



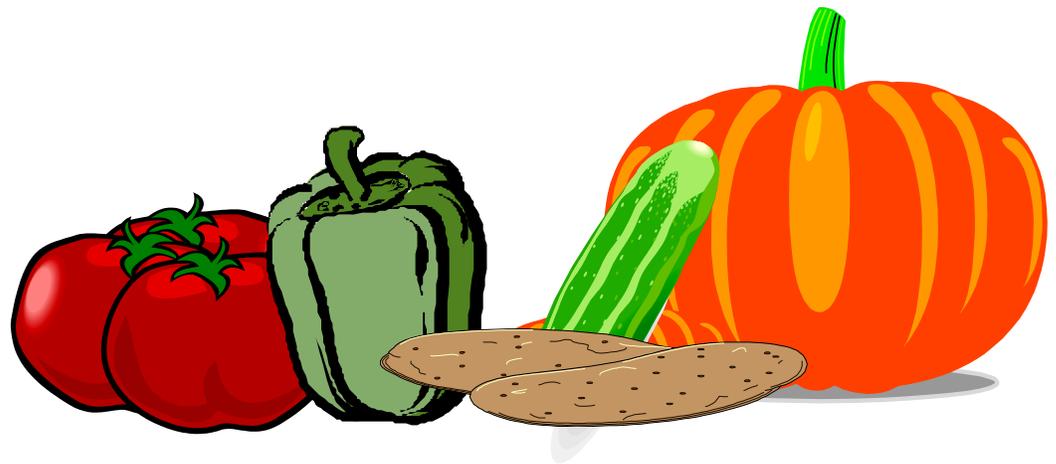
CAYMAN ISLANDS
DEPARTMENT OF AGRICULTURE
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Common Pests of Vegetable & Root Crops in the Cayman Islands

**Information
About ...**

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Name: Okra (*Abelmoschus esculentus*)

Disease: Powdery Mildew

Primary cause: A Fungus (*Oidium sp. Erysiphe cachoracearum*)

Symptoms of Infection: Infected leaves have a white, powdery appearance on both the upper and lower surfaces. In the advanced stages of the disease the plants become withered and dry.



Recommended Control: Avoid planting okra in low-lying and shady locations where the relative humidity is high since such conditions are very favourable for the growth and development of the fungus. During planting, care should be taken to use planting distances that will ensure adequate air circulation within the field. All crop residues and weeds should be removed from the field after harvesting. Weekly applications of a fungicide (e.g. Triple Action Neem) may be used to prevent the development of Powdery Mildew especially during periods of prolonged, heavy rainfall.

Name: Callaloo (*Amaranthus viridis*)

Pest: A moth (*Spoladea recurvalis*)

Signs and Symptoms of Infestation: Shot holes and notches can be seen in the leaves. These are made by tiny caterpillars, the feeding stage of the moth. The caterpillars resemble small, green worms and can be found hiding on the lower surface of the leaves. Webbing and frass (caterpillar droppings) may also be observed on leaves.



Recommended Control: Callaloo fields should be scouted regularly to detect early signs of insect damage. Maintain good weed control within and around the crop to remove alternate host plants of the pest. Often abandoned Callaloo plants growing close to the crop serve as good source of the pest. Where infestation occurs, applications of an insecticide (e.g. Dipel) usually provide good control.

Name: Pepper (*Capsicum sp.*)

Pest: Root Knot Nematode (*Meloidogyne incognita*)

Symptoms of Infestation: These microscopic, soil-inhabiting worm-like organisms burrow into the roots of pepper plants. They feed on the tissues causing swollen galls to form on the roots. Groups of pepper plants through-out the field lose vigour and become wilted even when there is adequate moisture in the soil. Infested roots rot and the whole root system becomes scanty.



