



SOUTH FLORIDA VEGETABLE PEST AND DISEASE HOTLINE

November 4, 2019

Conditions across South Florida have been unseasonably hot and dry for the past few weeks. In fact, October broke records for the hottest October on record in many locations.

Most locations recorded less than an inch of rain over the past few weeks. Despite relatively dry conditions, foggy mornings have helped keep disease pressure kicked off by rainy weather earlier in the month relatively active.

FAWN Weather Summary

Date	Air Temp °F		Rainfall (Inches)	Ave Relative Humidity (Percent)	ET (Inches/Day) (Average)
	Min	Max			
Balm					
10/20 – 11/4/19	65.66	92.32	0.76	87	0.11
Belle Glade					
10/20 – 11/4/19	70.00	94.93	0.81	89	0.11
Clewiston					
10/20 – 11/4/19	69.84	92.86	0.99	87	0.11
Ft Lauderdale					
10/20 – 11/4/19	73.02	92.91	0.29	81	0.12
Homestead					
10/20 – 11/4/19	68.81	91.18	0.07	83	0.12
Immokalee					
10/20 – 11/4/19	68.36	94.98	0.40	85	0.12
Okeechobee					
10/20 – 11/4/19	67.46	92.25	1.48	89	0.11
Wellington					
10/20 – 11/4/19	72.41	93.81	2.45	88	0.10

“Remember, when in doubt - scout.”

Temperatures have been unseasonably warm with daytime highs in the upper 80's and low 90's; night have been mainly in the 70's.

The National Weather Service forecast through next weekend indicates is a weak front is currently stalled over the northern portion of South Florida, from around Indiantown in Martin County, southwest towards Belle Glade, Sunniland, and Marco Island. The front may meander around the area for at least the next several days.

With the front remaining over the northern portion of the area, most of the area does not look to benefit from any lower temperatures or dew points, although the cloud cover should help to keep high temperatures slightly lower than the last several days. North of the front, mainly in northern Glades County, the dew points may dip into the upper 60s.

From Monday evening into Tuesday, low-level easterly flow is expected to continue becoming established over South Florida, owing to the reinforcement of surface ridging north of the forecast area. Temperatures will rebound some, with highs in the upper 80s to low 90s.

Adequate low-level moisture along the southern periphery of the surface ridge is forecast to maintain chances for showers and perhaps a few thunderstorms through the upcoming week.

By the end of the upcoming week into next weekend, model guidance is suggesting the potential for a frontal system -- accompanied by enhanced precipitation chances followed by an influx of notably cooler drier air to overspread South Florida sometime during the Friday-Saturday time frame.

Otherwise, temperatures through much of the upcoming week are forecast to remain near to slightly above normal -- prior to the possible arrival of a frontal system.

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

Insects

Worms

Growers and scouts indicate that worm pressure has subsided marginally but remains high in most places.

Reports from Central Florida indicate that growers in the Manatee Ruskin area continue to battle fruitworms, armyworms and persistent loopers in tomatoes and pepper.

Growers in the EAA report that fall armyworm pressure remains high in sweet corn and along with a good measure of corn earworms also showing up in places. Beet and southern armyworms are present in celery and leafy greens.

Respondents around SW Florida report that worm pressure subsided slight but seems to have picked back up. Scouts report finding a mixed bag of tomato fruit worms, southern, beet and fall armyworms, and tomato hornworms with southern armyworms remaining the most common.

Several respondents report obtaining good control of most species but note that beet armyworms seem to be harder to control or at least slower to die. Melonworms have been persistent in squash and cucumbers. **On the East Coast, growers and scouts indicate that beet armyworms have been very active in pepper and eggplant.** Melon worms have been a significant issue on cucurbits if growers are not on a stiff management program.

Around Homestead, growers are battling a variety of leps including fall armyworm on corn, melonworms in cucurbits and southern and beet armyworms in tomato and peppers.

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.

Dr Dak Seal, entomologist at UF IFAS TREC advises that *Bacillus thuringiensis*, and Spear-T in rotation with other materials can help provide effective control of worms. He notes that in trial, Rimon has proven an effective growth regulator in controlling beet and fall armyworm and other worm pests. Rimon also provides excellent control of cucumber beetle. Knack in rotation with Xentari provided significant control of worm pests (DBM and others). He advises growers to avoid using broad spectrum insecticides where possible to avoid flaring problems with thrips, mites and other insects.

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

Leafminer

Around Homestead, reports indicate that leafminers numbers are increasing. 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.

In Hillsborough and Manatee counties, leafminer pressure has been persistent in tomato and cucurbits and growers are spraying as threshold levels are reached.

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

Around Immokalee, growers and scouts report leafminer are becoming more common in tomato and eggplant, and that sprays are being applied as threshold levels are reached.

