2017 Florida Plant Disease Management Guide: Squash[1]

Pamela D. Roberts[2]

Specific Common Diseases

Angular Leaf Spot (*Pseudomonas syringae* pv. *lachrymans*/*Pseudomonas syringae*)

Symptoms: Symptoms occur on the leaves, stems, and fruit. Spots in the leaves are angular, and water-soaked. These spots of dead tissue will occasionally drop away from the healthy tissue leaving holes in the leaves. This is a cool weather disease.

The spots on the fruit are generally smaller and nearly circular. The dead spots on the fruit turn white and the tissue may crack open. Wet, cool weather favors this disease. The bacterium is seedborne and dispersed by rain or irrigation water.

Cultural Controls: Plant disease-free seed. Rotate land away from cucurbit crops. Do not work diseased plants when they are wet.

Chemical Controls: See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, "Cucurbit Production" (http://edis.ifas.ufl.edu/cv123).

Damping-off (*Pythium* spp. and *Rhizoctonia solani*)

Symptoms: Seed fails to germinate due to rapid colonization of seed by soilborne fungi and fungal-like organisms. Excavated seed will be rotted and soft often with evidence of fungal mycelium. Young, newly emerged seedlings often collapse at soil line and crown. The stems may exhibit an obvious discoloration ranging in color from a reddish-brown to black and may be dry or mushy to the touch depending on the pathogen involved.

Cultural Controls: Avoid planting seed when soil moisture, soil preparation, temperature, or planting depth do not favor rapid emergence. Plant in well tilled soil where old crop debris had been destroyed 30 days previously.

Chemical Controls: Use a fungicide seed treatment. See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, "Cucurbit Production" (http://edis.ifas.ufl.edu/cv123).

Downy Mildew (*Pseudoperonospora cubensis*)

Symptoms: Symptoms appear on the foliage as pale-green to yellow, angular spots, with gray-tinged spore masses on the undersides of these spots. Severely infected leaves become chlorotic, turn brown, and shrivel. The fruits are rarely affected directly, but fail to color properly and are usually sunburned and tasteless. Spores are readily wind dispersed. See *Management of Cucurbit Downy Mildew in Florida* (http://edis.ifas.ufl.edu/pp325).

1. This document is PDMG-V3-49, one of a series of the 2009 Florida Plant Disease Management Guide, Department of Plant Pathology, UF/IFAS Extension. Revised December 2005 and June 2017. Please visit the EDIS website at http://edis.ifas.ufl.edu. Originally published as 2009 Florida Plant Disease Management Guide: Squasy by Pamela Roberts and Tom Kucharek (http://ufdc.ufl.edu/IR00006734/00001).

2. Pamela D. Roberts, professor, Plant Pathology Department, Southwest Florida Research and Education Center, Immokalee, FL.

Chemical Controls: Initiate a fungicide spray program in advance of disease occurrence. See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, "Cucurbit Production" (http://edis.ifas.ufl.edu/cv123).

Gummy Stem Blight (*Didymella bryoniae*)

Symptoms: This fungus can cause damping-off, crown and stem rot, leaf spots, and fruit rot on winter squash. Infection can begin on seed leaves but usually occurs on the older leaves closest to the soil line. Lesions are round to irregular, brown, and sometimes concentrically zoned. In Florida, this disease is found in fruit as black surface lesions.

Stem or vine lesions are brown, often splitting open and turning light colored with age. The black, speck-like fruiting structures (pycnidia) can often be seen in these stem or vine cankers. Lesion enlargement may girdle the stem or vine causing death.

The pathogen can be seedborne but often survives in previous crop debris. Spread is achieved by rain splashing and strong winds. See *Management of Gummy Stem Blight (Black Rot) on Cucurbits in Florida* (http://edis.ifas.ufl.edu/pp280).

Chemical Controls: Plant only fungicide-treated seed. Avoid planting in field with residual crop debris still present. Apply fungicides as needed. See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, "Cucurbit Production" (http://edis.ifas.ufl.edu/cv123).

Phytophthora Blight (*Phytophthora capsici*)

Symptoms: Yellow squash are particularly susceptible to Phytophtora blight and the entire plant can collapse. The disease can occur on the plant at any stage causing damping-off, seedling blight, foliar blight, and plant death preceded by wilting. Symptoms on mature plants are seen as dark, water-soaked areas in the crown. Leaf spots are rapidly expanding, water-soaked lesions. Infection of the plant, particularly summer squash, leads to rapid death. Sunken, brown water-soaked areas appear in infected fruit. A white growth may cover the lesion and sporangia can be readily recovered. Sporangia are rain-splashed dispersed or by moving infested soil or contaminated equipment. Surface moisture is required by the swimming zoospores for infections. Standing water in fields is an ideal situation for occurrence of this disease if inoculum is present is the soil. See *Vegetable Diseases Caused by* Phytophthora capsici *in Florida* (http://edis.ifas.ufl.edu/vh045).

