should choose bean varieties with tolerance or resistance to the bacterial diseases that occur frequently in the growing area if possible.

Copper-based bactericides can help reduce populations of bacterial pathogens on bean foliage, and also reduce disease severity when applied as a preventative. These compounds, however, cannot eradicate the pathogens once the plants are infected. If wet weather is persistent, bacterial populations can increase very quickly and are difficult to arrest unless several applications of copper-based bactericides are made.

Northern corn leaf blight

Dr Rick Raid, Pathologist at EREC reports that northern corn leaf blight beginning to surge, with a decline in southern corn leaf blight.

Northern corn leaf blight caused by the fungus *Exserohilum turcicum* was one of the most important sweet corn disease in southern Florida causing significant losses some years. It is still a potential threat, occurring every spring and occasionally late fall. Resistant varieties have helped reduce the impact of northern corn leaf blight in recent 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.

Disease development is favored by heavy dews, frequent showers, high humidity and moderate temperatures. Infection occurs when free water is present on the leaf surface for 6 to 18 hours and temperatures are 65 to 80 F.

Infections generally begin on lower leaves and progress up the plant, but infections may begin in the upper plant canopy when spore loads are high.

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.

Threat is highest from mid Feb into April but it may be seen during the fall as well.

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.

Tomato Yellow Leaf Curl Virus

TYLCV is showing up widely around Manatee and Hillsborough Counties with some fields reaching as high as an 8 - 10% infection rate.

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

Very low levels of TYLCV have been reported in Homestead and on the East Coast.

Tomato Chlorotic Spot Virus

TCSV is showing up in a few isolated places in Palm Beach County and more widely in the Homestead area.

Cucurbit Leaf Crumple Virus

Low levels of cucurbit leaf crumple virus continue to show up in watermelon around SW Florida. ID has been confirmed in the lab.

Crumple leaf virus has also been reported on cucurbits in the Homestead area.

Mosaic Virus

Low levels of mosaic virus are also being reported on watermelon around SW Florida

Tomato Chlorotic spot virus.

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

Cucumber mosaic virus

Some cucumber mosaic virus showing up on pepper around SW Florida. Incidence and occurrence is low.

Gummy stem blight

Mostly low levels of gummy stem blight continue to be reported in fall watermelon around SW Florida.

Anthracnose

Anthracnose is showing up on some fall watermelons.

This disease is favored by high temperatures and frequent rains and high humidity which promote disease development and spread.

All aboveground plant parts can be infected. Symptoms vary among the species of cucurbits infected. Leaf lesions begin as water soaked and then become yellowish circular spots. On watermelon foliage the spots are irregular and turn dark brown or black. On cucumber and muskmelon, the spots turn brown and can enlarge considerably. Stem lesions on muskmelon can girdle the stem and cause vines to wilt. Stem cankers are less obvious on cucumbers.

The most striking diagnostic symptoms are produced on the fruit, where circular, black, sunken cankers appear. On watermelon the spots may measure 1/4 to 1/2 in. (6 to 13 mm) in diameter and up to 1/4 in. (6 mm) deep. When moisture is present, the black center of the lesion is covered with a gelatinous mass of salmon colored spores. Cankers lined with this characteristic color can never be mistaken for any other disease. Similar lesions are produced on muskmelon and cucumber.

Anthracnose (*Colletotrichum* spp.) is also causing major issues on some herbs such as oregano and rosemary.

Leaf symptoms begin as small, pale yellow or water-soaked lesions that rapidly enlarge and turn tan to dark brown or irregular and black. As lesions merge, large areas of the leaf may appear blighted or entire leaves may die.

Powdery mildew

Reports from around Southwest Florida indicate that powdery mildew is flaring in some squash and cucumbers and is present at low levels in some watermelon.

Growers and scouts in Homestead report that powdery mildew is widely present on squash.

Reports from Palm Beach County indicate that powdery mildew remains low.

Downy Mildew

Growers and scouts around Southwest Florida report that downy mildew pressure has ramped up and is going strong in cucurbits especially in squash and cucumbers.

Downy mildew is also causing problems in squash around Homestead.

Reports from Pam Beach County indicate that Lettuce downy mildew and downy mildew on crucifers is active but low in most areas.