The two major species of leafminer that cause problems in vegetables in Florida are the vegetable leafminer (*Liriomyza sativae*) and the American serpentine leafminer (*L. trifolii*).

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.

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

Field sanitation is an 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.

Whiteflies

Growers and scouts in the Manatee/Hillsborough are actively battling whiteflies in tomato and eggplant as well as in cucurbits such as squash, melons and cantaloupe

On the East Coast, whitefly numbers are increasing, and nymphs are showing up in older tomato and eggplant.

Around SW Florida, whiteflies are patchy in occurrence but numbers are increasing in number in most places. Reports indicate that whitefly numbers are mostly low in pepper and tomato with moderate to high pressure in cucumbers, squash, and eggplant.

Respondents in Homestead report that whitefly populations are building rapidly in a variety of crops.

While whitefly populations remain low to moderate in most places, they can build up quickly, so growers should scout regularly to avoid being taken unawares later in the season. Preventative soil applications of either imidacloprid, thiamethoxam, dinotefuran, flupyradifurone or cyanatraniliprole should be used preventatively in tomato and cucurbits.

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

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	fenpyroximate	G		G		
4A	clothianidin	F**				
Unk.	horticultural oil	F†		G		
Unk.	Azadiractin	F†				
Unk.	Soap, insecticidal	F†				

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

While whitefly populations remain low in most places, they can build up quickly, so growers should scout regularly to avoid being taken unawares later in the season. Preventative soil applications of either imidacloprid, thiamethoxam, dinotefuran, flupyradifurone or cyantraniliprole should be used preventatively in tomato and cucurbits.

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

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>

Diamondback moth

Growers and scouts are beginning to report finding diamondback moth larvae and pupae in cabbage and other crucifers from central Florida down to Homestead.

This insect has become increasingly difficult to control and in recent years, resistance to insecticides has become widespread, and includes most classes of insecticides including some Bt (*Bacillus thuringiensis*) products.

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.

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.

Larvae and pupae are often killed by one of several wasp parasitoids. Reduction of insecticide use, in particular pyrethroids and use of soft pesticides can sometimes improve diamondback control by favoring survival of natural enemies.

For insecticide recommendations, check UF/IFAS recommendations for currently labeled insecticides for diamondback larvae control in Florida crucifers.

Dr. Hugh Smith Entomologist at UF/IFAS GCREC indicates that rotations of Coragen, Proclaim, Radiant, Avaunt, have been effective. Hugh indicates that the Bts also have a place especially if you can use them early and often for the small larvae.

Silk fly

Respondents in the EAA indicate that silk fly adults are starting to show up in sweet corn in the Glades.

Reports indicate that silk fly numbers are increasing with the increase in alternate breeding hosts.

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.

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.

Broad Mite

On the East Coast, respondents indicate that broad mites are common in pepper.

Around SW Florida, broad mites remain sporadic in pepper and eggplant.

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

Spider Mites

Unusually dry weather this fall saw some spider mites showing up in cucurbits, eggplant and tomato.

Some problems with spider mites have also been reported in melons in Central Florida.

Pepper weevils

Growers and scouts report that pepper weevils are beginning to show up in peppers in multiple locations around South Florida and growers are targeting them.

Around Homestead pepper weevils are a major problem in growing 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.

Thrips

On the East Coast, thrips remain mostly low in pepper and are primarily Florida flower thrips.

Melon thrips populations remain high around Homestead and number have increased suddenly on beans and squash. Growers are reporting difficulty in bring them under control.

Bean also infested with bean thrips, *Caliothrips fasciatus*, and numbers are increasing. Common blossom thrips population is high in most bean fields with scouts reporting finding 4-6/flower. The adults cause damage by feeding and ovipositing on foliage.

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.

Diseases

Choanephora Blight

Growers and scouts report that Choanephora blight has become widespread on beans, squash and peppers around South Florida following October's wet weather and note that warm foggy mornings have kept it active.

Choanephora blight or wet rot, caused by the fungus *Choanephora* sp., is an occasional problem on vegetables in South Florida especially during the early fall during wet periods.

Symptoms are visible on apical growing points, flowers and fruits. Initially, water-soaked areas develop on leaves and leaf margins, leaf tips and apical growing points become blighted. Older lesions appear necrotic and dried out. Later the fungus grows rapidly downward causing dieback. The dark-gray fungal growth is apparent

on some lesions. Close inspection under magnification will reveal silvery, spine-like fungal structures and dark spores.

Symptoms may be confused with Phytophthora blight (*Phytophthora capsici*) when young or spray burn on bean plants with older symptoms.

A black soft rot can develop in fruit. Young squash fruit often develop a dark whiskery fungal growth on the blossom end before the fruit softens and rots

This fungus is a weak parasite; it colonizes dead or dying tissue before it actively invades living tissue.