Cultural Controls: Plant in well-drained soils and avoid waterlogged conditions. Do not move plants or equipment from infected fields to non-infected fields. Avoid fields known to have had this disease because the pathogen can survive for many years in the soil.

Chemical Controls: Use a soil fumigant. See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, "Cucurbit Production" (http://edis.ifas.ufl.edu/cv123).

Powdery Mildew (*Podosphaera xanthii*)

Symptoms: This disease affects the leaves and stems, first appearing as round whitish spots on the upper or lower leaf surfaces. The spots increase in number and size, coalesce, and appear on the upper surface as a white, powdery growth. Severely affected leaves lose their normal dark-green color and become pale yellow-green, then brown and shriveled. Also, the young stems are killed. Fruits on infected vines ripen prematurely, are of poor quality, and often sunburn. Spores are readily wind-dispersed over long distances.

Chemical Controls: Apply fungicides as needed. See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, "Cucurbit Production" (http://edis.ifas.ufl.edu/cv123).

Viruses Viruses (*Cucumber mosaic virus*, *Papaya ringspot virus Type W*, *Watermelon mosaic virus 2*, and *Zucchini yellow mosaic virus*)

Symptoms: Young infected plants may exhibit prominent vein clearing, chlorotic spotting, and a mosaic on leaves. Older plants may exhibit stunting with varying degrees of mottling, leaf blistering, and malformation and vein extension along leaf borders depending on the strain of virus, age of infection, and possibly other factors.

Yellow squash varieties will exhibit varying degrees of fruit greening in a striped or mottled pattern, sometimes with raised yellow blisters. Green-fruited squash may lighten or mottle in color as well as blister. Fruit distortion can be severe across squash types.

This virus is spread by aphids from weed hosts within Florida. Common weed hosts include the creeping cucumber or melonette (*Melothria pendula*) in south Florida and alyce clover (*Alysicarpus* sp.) farther north in the state. Dayflower (*Commelina* sp.) is a major host for cucumber mosaic virus.

Cultural Controls: Do not grow squash behind or adjacent to other cucurbit crops since these viral diseases affect all cucurbits. Isolation of squash fields may limit aphid buildup from other crops and use of noncrops (solanaceous crops) as buffer fields should reduce field to field spread. Control weeds prior to cropping. Use of JMS Stylet Oil on a schedule can reduce losses to virus. See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, "Cucurbit Production" (http://edis.ifas.ufl.edu/cv123) for use of JMS Stylet Oil. Certain varieties of yellow summer squash and zucchini squash have resistance to some of these viruses.

Wet Rot (Blossom Rot) (*Choanephora cucurbitarum*)

Symptoms: This disease affects the blossoms and fruit. The infected part rapidly becomes covered with a mass of whisker-like, white-stalked, black-headed fruiting bodies of the causal fungus. The tissue beneath this mass of fungus becomes water-soaked and rotted. During dry periods, fruit may rot back from the blossom-end without the characteristic fungus growth present.

Cultural Controls: Occurrence of blossom-end rot may predispose fruits to invasion by this weak pathogen. Use of fungicides in the control of other diseases may aid in the control of wet rot. Minimize crowding of plants and control weeds; these practices enhance air circulation. In gardens, removing the spent corolla (flower) after successful pollination will control this fungal disease on those fruit.

Whitefly Transmitted Viruses (*Squash vein yellowing virus, Cucurbit leaf crumple virus, Cucurbit yellow stunting disorder virus*)

Symptoms: Symptoms of *Squash vein yellowing virus* are distinct in squash and much different than in watermelon. The leaves of infected plants have yellowing along the leaf veins. Plants can be stunted. Fruit may have green streaks.

Symptoms of *Cucurbit leaf crumple virus* are leaf distortion and yellowing and crumpling of leaves. Leaves of yellow squash showing are distinctly rounded but zucchini leaves are not. The fruit from infected yellow squash have green streaks.

Symptoms of *Cucurbit yellow stunting disorder virus* are mild and may resemble nutritional disorder or water stress. The first symptom is a yellow spotting of leaves and the veins remain green.

Cultural controls: Practices to reduce the number of whiteflies in the crop such as not planting new crops near older crop fields, destroying the crop completely at the end of the season, and eliminating weed hosts are recommended. For a complete list of recommended cultural control methods see *Recommendations for Management of Whiteflies, Whitefly-Transmitted Viruses, and Insecticide Resistance for Production of Cucurbit Crops in Florida* (http://edis.ifas.ufl.edu/in871).

***Chemical Control*:** Managing the whitefly vector is recommended to limit virus spread. For management of the whitefly vector, see *Insect Management for Cucurbits (Cucumber, Squash, Cantaloupe, and Watermelon)* (http://edis.ifas.ufl.edu/in168).