Recommended Control: In fields where the soil is known to have high levels of root knot nematodes the soil should be treated with a nematicide (e.g. Vydate L) before planting pepper seedlings. However, nematicides are usually extremely toxic chemicals and therefore other recommended non-chemical control measures include crop rotation, selection of healthy planting material, ***soil solarisation** and the use of resistant varieties. Good farm hygiene can be used to prevent the spread of the nematodes from infested plants to healthy plants or from one field to another. For example, tools that have been in contact with infested soils should be sterilised by washing in a 2% bleach solution.

***Soil solarisation** is a simple, non-chemical technique which captures radiant heat energy from the sun and uses it to greatly reduce pest levels in soil and thereby allowing successful production of crops.



How to solarize your soil

- 1 Till the soil and remove rocks and lumps of debris
- 2 Soak the area with fresh water
3. Cover with clear polyethylene tarp and leave for six to eight weeks.

Solarization of individual garden plots

Name: Cassava (*Manihot esculentum*)

Pest: Cassava green mite (*Mononychellus caribbeanae*)

Signs of infestation: Nymphs and adults of the mite infest and feed on the underside of leaves causing a whitish speckling visible on the upper leaf surface. Infested leaves fall off prematurely.

Recommendation Control: A predator beetle, *Oligota sp.*, occurs naturally in the Cayman Islands. The larvae of this beetle feed on the Cassava Green Mite, thereby giving some level of control. When severe mite outbreak occurs, especially during dry season, chemicals (acaricides) may be applied to the crop. Care should be taken to ensure that the pesticide is directed to the underside of the leaves. Two applications in a 7-10 day interval of Cure or Vertimec—a miticide, are usually adequate to give good control.



Cassava green mite eggs and active stages.



Yellow spotting caused by cassava green mite feeding.

Name: Sweet potato (*Ipomoea batatas*)

Pest: Sweet potato weevil (*Cylas formicarius*)

Signs of infestation: Small holes approximately 1 mm in diameter in the vines and storage roots. The tunnels usually contain the legless larva of the weevil. The tissues around the tunnels darken and rot. Affected roots have an unpleasant smell because of the terpenoid produced by the plant in response to the pest attack. Damaged roots are inedible because of their bitter taste. In the field, the adult, a reddish ant-like weevil, can be seen easily with the naked eye..



Recommended Control: Simple cultural techniques mass trapping using pheromone usually gives very good control. Practice crop rotation (i.e. avoid planting sweet potato in the same plot of land season after season). Remove infested storage roots from the field and disinfect by boiling to destroy the grubs. Use sweet potato cuttings (slips) taken from the youngest end of the vine, for planting rather than the storage root which may be infested with grubs. Treat slips with an insecticide such as Caprid before planting. Mound soil over the roots in the field to protect them from weevils. Harvest storage roots early. Examine potatoes carefully and store only those that are free of the weevil or its larvae.

Name of Crop: Yam (*Dioscorea sp.*)

Name of Disease: Anthracnose

Primary cause: A fungus (*Colletotrichum sp.*)

Symptoms: Large black rotted (necrotic) areas on the leaves and vines. The tips of affected vines usually die-back and growth of the plant is greatly restricted. The disease is more severe on un-staked yams especially those growing in wet or moist areas. The lesions drastically reduce the green food making (photosynthetic) area of the leaves resulting on small tubers and poor yield.



Recommended control: The White Yam (*D. alata*) of the Cayman Islands is very susceptible to anthracnose disease. However, the disease can be controlled by using a combination of non-chemical and chemical control measures.

Non-chemical control measures:

- Burn all crop refuse from disease affected plots.
- Practise crop rotation (i.e. Avoid planting yams in the same plot of land season after season).
- Maintain an excellent weed control programme.
- Select and plant only good quality, healthy-looking materials from disease free plots.
- Scout the field regularly for early detection of the disease.
- Harvest tubers carefully to prevent any damage.

Chemical control measures:

- Before planting, dip all planting material in a cocktail mixture of Manzate at 2 teaspoons/ gallon and Vydate L at 1 tablespoon/ gallon).
- During the growth period, yam vines and leaves can be protected against infection by the timely application of selected fungicides as set out in the Department of Agriculture's recommended spray programme.