The fungus may invade the old flowers and advance into the fruits. Spores may be dispersed by insects such as bees from flower to flower.

Infection can occur with or without wounding of host tissue caused by insects or mechanical means.

However, the disease may appear more frequently and with greater severity where such damage provides an entry point for the fungus.

Spores of the fungus can survive in the soil and in association with host plant debris.

Extended periods of rain, high humidity and high temperature favor fungal sporulation and disease development. The fungus is spread via wind and splashing water, and on clothing, tools and cultivation equipment.

There are few management techniques available, but broad-spectrum fungicidal sprays applied for the control of other diseases will provide some control of this disease as well. Good spray coverage where dense foliage occurs is important.

Dense plantings can lead to poor air circulation and extended periods of leaf wetness. Well-drained production sites and the use of drip irrigation rather than overhead irrigation will help decrease relative humidity and leaf wetness within a dense plant canopy.

Bacterial Spot

Around Immokalee, bacterial spot blew up in tomato especially in those fields where it had been established early and was present at low levels, even if it seemed dormant. The system that came through two weekends ago was the main culprit and then the subsequent warm humid weather and foggy mornings has kept it active. Fields that looked nice a few weeks ago are now starting to look blighted. Bacterial spot has also flared up in non-resistant pepper.

With recent rains, bacterial spot is showing up in specialty pepper and some young tomato on the East Coast.

In the Manatee Ruskin area, bacterial spot is becoming more widespread in tomato. Severity varies depending on the field and is generally worse in older fields.

Growers and scouts report that bacterial spot incidence around SW Florida, but incidence is mostly low, and remains significantly below normal for this time of the season. There have been a few confirmed reports of infected transplants coming from the plant house.

Around Homestead, bacterial spot is present in tomato and pepper.

Bacterial spot is one of the most serious diseases of tomato and pepper in Florida because it can spread rapidly during warm periods with wind driven rains, and because fruit symptoms reduce marketability.

Bacterial spot is caused by several species of *Xanthomonas* spp. Four species have been identified on tomato: *X. euvesicatoria*, *X. vesicatoria*, *X. perforans*, *X. gardneri*. In Florida, the major species encountered is *X. perforans*.

Symptoms of bacterial spot appear as small, water-soaked, greasy spots on infected leaflets. On tomatoes, distinct spots with or without yellowing occur. Individual leaf spots may coalesce with each other, resulting in the browning of entire leaflets. Fruit spots often begin as dark specks with or without a white halo. As spots enlarge, they become raised and scab-like.

Entry into the plant occurs through stomata or wounds made by wind driven soil, insects, or cultural operations. Bacterial spot can be seed transmitted, but most inocula comes from volunteer plants or infected plant debris in the soil. Temperatures of 75-87°F are ideal for bacterial spot but infections can occur at higher or lower temperatures.

***Xanthomonas perforans* is seed-borne, which allows for the movement of strains on a global scale.**

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. Temperatures of 75-87°F are ideal for bacterial spot but infections can occur at higher or lower temperatures.

Exclusion is the best means of managing bacterial spot on tomato. Unfortunately, even the best bactericidal treatment offers only limited protection when environmental conditions are favorable for rapid disease development, especially during periods of heavy, wind-driven rains.

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

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.

Bacterial blight

Low levels of bacterial blight are present on green beans in Homestead and Belle Glade.

Bacterial stem canker

Bacterial stem canker has been reported on some pepper on the East Coast in fields impacted by heavy rains a few weeks ago.

Target spot

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.

Dr Gary Vallad, plant pathologist at UF/IFAS SWFREC cautions growers to keep an eye out for target spot on tomatoes, as recent rains and 'cooler' temps favor disease development (temps >86°F greatly limit

growth and sporulation of *Corynespora*). Target spot typically starts in the inner canopy and may be overlooked until it is well established.

Scouts around Immokalee report that they are starting to see low levels of target spot showing up in early tomato plantings.

Target spot is also increasing in the Manatee Ruskin area and is present in Homestead as well.

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. Scouting is important to detect early signs of the diseases Growers are often taken by surprise as in the beginning of the season while we are still experiencing frequent rains they are targeting bacterial spot and then as the rains subside and canopies develop target spot emerges as a larger concern.

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.

Target spot is also causing some scattered problems in cucumber.
Consult UF/IFAS recommendations for currently labeled fungicides for target spot control in Florida vegetables.

Southern Blight

Growers and scouts around South Florida are reporting scattered problems with southern blight wilting down plants following recent rains.

Southern blight is caused by a soil-born fungus, *Sclerotium rolfsii* is a widespread problem in Florida's fall season. Typical symptoms include a whitish fungal growth develops around the base of plants at the ground line followed by wilting and sudden plant death as the fungus girdles the stem. Small seed-like structures (sclerotia) may be found within fungal mass. They are white at first and later turn dark brown to black.