Lettuce downy mildew, caused by *Bremia lactucae*, has been observed and confirmed in the Glades growing region. Growers are advised to be on a consistent preventative program using mancozeb and a phosphite, and now that the disease is present should 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 can check with their suppliers and read the label carefully before using for plant back, use patterns, and rates.

Downy mildew on crucifers (cole crops) has also been confirmed. Given the cool, wet weather, growers should be on a preventative fungicide program. In general, fungicides that are labeled for lettuce downy mildew also perform well against *Hyaloperonospora parasitica*, the crucifer downy mildew pathogen. Again, check labels before applying.

Stemphylium

Leaf spot trials for all of our spinach growers looks like there is definitely resistance to the strobilurins, which had been the go-to compounds.

Black rot

Respondents in Palm Beach County report finding mostly low levels of black rot on cabbage and other crucifers and note that disease progression has slowed over the past few weeks.

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

2017 South Florida Weather Year in Review

Wildfires, Hurricanes, Flooding, Record Temperatures Highlight 2017

December 27, 2017: This year will likely be remembered as a year of extremes. A strong La Nina dominated South Florida's weather at the beginning of the year bringing drought conditions, which led to an active fire weather season. The wet season was highlighted by above average rainfall and several tropical systems, including hurricane Irma which made landfall in Marco Island. The end of the year has brought a return of La Nina conditions, resulting in warm and dry conditions for November and December.

Below are the top 5 weather stories of 2017:

#1 Weather Story of 2017 Hurricane Irma: September 10th

Major Hurricane Irma was the first hurricane to make landfall in South Florida since Hurricane Wilma in 2005. Ironically enough, Irma made landfall in the same place as Wilma and at the same intensity: Marco Island. After landfall on Marco Island at 335 PM on September 10th, Irma traveled north over southwest Florida through the evening hours before going into Central Florida. Effects from Irma were felt across all of South Florida from September 9th through September 11th. Irma had reached Category 5 strength and a minimum central pressure of 914 MB east of the Bahamas, maintaining Category 5 intensity until landfall along the north coast of Cuba on September 9th. Irma made its first Florida landfall in the Lower Florida Keys early on September 10th as a Category 4 hurricane.

Irma brought widespread wind damage, heavy rainfall and storm surge to all of South Florida. Hurricane-force sustained wind were measured in much of Collier County, as well as far southern and inland Miami-Dade County, with the possibility of additional hurricane-force sustained wind in more isolated areas over the remainder of South Florida where widespread tropical storm force sustained wind occurred. Gusts to hurricane force were felt over all of South Florida, with the maximum measured wind gust of 142 mph in Naples in Collier County. Widespread tree damage and some structural damage occurred across all of South Florida, with most structural damage on the minor side.

Irma brought a significant storm surge on both coasts of South Florida. A maximum storm tide of 9 to 10 feet was observed in Chokoloskee and Everglades City, 6 to 7 feet in Goodland and 4 to 5 feet from Marco Island to Naples. Along the east coast, observed storm tide values of 4 to 6 feet were noted along Biscayne Bay from south of Miami to Homestead, and 2 to 4 feet elsewhere along the east coast from Key Biscayne to Palm Beach.

Hurricane Irma brought widespread rainfall and some flooding across the region. From the period between 8 AM EDT September 9th and 8 AM EDT September 11th, 8 to 15 inches of rain were measured over interior portions of Southwest Florida, with estimated amounts of 16 to 20 inches in southwestern Hendry County. This rainfall near the end of a wet summer led to significant flooding over these areas. 5 to 10 inches of rain were noted elsewhere across South Florida, with areas of minor to moderate flooding.

32 deaths were attributed to Irma in southern Florida, all but one indirect. The only direct death was an 86-year-old man who was knocked down by a gust of wind while opening the front door of his home in Broward County. Most of the deaths occurred during cleanup after the storm, as well as several as a result of carbon monoxide poisoning from misuse of generators. Initial and incomplete damage estimate across the area is estimated to be around \$800 million, but in all likelihood will be much higher once damage assessments are completed. \$222.5 million in damage came in from Collier County, and about \$300 million from Palm Beach County. About \$255 million came from the agricultural community in Miami Dade County.

