Chemical Control

- Foliar spray Insecticidal soaps (such as M-pede), Soluble spray oil, Ultra-fine spray oil, Neem oil and Volck oil can be effective control methods for homeowners with slightly infested plants. It is important to provide good coverage of the spray mix to the stems and underside of leaves. It will be necessary to repeat applications every 7-10 days until control is achieved. These products are less detrimental to beneficial insects.

- For heavy infestations or 'hot spots' other insecticides may have to be used to bring the Croton scale populations under control. Foliar applications of systemic insecticides such as Actara (Thiamethoxam), Confidor 79WG (Imidachloprid) and Talstar (Bifenthrin) are recommended for use.

These insecticides should be applied by trained applicators and in ALL CASES READ AND FOLLOW THE LABEL. DO NOT USE the same chemical in repetition. Chemicals should be rotated to prevent build up of resistance to the pesticides.

Recommendation for nurseries:

- Monitor all plants for early signs of Croton scale infestation. Remember that all the susceptible plants are still not known.
- Include chemicals such as Talstar (Bifenthrin), Merit (Imidachloprid), Actara (Thiamethoxam), Caprid (Acetamiprid) and the spray oils listed above in the existing nursery spray programme. Soil drenches or applications of granules to soil are recommended. Foliar applications should be used when Croton scale populations are high for quick knockdown. Rotate insecticides with different modes of action. This is critical to the effective management of the Croton scale and to prevent the build-up of pesticide resistance. If plants receive a soil drench of any of the group of neonicotinoid insecticides (imidacloprid, thiamethoxam, clothianidin, dinotefuran) **DO NOT** apply a foliar spray with another insecticide in this group.

ALL PESTICIDES ARE POISONS
PLEASE READ AND FOLLOW THE LABELLED INSTRUCTIONS CAREFULLY

Recommendation for Farmers:

Fruit trees infested with Croton scale become weakened and do not produce at their full potential. Scout regularly for early detection of the pest. Look out for honeydew, ants visiting to feed on the honey dew and sooty mold.

If infestation occurs include chemicals such as Actara (Thiamethoxam), Caprid (Acetamiprid) in rotation for fruit trees and food plants. The use of low toxicity chemicals such as soluble spray oil and Volck oil can be used where infestation levels are slight. Remember to observe the labelled days to harvest...

Caprid 7 days to harvest; Actara 10 days to harvest

Croton (*Codiaeum variegatum*)

For more information
and advice on Croton scale
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(Photograph credit: Lyle Buss, University of Florida)

Croton Scale

Phalacrococcus howertoni
(Hodges and Hodgson)

A new invasive pest of Croton, other ornamental plants and fruit trees in the Cayman Islands

Croton Scale

Phalacrococcus howertoni

(Hodges and Hodgson)

A Pest of Croton, fruit trees and other plants in the Cayman Islands

The Croton scale is a serious, invasive insect pest of fruit trees, ornamentals and non-cultivated plants. The pest was first detected during 2013 and confirmed to be *Phalacrococcus howertoni* (Hodges and Hodgson) in June, 2013. The Croton scale is a small, oval shaped sucking insect, greenish yellow in colour with black markings. *P. howertoni* is a new pest in the region. It was first detected in Florida 2008 and subsequently it was found in Barbados, 2011. In Florida there are 72 known plants from 34 plant families that are attacked by this scale insect *(Hodges and Hodgson. 2010. New So Scale in Florida Entomologist)*

Fig 1. Adult and immatures of this new scale insect on croton
(Photograph credit: Lyle Buss, University of Florida)

Biology of Croton scale

An adult female produce more than 400 live young ones (crawlers) per day. These crawlers are mobile but remain beneath the female for a few hours before moving out to short distances on the plant, settle at a suitable spot and begin to feed. Immature males are smaller than the female scales and have a whitish-glossy appearance and tend to settle on the underside of leaves. A Croton scale matures from crawler to adult in 30 days. Males live for 1 day only while females can live up to 60 days.