The disease usually appears in "hot spots" in fields in early fall and continues until cooler, dryer weather prevails. Losses may vary from light and sporadic to almost total destruction of the crop.

Southern blight has a wide host range but is especially destructive on crops such as tomato, pepper, eggplant, beans and melons.

Sclerotia serve as the main survival structures and source of inoculum for disease. If the fungus finds ample organic matter and host plants, a large supply of sclerotia are produced for next year. These structures have a hard thick covering that resists weathering. Sclerotia may exist free in the soil or in association with plant debris. When buried deep in the soil, sclerotia may survive for up to a year, whereas those at the surface remain viable and germinate in response to decomposing plant material.

Since *S. rolfsii* does not produce spores, dissemination depends on movement of infested soil and infected plant material. Use of contaminated equipment and machinery may spread sclerotia to uninfested fields.

The fungus develops rapidly during hot weather when temperatures are over 85° F. *Sclerotium rolfsii* grows on living and non-living organic matter and becomes most severe when dead leaves or other types of organic matter are present around the base of the plant. This decaying organic matter provides the fungus with energy and allows it to grow quickly and rapidly kill the host plant.

High temperatures and moist conditions are associated with germination of sclerotia. Conditions in Florida's early fall favor disease development, a good rule of thumb is that the first moisture event (either rainfall or irrigation) following the first sustained 3-5-day period when temperatures exceed 95 ° F will signal the first severe outbreak of the disease. This stimulates germination of the sclerotia (seed-like structures) and furnishes needed moisture for fungal growth.

High soil moisture, dense planting, and frequent irrigation are all favorable to disease development.

Southern blight is difficult to control when conditions favor the disease and when numbers of sclerotia in the soil are high. Crop rotation with a non-susceptible grass crop such as corn is the most effective means of reducing numbers of sclerotia and resulting incidence of southern blight. Southern blight can be controlled with cultural and chemical techniques.

In rotations, growers should avoid planting tomato following highly susceptible crops such as peanut.

Deep incorporation of plant residues serves as a cultural control tactic by burying sclerotia deep in the soil. Residue management options will differ depending on what the previous crop was in a field. If the previous crop was a susceptible one, the previous crop should be well decomposed prior to planting, and this may require disking the field several times during the fallow period.

Soil fumigation with products containing chloropicrin can help reduce the incidence of southern blight.

Pythium

Pythium remains mostly low around South Florida

Growers around Belle Glade and Homestead are reporting some issues with Pythium causing some stand-loss on early planted beans especially where dry weather prompted the use of big gun irrigation to germinate seed.

Respondents around SW Florida are reporting some issues with Pythium in a few locations on peppers and squash. Incidence remains low to very low in most fields.

Phytophthora

Reports from the east Coast indicate that phytophthora is present at low levels in locations where it is traditionally a problem. Both eggplant and pepper have been affected.

Around Immokalee, phytophthora is showing up on pepper in squash.

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

Powdery mildew

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

Symptoms of the disease typically appear on older leaves and stems. The yields of crop are reduced due to pre-mature foliage loss. In melons severe leaf infection can result in lower fruit sugar content and subsequent reduction of fruit quality. In addition to reducing plant vigor from leaf infection, mildew can attack the calyx and reduce the marketability of fruit.

The fungus first appears as subtle, small, round, yellowish or whitish spots on leaves and sometimes stems. These spots enlarge and coalesce rapidly. As the white, fluffy mycelium grows over plant surfaces and

produces spores, it gives the lesions a powdery appearance resembling talcum powder, which is evident on the upper surface of older leaves or other plant parts. Young leaves are almost immune.

Heavily infected leaves appear dull and chlorotic and eventually become dry and brown. Extensive premature defoliation of the older leaves can occur if the disease is not controlled. Yield reduction from defoliation is proportional to the severity and length of time plants are infected.

Powdery mildew fungi can reproduce under relatively dry conditions. Increased humidity can increase the severity of the disease, and infection is enhanced during periods of heavy dew. Unlike downy mildew, powdery mildew can become severe during periods of low rainfall in the winter and spring months in Florida.

Crop rotation and many other cultural practices have little effect on the incidence and development of powdery mildew. It has been noted however, that healthy, vigorous leaves and stems are less prone to infection. Plants under nutritional stress in most cases will develop powdery mildew much sooner than plants the same age grown under a good nutritional program.

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.

Downy Mildew

Reports indicate that downy mildew pressure is increasing and cucumbers and across South Florida

Gummy stem blight

Very low levels of gummy stem blight are being reported on fall watermelons around Southwest Florida.