#2: June 4-7 Heavy Rain

A disturbance meandering across the Gulf of Mexico in combination with an upper level low pressure over the western Gulf of Mexico led to nearly a week of heavy rainfall across South Florida. The heaviest rainfall fell in the corridor from Marco Island and southern Collier northeast into Broward and southern Palm Beach counties. Some locations in this swath saw single-day rainfall amounts in excess of 10 inches, with a few locations as much as 15 inches, resulting in 3-day event totals of 15 to 20 inches over the entire swath. Elsewhere, rainfall amounts ranged from around 4 inches across southern Miami Dade to 7 to 8 inches over the rest of South Florida.

This rainfall forced the closure of numerous roads across South Florida, especially in Collier and Broward counties where cars were trapped at times in the flood waters. Flooding also led to the closure of Everglades Airpark in Everglades City as well as Sawgrass Mills Mall in Broward County. Significant flooding was also recorded in the Everglades, leading to road and trail closures in Big Cypress National Park.

This event started what ended up being the wettest rainy season on record for Naples, Miami and Miami Beach, and among the top 5 wettest on record for several other locations. For the South Florida Water Management District region which covers all of South Florida and parts of Central Florida, it was the second-wettest 5-month period on record (June – October) going back to 1932. Most areas received over 50 inches of rain between June and October, equaling or surpassing the average rainfall for an entire year. In Golden Gate, an amazing 79.89 inches of rain was measured between June and October, the most of any observing site in South Florida.

#3: Collier County Wildfires March/April

Considering the extremely wet summer in Collier County, it's hard to believe that the months leading up to it were very dry. Naples only recorded 3.03 inches of rain from January to April, the 9th driest such period on record. The resulting dry conditions, along with warmer than normal winter and spring temperatures, resulted in one of the worst wildfire seasons in recent memory in Southwest Florida. Collier County, particularly the Picayune Strand State Forest and Golden Gate Estates. Three wildfires affected these areas in March and April, starting with the Lee Williams Road wildfire from March 5th through the 13th, followed by the 30th Avenue and Frangipani wildfires which began on April 20th and didn't become 100% contained until April 25th. Total damage caused by the three wildfires totaled over \$4 million, destroying 18 structures and triggering the evacuation of portions of Golden Gate and the closing of roads, schools and businesses in the area. Fortunately, no deaths were reported and one man was injured while trying to save his property from the fire.

Severe drought conditions were in place over Collier County in April and May, with extreme drought conditions north of Lake Okeechobee.

#4: Tropical Storm Emily Rainfall/Flooding July 31st-August 1st

Near the mid-point of the rainy season came heavy rainfall and flooding in association with Tropical Storm Emily which formed in the eastern Gulf of Mexico. On July 31st, bands directly associated with the outer fringes of Emily triggered wind gusts of tropical storm force along and offshore the Collier County coast. On August 1st as Emily was over the Atlantic and moving away from Florida, a trough extending from the tropical system to over Southeast Florida triggered several rounds of strong storms and heavy rain across Miami Dade County during the afternoon and early evening hours. Activity initially streamed across Miami Beach, Key Biscayne and Downtown Miami just after 2 PM, then redeveloped farther to the west and southwest across The Redland, Kendall, Palmetto Bay and Pinecrest later in the afternoon. Rainfall totals of 4-6 inches were widespread in these areas, with isolated amounts of 7-8 inches. Virtually all of this rain fell in a three-hour period during the mid and late afternoon ending around 6 PM. Numerous reports of flood waters entering businesses, homes, apartment lobbies and parking garages were received across Miami Beach during the event.

Water was 1 to 2 feet deep on streets in many areas of South Beach, including Purdy Avenue, West Avenue, Alton Road, Pennsylvania Avenue, Meridian Avenue, Collins Avenue, Washington Avenue and Indian Creek Drive. Numerous vehicles stalled in these streets and others across the city. Across the City of Miami, especially Downtown Miami, more than 10 businesses, stores and buildings in the vicinity of Mary Brickell Village had at least 1 to 4 inches of water inside their structures.