Fig. 2 Infested Croton plant

How the pest spreads

The crawlers of the Croton scale are light. Hence, they can be spread by wind. They will also be spread with the movement of infested live plants, on plant cuttings, by 'hitch-hiking' on animals or on clothes and garden tools.

Damage caused by Croton scale

The Croton scale builds up large populations very quickly. They feed by piercing the plant with their needle-like mouthpart and suck large amount of sap from the stems and leaves of the host plant. The feeding action cause leaves to turn yellow, wilt and large numbers drop prematurely.

Croton scales also excrete an abundance of honeydew, a sweet, sticky liquid produced by insects that ingest large quantities of plant sap. The honeydew contaminates fruits, leaves, as well as the upper surfaces of the leaves growing beneath infested plants. The honeydew attracts ants and encourages the growth of black sooty mold. The sooty mold does not invade the plant tissues but its thick layer blocks sunlight from leaves. Without sunlight the plant is unable to make food (photosynthesize). This weakens infested plants and before long these plants may be reduced to bare dry stems and eventually die.

Fig. 3 Infested tree covered with sooty mold

Plants affected by Croton Scale

The Croton scale has a wide host range. However, Croton (*Codiaeum variegatum*), appears to be its primary host and all colour forms are affected by this pest. In the Cayman Islands already ten (10) types of plants are affected by this scale insect:

Fruit trees

Guava (*Psidium guajava*)
Avocado (*Persea americana*)
Breadfruit (*Artocarpus altilis*)
Mango (*Mangifera indica*)
Sour sop (*Annona muricata*)
June plum (*Spondias dulcis*)
Cayman red plum (*Spondias purpurea*)

Ornamentals

Croton (*Codiaeum variegatum*)
Acalypha (*Acalypha wilkesiana*)

Native tree

Red birch (*Bursera simaruba*)

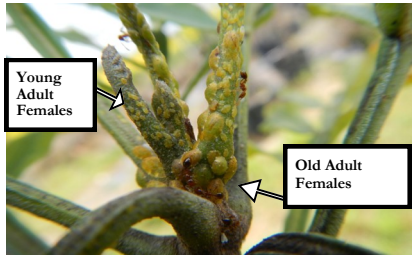

Fig. 4 Plant infested with Croton Scale with ants collecting honeydew.

Management Strategies

Efforts to better understand and control this new pest are actively going on in the region. However, based on what is already known there are a number of potential options for its management and control. In making decisions on which strategy to adopt, it is important to consider the type of plant that is infested, the level of infestation, and the surrounding environment.

Biological Control

There is good news. A ladybug, (*Thalassa montezumae*), has been observed feeding on croton scales. The adult ladybug is known to consume large quantities of croton scales which will help to control the pest especially on host trees in the wild. However, their populations are still relatively small. For the long term, beneficial insects offer the best potential for effective control. Therefore, it is important that every effort be made to use control measures that will minimize potential negative effects on the survival and multiplication of the natural enemies which will ultimately provide the best long-term control.

Fig.5 Natural predator Ladybird beetle (*Thalassa montezumae)* feeding on the Croton scale

CAUTION

The young *T. montezumae* (ladybugs) develop on infested plants; they are white in colour do not mistaken them for pests such as mealybugs

Recommendations for landscapes:

Cultural Practices

- **Monitor** by examining stems and the undersides of leaves for early signs of Croton scale infestation. it is much easier to manage the pest before populations build to high levels and cause major damage.
- Collect, double bag fallen leaves and dispose of them at the land fill.
- If infested trees are trimmed, leave clippings on the property to allow ladybugs to emerge before double bagging and transporting them to the landfill.
- When transporting infested material ensure that it is either bagged or covered with a tarp to prevent further spread of the pest.
- Dispose of infested material at the landfill only.