Southern Corn Leaf Blight

Respondents indicate that the incidence of Southern corn leaf blight is widespread 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. Mature foliar lesions can be rounded on the sides, but they tend to be parallel-sided, often restricted by the veins.

Lesions are light tan in the center with a reddish-brown border. A greenish growth near the center of the lesion may be evident if spores are present. Mature lesions range from 1/4 to 1 1/2 inches in length and may be tapered, flat or serrated on the ends.

Lesions caused by southern corn leaf blight are much smaller (up to 1/2 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*.

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. Fungal sporulation may be observed with a simple hand lens on foliar lesions following periods of high humidity.

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.

Although some control can be achieved by reducing inoculum using crop rotation and deep plowing of old crop debris, control of Southern corn leaf blight is best achieved with resistant varieties. Resistant varieties are available and should be considered, particularly for fall plantings.

Where resistance is lacking, spraying with fungicides may be necessary, particularly with sweet corn produced in peninsular Florida. Spray programs with recommended fungicides should commence at the first sign of disease if favorable weather is likely.

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.

Northern corn leaf blight

Northern corn leaf blight is also starting to show up on sweet corn in the EAA.

Tomato Yellow Leaf Curl Virus

Growers and scouts are reporting a marginal increase in the incidence of TYLCV as the season progresses. Disease incidence remains restricted mostly a few plants here and there in a couple of fields - are being reported on tomato around South Florida.

Tomato Chlorotic Spot Virus

Reports from Homestead report that symptoms consistent with tospovirus (believed to be TCSV) are starting to appear in some tomato fields.

A few symptomatic plants have also been reported in Palm Beach County.

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 similar to 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*)

Cucurbit Crumple Leaf Virus

Cucurbit crumple leaf virus is present on squash and melons around South Florida. Incidence and occurrence remain mostly low.

Cucurbit yellow stunting disorder virus

Scouts around Immokalee report finding low levels of cucurbit yellow stunting disorder virus on watermelon around Immokalee.

Bean red node

Respondents from Homestead report finding beans with symptoms of red node (caused by tobacco streak virus).

News You Can Use

October on pace to break heat records as cold fronts skip South Florida

October ended as the hottest on record with no significant cool front on the near horizon.

South Florida will end the month forsaken by significant cold fronts, a seasonal affront that ensured chances that many cities will experience their warmest October on record.

It's not that Old Man Winter hasn't attempted a foray or two into the tropics, but a bold Bermuda High is blocking the advances, forcing cold air incursions to sputter and stall before reaching much past Lake Okeechobee.

West Palm Beach's average temperature this month through Monday was 81.7 degrees, about 3 degrees above normal and enough to rank it tops in 127 years of records as the warmest October to date.

The average daily temperature for the month was an August-like 83 degrees, more than 6 degrees above normal, making it the hottest October on record. The previous hottest October averaged 80.4 in 2007.

The month closed as the warmest October on record at Miami, West Palm Beach, and Naples and very close to record at Fort Lauderdale.

PACA Can Help Protect Your Company

By Travis Hubbs
VSCNews
October 21, 2019

Since its foundation in 1930, the Perishable Agricultural Commodities Act (PACA) has been promoting fair trade practices in the fresh and frozen fruit and vegetable industry. In enforcing a code of fair business practices, the U.S. Department of Agriculture (USDA) resolved approximately 3,400 PACA claims involving more than \$58 million in the past three years alone. PACA staff also assisted more than 8,500 callers with issues valued at approximately \$151 million. These are recent examples of how USDA continues to level the playing field for vendors and growers. But it takes more than a rulebook to keep commerce flowing smoothly.

Working in partnership with the fruit and vegetable industry, PACA promotes fair trade practices through education, licensing, dispute resolution assistance and investigative enforcement. It also provides financial protection for industry members through the PACA Trust.

EDUCATION

PACA staff is ready and willing to assist businesses and answer questions through its customer service line at 800-495-7222. Additionally, information concerning PACA licensing, delivery guidelines, the PACA Trust, online training, and dispute resolution options are available on the PACA website at www.ams.usda.gov/paca.

LICENSING

PACA requires businesses that buy or sell wholesale quantities (i.e., 2,000 lbs.) of fresh or frozen fruits and vegetables to have a license. This includes shippers, wholesalers, brokers, retailers, processors and many e-commerce firms. Farmers are not required to have a PACA license unless they purchase wholesale quantities of produce from another grower or company. However, growers often obtain a PACA license in order to benefit from the financial protection afforded to licensees under the PACA Trust.

DISPUTE RESOLUTION SERVICES

The PACA Division provides industry members with a forum to settle commercial disputes. These creative options serve as an alternative to traditional legal proceedings, which are often time-consuming and expensive. Industry members are provided with alternatives such as filing informal complaints and/or participating in mediation facilitated by PACA staff.