Rainfall map from August 1st across Miami-Dade County

#5: Tornadoes in Miami-Dade and Palm Beach Counties – January 23rd

A powerful squall line well ahead of a cold front over the Gulf of Mexico moved across South Florida during the overnight and pre-dawn hours of January 23rd. Three tornadoes affected the area, two in Palm Beach County and one in Miami-Dade County.

The Palm Beach County tornadoes were associated with the same supercell thunderstorms that moved E-NE from Belle Glade to Juno Beach. Touchdown of the first tornado was in The Acreage at 125 AM, where EF-0 damage was noted to trees and fences. A second tornado spawned from the same storm touched down a few minutes later, at 140 AM, in Palm Beach Gardens where it caused roof damage in the Mirabella neighborhood. This tornado damaged fences, buildings, and bleachers at The Benjamin School and Dwyer High School, then followed a discontinuous path across Palm Beach Gardens, affecting the Evergrene and Frenchman's Creek developments. The tornado then moved into Juno Beach where it damaged 8 mobile homes and moved offshore at Juno Beach Pier where a wind gust of 87 mph was measured at 149 AM.

The Miami-Dade County tornado touched down at 345 AM near the Palmetto Expressway and NW 48 Street, damaging an apartment building. The tornado touched back down on the east side of the Palmetto Expressway in a warehouse district from NW 50th Street to NW 52nd Street between NW 74th and 69th avenues. In this area, EF-0 to borderline EF-1 damage (75-85 mph winds) was noted. A tractor trailer was overturned, at least 2 dozen empty cargo containers were moved, and minor roof damage occurred to an office building. The tornado then moved NE and crossed into Miami Springs. Primarily impacted was the "Bird District" between Shadow and Ludlum Avenues and Falcon and Dove Avenues. The worst damage was in this area and consisted of loss of roof covering material and downed trees. Winds were likely in the EF-1 range (90-95 mph) in this area. Damage was observed along a NE path along the remainder of the Miami Springs portion of the path, with most of the damage east of Hammond Drive to Okeechobee Road consisting of downed power lines and trees (EF-0). After crossing Okeechobee Road, the tornado entered the City of Hialeah and caused damage to the area from Red Road to W 2nd Avenue between West 10th and 13th streets. Four two-story apartment buildings sustained roof damage of EF-1 intensity (up to 95 mph). The tornado passed very close to a water plant, but no damage was noted there. The tornado lifted near W 2nd Avenue and W 13th Street. A total of 13 families were left homeless in Hialeah and required Red Cross assistance.

2017 Precipitation Data and Summary

Precipitation Summary:

Despite the dry beginning to the year due to La Nina conditions, the wet season in South Florida was even more wet than usual. Most of the climate sites registered yearly amounts that landed in the top 20 wettest. Two sites that stand out are Marco Island and Naples East, where both locations shattered their yearly rainfall records. The Opa-Locka Airport also ended up with its wettest year on record. While most locations observed higher than normal rainfall, there was a pocket in Hendry and Glades counties of slightly below normal rainfall and also near coast areas of Miami-Dade County.

2017 Temperature Data

Temperature Summary: With just a few days to go in the year, Miami is currently tied for its warmest year on record. Naples will end up 3rd warmest, Fort Lauderdale 4th, and Palm Beach 6th. What really stands out in 2017 is the number of temperature records set. Miami set an astounding 53 high temperature records in 2017, with only 2 cold temperature records. Fort Lauderdale set 35 high temperature records and 6 cold records. Palm Beach set 28 high temperature records and 4 cold records. Finally, Naples set 22 high temperature records and 7 cold records. As has been the trend in previous years, high minimum temperature records made up a majority of the temperature records.

Severe Weather and Weather-Related Deaths/Injuries/Impacts:

A reported total of 36 people died in South Florida from weather-related incidents in 2017 (up from 5 in 2016) and an additional reported 32 were injured (up from 16 in 2015).

