Major Pests of Pumpkin in Jamaica & their Control

Did you know that almost all tropical pumpkins sold in the United States are imported from Jamaica and Central America? In the US there is a growing Latin and Caribbean population hence a good market for edible pumpkin (*Cucurbita moschata*). Bearing this in mind researchers at Bodles Research Station have over the past seven years worked assiduously to develop new technologies for improved pumpkin production. One component of this work involves pest management. Pumpkin is considered to be naturally pest resistant but if conditions are favourable there are a few key pests that can become of economic importance.

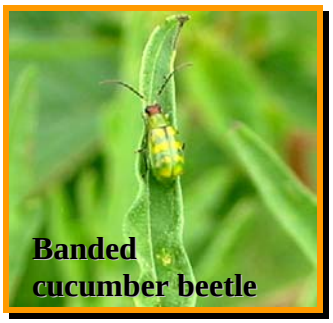
Melon worm *Diaphania hyalinata* is a key pest of pumpkin in Jamaica. This species is distinguished from closely related species by the presence of a white stripe extending the length of both sides of the body at the 5th larval stage. Melon worm larvae prefer foliage but with severe infestations they may feed on pumpkin flowers and fruits. Infestation levels are higher after a period of rainfall.

Melon worm life stages & damage

A. *Melon worm larva on underside of leaf;* **B.** *Adult partially covered by leaf &* **C.** *Leaf damage*

Natural enemies play a key role in suppressing melon worm populations. At the Bodles Agricultural Research Station, the paper wasp (***Polistes* sp.**) was very active in pumpkin plots and was effective in keeping the melon worm population below a given threshold provided conditions were favourable to the wasp.

VECTORS OF VIRUSES



Adults of the **banded cucumber beetle** *(Diabrotica balteata)* are foliage feeders. Eggs are laid on the soil surface in crevices and larvae will feed on pumpkin roots and roots of other crops (e.g. corn and pepper). Banded cucumber beetles belong to a group of beetles that are vectors of squash mosaic virus that causes extensive reduction in pumpkin production.

Aphids can cause direct feeding damage in high numbers. Sooty mold and ant activity may indicate their presence. They are also vectors of important cucurbit viruses. The **melon aphid** *(Aphis gossypii)* and **green peach aphid** *(Myzus persicae)* are vectors of **cucumber mosaic virus** and **watermelon mosaic virus 2**.

Virus symptoms

Mosaic symptoms on foliage

Green ringed lesions on fruit

Downy mildew caused by the fungus *Pseudoperonospora cubensis* is favoured by cool (night temperatures) wet conditions with prolonged leaf wetness. This disease is common during the mid to late season of the crop. Crop rotation is not an effective control measure for this disease since infected plantings on neighbouring farms can still be a source of inoculum, or means of spreading the fungi.

Downy mildew

Chlorotic lesions on upper leaf surface

Tan grey fuzz (fungal spores) on underside of leaf

Powdery mildew on upper leaf surface

Powdery mildew

Powdery mildew caused by the fungus *Erisiphe cichoracearum* prevails under cool (night temperatures) dry conditions. This disease is also prevalent during the mid to late season of the crop.

Phytophthora fruit rot caused by the fungus *Phytophthora cactorum* develops when fruit come in contact with soil containing high moisture levels. Symptoms include soft, water soaked spots on fruit with signs of white yeast-like growth. The disease is favoured by warm wet conditions.

***Phytophthora* Fruit rot symptoms**

The **root knot nematode** *Meloidogyne incognita* can be a limiting factor to pumpkin production. If pumpkin is planted in nematode infested soil, crop roots will become damaged, and plants will develop and yield poorly.

Root knot symptoms

Land preparation

1. Select an area of land not previously cultivated in cucurbits but an unrelated crop e.g corn to minimize attack by soilborne fungi and nematodes. Test soil for presence of soilborne pathogens and nematodes.

2. Deep plough soil to expose nematodes and larval stages of cucumber beetles to desiccation

3. Prepare raised beds, ensure proper soil drainage and avoid planting in low - lying areas.

Cultural practices

1. Use healthy seed to avoid the introduction of seedborne viruses and fungi into plantings.

2. Avoid overhead irrigation or apply early in the morning to allow leaves to dry off, this minimizes fungal disease development.

3. Practice good field sanitation to reduce insect pests and sources of fungal inoculum.

4. Water and fertilize on time to encourage foliage resulting in good soil coverage to minimize weed growth. Timely weed management is critical at the most vulnerable stages of the crop to prevent weed competition and eliminate pest reservoirs.

Monitoring

1. Routinely scout fields by walking in a V or X pattern and checking leaves for presence of insects. When a threshold of 1 larva/leaf for melon worm has been reached chemical control is warranted.

2. Scouting for fungal diseases should be intensified during conditions favouring disease development.

Chemical Control (Please follow the pesticide label)

1. Downy mildew – Treat with a systemic fungicide containing metalaxyl - M e.g. Ridomil MZ® in rotation with a contact e.g chlorothalonil (Bravo ®or Daconil®). Strobilurin compounds eg Amistar® a new systemic fungicide can also be used in place of metalaxyl but must be used in rotation with contact fungicides. This delays resistance development.

2. Powdery mildew – Treat with a systemic fungicide containing thiophanate - methyl e.g. Topsin M® but in rotation with contact fungicides such as chlorothalonil and copper based compounds (Mankocide®, Top Cop® or Trimiltox Forte®).

3. Phytophthora fruit rot – Preventative treatment is recommended. A systemic fungicide containing metalaxyl can be used in rotation with a copper based fungicide or chlorothalonil.

4. Melon worm – Use more environmentally friendly or selective insecticides e.g. those containing *Bacillus thuriengensis* (Bt) (Dipel®, Xentari®, Agree® and New Bt®). Bt-insecticides work best for early larval stage hence early detection is critical. Target applications directly under leaves to get proper coverage.

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