ENFORCEMENT

Additionally, the PACA Division provides investigative enforcement to promote compliance through administrative actions against firms or individuals who are not trading fairly, and by stimulating payment of past-due produce debt back to the industry when circumstances permit. Licensees who violate the PACA may have their license suspended or revoked, and individuals determined to be responsibly connected to such licensees are restricted from being employed or operating in the produce industry for a set period of time.

PACA TRUST

Established in 1984, the PACA Trust affords sellers with financial protection if a customer declares bankruptcy or insolvency. Trust provisions place sellers of fresh and frozen fruits and vegetables into priority status when

their buyers experience business failure or file for bankruptcy protection. When a supplier sells produce to a buyer, the supplier, whether licensed or not, becomes eligible to participate in the PACA Trust. In the case of a business failure or bankruptcy, the debtor's trust assets are not available for general distribution to other creditors until all valid trust claims have been satisfied.

To preserve trust rights, it is important to know that payment terms must not exceed 30 days, and the necessary trust language must be conveyed to the customer. Anyone with a PACA license can conveniently place the official PACA Trust paragraph on the bottom of all invoices, which will preserve the seller's rights on every transaction. Sellers not licensed under the PACA, or licensees who do not include the statutory wording on invoices, must provide written notice to their customers conveying their notice of intent to preserve PACA Trust benefits on that particular transaction.

Since its inception, hundreds of millions of dollars have been paid to qualified produce creditors under the PACA Trust provision. In case of a buyer's insolvency, the PACA Trust protects growers as secured creditors by providing legal protection in a suit and a means for recovery of damages.

CONTACT PACA

PACA experts are ready to assist companies with problems unique to the industry, such as interpretation of inspection certificates, advice on contract disputes and bankruptcy issues. Representatives are available Monday through Friday from 7:00 a.m. until 7:00 p.m. Eastern Standard Time to provide information and respond to questions. Call 800-496-7222 and select option 2.

Travis Hubbs is chief of the Investigative Enforcement Branch of the Perishable Agricultural Commodities Act Division of the U.S. Department of Agriculture. <http://vscnews.com/paca-can-help-protect-your-company/>
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, and at the UF/IFAS SW Florida Research and Education Center in Immokalee.

Up Coming Meetings

Produce Food Safety Workshops: Fall 2019

Produce Safety Alliance Grower Training

This is the one-day course for fruit and vegetable growers and packers who fall under FSMA's Produce Safety Rule. FDA and PSA are very sensitive about how this course is advertised and promoted as the standardized curriculum. Even though there are currently no other recognized alternative courses to satisfy the training requirements of the Produce Safety Rule, they do not want us to say the course is required or mandated or anything like that...even though, by default, it kind of is. This is the "approved" advertising language from PSA:

WHO SHOULD ATTEND: 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.

WHAT TO EXPECT: The trainers will spend approximately seven hours of instruction time covering content contained in these seven modules:

- 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)
- Postharvest Handling and Sanitation
- How to Develop a Farm Food Safety Plan

In addition to learning about produce safety best practices, key parts of the FSMA Produce Safety Rule requirements are outlined within each module. There will be time for questions and discussion, so participants should come prepared to share their experiences and produce safety questions.

BENEFITS OF ATTENDING: The course will provide a foundation of Good Agricultural Practices (GAPs) and co-management information, FSMA Produce Safety Rule requirements, and details on how to develop a farm food safety plan.

After attending the entire course, participants will be eligible to receive a certificate from the Association of Food and Drug Officials (AFDO) that verifies they have completed the training course.

Here's the list of upcoming PSA courses.

- 11/18/19-Belle Glade <https://psa111819.eventbrite.com>

Preventive Controls for Human Food Preventive Controls Qualified Individual (PCQI) Training

HACCP for Florida Fresh Fruit and Vegetable Packinghouses This two-day course is not a requirement of FSMA rules, but may be required by some third party audit schemes

- 11/19/19 – 11/20/19 – Belle Glade <https://haccp111919.eventbrite.com>

All workshops require advanced registration. <https://crec.ifas.ufl.edu/extension/events/> Registration questions?

Questions? - Contact Sarah McCoy at sarahmccoy@ufl.edu

Beyond Basic Produce Food Safety: A Hands-On Analysis This one-day course is targeted at those who have already attended a food safety training and are looking for a more in-depth and hands-on experience. It is not a substitute for a PCQI or PSA Grower Training for FSMA.