- 32 deaths were attributed to Hurricane Irma (1 direct). Total damage estimate \$800 million (and counting)
- Rip currents accounted for 3 deaths and 12 injuries. The deaths occurred in January (Broward), April (Miami-Dade) and May (PBC)
- Lightning accounted for 1 death (June in Broward County) and 3 injuries. Total estimated damage \$10,000
- Flooding/Heavy Rain accounted for 1 injury. Damage estimate \$1.1 million - Abnormal heat accounted for 15 injuries, all on July 25th on Miami Beach - Wildfires resulted in 1 injury. Damage estimate \$4 million

Tornadoes: 15 tornadoes reported (yearly average is 8, last year we had 9). 7 EF0, 6 EF1 and 2 unrated. 5 occurred with Irma and 3 with Philippe. 3 on January 23rd, 1 in March, 1 in May, 1 in June and 1 in October. Damage estimate at least \$1 million. Severe Thunderstorms: 14 severe thunderstorm wind reports (58 mph or greater), much lower than the 25-year average of 29. Hail (3/4 inch or greater): 7 reports, much lower than the 25-year average of 18 Flooding: 15 events (not including Irma-related rain/surge). Many of those occurred during the King Tide event in early October.

2015 Revised Worker Protection Standard

Word on the street indicates that the 2015 Revised Worker Protection Standard will come into effect in Florida shortly after the Florida Legislature meets in early January 2018. Adoption of the rule in Florida was delayed pending legislative action - once this happens FDACs inspectors will begin to base WPS inspections on the requirements contained in the 2015 Revised Worker Protection Standard. Initially inspectors will be in compliance mode to assist grower with coming into compliance under the 2015 revisions.

For more information, visit the EPA Worker Protection Standard website at <https://www.epa.gov/pesticide-worker-safety/agricultural-worker-protection-standard-wps>

Here you will find links to:

- Regulation in 40 CFR Part 170
- How to Comply Manual
- Interpretive Guidance
- Quick Reference Guide (PDF)
- Guía de referencia rápida (en español)
- WPS Compliance Monitoring Program
- Comparison chart of the revised WPS and the previous requirements.
- Comparison chart of the revised WPS and the previous requirements. (en español)
- Regulatory information on the revised WPS

Please feel free to call or write if you have questions.

Up Coming Meetings

January 11-14, 2018 **2018 SE Regional Fruit and Vegetable Conference**

Savannah, Georgia

For more information and registration, go to <http://www.seregionalconference.com/>

January 18 -20, 2018 **2019 Florida Watermelon Convention**

Trump International Plaza Hotel
18001 Collins Ave
Sunny Isles, FL 33160

For more information and registration, go to <https://www.flfwa.com/2017-convention-sanibel-island>
(Note URL says Sanibel 2017 but will take you to the right place)

January 23, 2018 **Vegetable Growers Meeting – Focus on BMPs and Fertility** **12 – 2 PM**

UF/IFAS SW Florida Research and Education Center
SR 29
Immokalee Florida

To RSVP, contact Debra at 863-674-4092 or email dcabera@ufl.edu

January 27, 2018 **12th Annual Florida Seed Association Seed Shoot**

Sporting One Sporting Clays
7500 SR 70
Lake Placid, FL

For more information or to register, contact Arlen Wood – 863-660-6540

February 21, 2018 **WPS Train the Trainer Program** **8:30 AM – 3:30 PM**

EREC Conference Center
3200 E. Palm Beach Road
Belle Glade, FL

Contact Ethel Scott to register, eescott@pbcgov.org or 561-233-1975.

Cost = \$25

November 4-6, 2018 **24th International; Pepper Conference**

Fort Myers, Florida

For more information, go to <http://conference.ifas.ufl.edu/pepper2018/index.html>

Websites

NRCS assistance can help producers integrate high tunnels into their operations and provide financial assistance through the Environmental Quality Incentives Program (EQIP). Learn more at <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/organic/?cid=nrcseprd1364702>

WPS Compliance Suite — Training Materials

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

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

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

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

CEU Series: Mix and Load Pesticides Safely

CEU Series: Protect Crops and the Environment

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

CEU Series: Avoid Mishaps When Handling Pesticides

CEU Series: Be Aware of Bees When Applying Pesticides

CEU Series: Place Priority on Preventing Pesticide Poisoning

CEU Series: Learning About Pesticide Resistance Is Anything but Futile

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

Check out Southwest Florida Vegetable Grower on Facebook

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

Check out Palm Beach County Extension at:

- <http://discover.pbcgov.org/coextension/agriculture/Pages/default.aspx>
- <https://www.facebook.com/vegetableandtropicalfruituf.ifas.extpbcc/>

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