Name: Tomato (*Lycopersicon esculentum*)

Disease: Tomato Yellow Leaf Curl Virus (TYLCV)

Vector: Whiteflies – TYLCV is a whitefly-transmitted disease

Symptoms of Infection: The apical leaves become yellow, leaf margins curl upwards and the plant becomes stunted. The effect of TYLCV on the fruits depends upon the age of the plants when infection occurs. Since the dropping of flowers is a common reaction, early infection produces very few fruits. When infection occurs at a late stage of development of the plant, additional fruits fail to set, but fruits already present will ripen in a nearly normal manner.



Recommended Control: There is no known curative treatment for TYLCV. Hence, if young plants become infected they should be removed and destroyed. The management strategies for preventing the disease are aimed at keeping the population of whitefly vector in the field as low as economically possible. Such measures include:

- Planting tomatoes during the cooler months of the year, October to January, to avoid periods when the population of whitefly is high.
- Planting only those tomato varieties with the highest tolerance/resistance to the virus.
- Practising good weed control within and around the tomato field. Milkweeds serve as a very good virus source.
- Preventing the build-up of whitefly population by interplanting the crop with marigold, escallion leeks, and/or shallot
- Controlling high populations of the whitefly with carefully selected insecticides such as Padan or Confidor rotated with M-pede.

Cucurbits



Cucurbits belong to the family of plants known as **Cucurbitaceae** and include the following:

Cucumber, Melon, Pumpkin, Cantaloupe,
Squash and Watermelon

Disease: Alternaria Leaf Blight

Primary cause: A fungus (*Alternaria cucumerina*)

Symptoms of Infection:

Small, circular, tan spots with a white centre appear on the upper surface of the infected leaves. These spots enlarged, turn light brown and sunken. Veins within the spots become dark. Other spots with concentric rings may also be observed on the upper surface. A heavy infection causes defoliation, which results in sunburn damage during the hot, dry season. Fruit infection is also common. Infected fruits develop brown, sunken spots.



Recommended Control: One year crop rotation out of Cucurbits and the use of tolerant varieties provide very good control of Alternaria Leaf Blight. Warm temperatures and moisture from dews, rain and overhead irrigation favour the disease development. When these conditions exist, application of a fungicides such as Dithane or a Copper based fungicide (e.g. Tri-basic Copper or Liquid Copper) can help to prevent the fungal attack.

Disease: Downy Mildew

Primary cause: A Fungus (*Pseudoperonospora cubensis*)

Signs and Symptoms of Infection: The fungus infects the leaves of the plant. The earliest symptom appears as irregularly shaped, yellow spots on the upper surface of the leaves. The spots quickly turn brown. During rainy weather a purplish, fungal growth can be seen on the lower surface of leaves to coincide with the brown patches. These spots increase in size rapidly causing withering of the leaves. Fruits of infected plants are usually small and of poor flavour.



Recommended Control: Avoid excessive watering of the field. All crop residue and weeds should be removed from the field. During prolonged, rainy weather weekly applications of the fungicide (e.g. Ridomil or Liquid Copper) can be used to protect the plant from infection.

Pest: A moth (*Diaphania hyalinata*)

Signs and Symptoms of Infestation: Shot holes and notches can be seen in the leaves. These are made by tiny caterpillars, the feeding stage of the moth. Caterpillars resemble small, green worms and can be found hiding on the lower surface of the leaves. Webbing and frass (caterpillar droppings) may also be observed on leaves.



The moth caused by the

(*D. hyalinata*)



Caterpillar of the moth



caterpillar

Damage

Recommended Control Measures: Scout the field regularly by checking the underside of leaves to detect caterpillar damage. Maintain good weed control in and around the crop to remove alternate host plants. Where infestation occurs, application of an insecticide (e.g. Dipel or Sevin) will provide good control.