- 11/12/19 – Naples <https://beyondbasicproducefoodsafetycollier.eventbrite.com>

Produce Safety Alliance Train-the-Trainer This two-day course is for those interested in becoming PSA Trainers

- 12/11/19-12/12/19-Apopka <https://psattt121119.eventbrite.com>

November 7, 2019 EREC Open House - Growing with Nature 8:00 am – 3:00 pm

UF/IFAS EREC
3200 E. Palm Beach Road
Belle Glade, FL 33430-4702

Register online with Eventbrite: <https://www.eventbrite.com/e/open-house-tickets-60942906875>

November 13, 2019 Localecopia Meet & Greet

2:00 pm – 4:00 pm

The Breakers Palm Beach (www.thebreakers.com).
One South County Road
Palm Beach, Florida 33480

This an opportunity to bring together local producers and consumers. Attendance is free of charge and the hospitality community, schools, producers, home consumers, and other like-minded individuals are encouraged to attend this unique event.

Learn more about Localecopia and the Localecopia Marketplace: <https://localecopia.org/>

November 14, 2019 SWFREC Open House – Before the Bounty

10:00 am – 2:00 pm

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

Open to the public – tours of fields and labs – come and find out about the cutting-edge agricultural research happening in Immokalee

RSVP – 239-658-3415 or email jderleth@ufl.edu

November 18, 2019 Unmanned Aerial Vehicle Spray Drone demonstration

2:00 pm

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

To register, call 239-658-3400 or email Jennifer Derleth at jderleth@ufl.edu

November 19-20, 2019 Farm Labor Supervisor Training

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

For schedule and registration information, click here:

https://swfrec.ifas.ufl.edu/docs/pdf/economics/SWREC_FarmLaborSupervisorTrainingProgramFlyer2019.jpg

November 21, 2019

Florida Ag Expo

7:30 a.m. – 5:00 p.m.

Gulf Coast Research and Education Center
14625 Co Rd 672
Wimauma, FL 33598

Register - <https://tmp.wufoo.com/forms/z5m7tdg0jivjtn/>

December 16, 2019 Discussion of Local Agricultural Issues with Legislators 1:00 pm—3:00pm

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

1:00 – Welcome, Dr. Kelly Morgan, Center Director

1:10 – Success of the Best Management Practices Program in the Everglades Agricultural Area – Dr. Samira Daroub, Professor, Soil and Water Sciences, Everglades Research and Education Center, Belle Glade

1:30—Payment of Environmental Services in Northern Everglades Associated with Dispersed Water Storage – Dr. Sanjay Shukla, Professor, Agricultural and Biological Engineering, Southwest Florida Research and Education Center, Immokalee

2:00— Next Step in BMP research and Implementation – Mr. Christopher Pettit, Director, Office of Agricultural Water Policy, Florida Department of Agriculture and Consumer Services, Tallahassee

2:20 – Grower Panel Discussion and Questions

2:40 – Discussion Led by Legislators. Expected to attend: Senator Ben Albritton, Representative Bob Rommel and Representative Byron Donalds.

3:00 Adjourn

CEUs will be available. Pre-registration is requested.

To register, call 239-658-3400 or email Jennifer Derleth at jderleth@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 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>

The Last Harvest - Check out Driscoll's award-winning video at <http://www.thelastharvestfilm.com/>
More than 75% of fresh fruit in the U.S. is hand-harvested. Critical labor shortages are forcing farmers to abandon valuable crops. Our food system and communities need solutions.

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>

Contributors include: Joel Allingham/AgriCare, Inc, Dr. Ozgur Batuman/ SWFREC, Gordon DeCou/Agri Tech Services of Bradenton, Dr Nick Dufault/ UF/IFAS, Jason Dyess/Agriquest, Inc., Rachel Giles, Carrie Harmon/UF/IFAS Plant Disease Clinic, Lisa Hickey/Manatee County Extension, Bruce Johnson/General Crop Management, Barry Kostyk/SWFREC, Leon Lucas/Glades Crop Care, Chris Miller/Palm Beach County Extension, Mark Mossler/UF/IFAS Pesticide Information Office, Gene McAvoy/Hendry County Extension, Alice McGhee/Thomas Produce, Dr. Gregg Nuessly/EREC, Chuck Obern/C&B Farms, Dr. Jawad Qureshi, SWFREC Dr. Rick Raid/ EREC, Dr Pam Roberts/SWFREC, Wes Roan/6 L's, Dr. Dak Seal/ TREC, Kevin Seitzinger/Gargiulo, Kevin Short/ICM, Dr Gary Vallad/GCREC , Mark Verbeck/GulfCoast Ag, Dr. Qingren Wang/Miami-Dade County Extension, Alicia Whidden/Hillsborough County Extension, Dr. Phillip Williams/SWFREC, Dr Henry Yonce/KAC Ag Research and Dr. Shouan Zhang/TREC.

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

Gene McAvoy

Gene McAvoy

Associate Director for Stakeholder Relations

University of Florida IFAS Southwest Florida Research and Education Center

Regional Vegetable Extension Agent IV Emeritus

UF/IFAS SWFREC
2685 State Road 29 N
Immokalee, FL 34142

239-658-3414
863-673-5939 cell
gmcavoy@ifas.ufl.edu

Chris Miller

Dr. Christian Miller, Extension Agent II
Vegetable & Tropical Fruit Production
Palm Beach County Extension
559 North Military Trail, WPB, FL 33415

Phone: 561-233-1718
Email: cfmiller@ufl.edu
Web: <http://discover.pbcgov.org/coextension/Pages/default.aspx>

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Thomas Produce Company

Of South Florida
Grower and Shippers of Quality Vegetables
9905 Clint Moore Road
Boca Raton, Florida 33496

Shawn Barley

Wedgworth's Inc.
Big W Brand Fertilizer
(863) 441-9255 cell

Carol Howard

Mobley Plant World
1351 W Cowboy Way
LaBelle, Florida 33935
Phone 863-675 -2020

Ryan Richards

Wedgworth's Inc.
710 Broward Street
Immokalee, FL 34142
Phone 239-657-8254 Fax 239-657-2005

Gargiulo

Growers Shippers Importers Exporters
David Pensabene: Production Manager
Naples Operations
Phone 239-353-0300 Fax 239-353-3407

Nichino America

Makers of Courier, Portal & Vetica
Technical Sales Representatives
Todd Villars: West Florida - 863-532-0937
Sam Monroe: East Florida - 772-473-0873

Dr. Nancy Roe

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

Ed Early

DuPont Crop Protection
Fort Myers, Florida 33911
Mobile 239-994-8594

Glades Crop Care, Inc.

**Leaders in Crop Health
Management**
Charlie Mellinger, Ph.D.
Phone 561-746-3740 Fax 561-746-3775

Stacey Howell

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

Justin Powell

Southeast Business Leader
Adama
229 881 9757 cell
justin.powell@adama.com

Bart Hoopingarner

Gowan Company
3605 162nd Ave East
Parrish, FL 34219
Phone 941-776-1105 Cell 941-737-7444

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Morgan McKenna
Fort Myers, FL 33901
Cell 336-337-2085

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Safe Natural Effective
Vegetable Bacteria Control
Matt Stephenson Smith – 239-572-3342
Ryan Benson – 801-300-3437

Dave Owens
Marrone Bio Innovations

Cell 239-233-9073 or
dowens@marronebio.com

Brent Beer
***Beer Leveling &
Land Development***

Office 863-675-1663 863-673-3173 cell
158*17*43857 Nextel

Certis USA
Bio-Pesticides for Crop Production

Joe Craig - 863-291-9203
Chuck Goodowns - 352-538-4471

Scott Houk
Dow AgroSciences LLC

Phone 239-948-3999
Email sehok@dow.com

FMC
FMC Corporation

Eric Johnson
Cell 352-281-2325

EJ.Johnson@fmc.com www.fmccrop.com

Steve Mike Dave

Jamerson Farms

Growers, Packers and Shippers of
Florida's Finest Vegetables
Phone 239-229-5734 Fax 239-368-0969

Sarah Hornsby, CCA
Agricultural Crop Consulting, Inc

Scouting: Manatee, Hillsborough, Collier
Office/Fax 941-776-1122
Cell 941-713-6116
Email: AgCropCon@aol.com

Donald Allen
AGLIME SALES INC

PO Box 60
Babson Park, Florida 33827-0060
Office 863-638-1481 Fax 863-638-2312
Mobil 863-287-2925

BioSafe Systems LLC

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Jarod Huck
352-789-9363

Luis Hansen
305.793.9206

info@biosafesystems.com

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BASF Corporation

Adrian Jahna
863-443-2404
Adrian.jahna@basf.com



Certified for use in Organic Production
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g8trmanjek@comcast.net

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bsapp@oroagri.com
CPS/Howards/Triangle

Chuck Obern

C & B Farm

CR 835
Clewiston, FL 33440
Office 863-983-8269 Fax 863-983-8030
Cell 239-250-0551

Scott Allison

Diamond R Fertilizer

PO Box 1898
LaBelle, FL 33975
(863) 675-3700
sagator@aol.com

Arysta Life Science

Richard Royal 352 434-8774
Shaun Yule 386 561 0493

Richard Roles

Roles Marketing International

Distributors of Agrigro and Super
Cal 10% Calcium
richard@rmiint.com www.rmiint.com
Cell 561-644-3511

Dr. Henry Yonce

KAC Agricultural Research

Scouting, Consulting
Research
386-736-0098 work 386-527-1124 cell
HDYONCE@msn.com

Grower's Management, Inc

P.O. Box 130
Belle Glade, FL 33430
Phone: 561-996-6469
www.growersmanagement.com

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