Identifying and Managing Anthracnose in Mirlitons (chayote)

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Different seasons bring different diseases.

Anthracnose is a summer disease caused by many fungi, but the pathogen that affects mirlitons is *Colletotrichum lagenarium*. For the purposes of this article, I will call *Colletotrichum lagenarium* the "anthracnose fungus". It is a chronic problem with mirlitons and it's the main reason plants die the first year. It is easy to distinguish from powdery mildew (PM), the dominant spring disease. The PM fungus spreads on the *surface* of leaves as a slowly, generalizing yellow (chlorotic) patch until the whole leaf uniformly wilts and dies. Anthracnose, in contrast, grows *inside* the leaf cells and spreads cell-to-cell (intercellularly)l, so it tends to spread between the leaf veins and form sharp wedges. It kills the tissue within the wedge before the whole leaf, so you will see both chlorotic and necrotic tissue in the same wedge photo.

1 Mirliton leaf infected with anthracnose. Unlike powdery mildew which yellows uniformly and wilts the leaves, anthracnose starts as yellow wedges between the leaf veins. It then turns the leaf tissue brown and leaves with a distinctive "shot hole"

We tend to get anthracnose epidemics in July and August because of our rain patterns. Intensive rains splash up anthracnose fungi from the ground onto the plant stem. The fungus incubates in the warm nights and produces thousands of spores (conidia) that are contained in a sticky base. Rainstorms dissolve the sticky film which releases the conidia. Raindrops splash the spores to adjacent leaves, and now you have an anthracnose epidemic.

Anthracnose infects the leaves, petioles, and stems. it will eventually split the stem and that prevents the flow of nutrients to the ends of the stem, so suddenly a whole section of the vine will wilt and die. The good news is that for every stem lost, a healthy vine will send up a new shoot. It is a tug-of-war with the disease through the summer, but generally, the disease will abate by September in time for flowering and fruiting.

The key to surviving an anthracnose epidemic is to have a healthy vine in place before the epidemic. That means a well-drained and aerated vine. When the soil is water-saturated and no oxygen is available in the root zone, plants go through dramatic changes to survive. They are literally in "anoxic" soil like the dead zones in the Gulf of Mexico. They shift from aerobic metabolism to anaerobic metabolism: *they have only 5% of the energy efficiency* they have in healthy aerated soil; they produce toxic organic and inorganic compounds, and they deprive the leaves of potassium crucial to maintaining leaf functions. After 24-48 hours, the roots have been damaged making it more difficult for them to uptake water and nutrients. Leaf functions are weakened and the whole plant is vulnerable to disease.

The solutions are simple.

Ground Planting:

Make sure the soil is well-drained and aerated. Plant on your highest area available, use planting hills, and stay away from roofs. Plant near a tree if you have one; trees are natural sponges and tend to stabilize soil moisture. If you already have the vine planted, you can dig shallow drainage trenches to remove excess rainfall away from the vine or add a corrugated drain pipe or a French drain.

Container Planting:

Remember that a saturated bed can't drain into a saturated yard. Build large 10' X 3' x 2' bed using fast-draining commercial potting soi and install a subsurface corrugated drainpipe. If you already have a raised bed, add a lateral route for excess water to exit above ground level (drill 1/4 " holes along the side panels so excess water drains laterally).

Prevention is the best disease management that we know, currently. Currently, I have not found that synthetic or biological fungicides work effectively to control anthracnose in mirlitons.

For now, the best protection against anthracnose is (1) to use only locally grown heirloom mirlitons for seed since they are likely to have some resistance to anthracnose; (2) plant in well-drained, aerated sites; (3) provide plenty of trellis space so leaves on top can spread out and get maximum exposure to sun (a natural fungicide) and air circulation; (4) minimize leaf/soil contact with an overhead horizontal trellis at least 4 feet above the soil and (5) always irrigate gently with a hose set on low on the surface or drip irrigation to prevent splash-up of soil-borne fungi. Once leaves and stems are brown and dead, remove them and dispose away from the mirliton.

Photos of anthracnose damage on mirlitons: leaves and stems, different stages. Click on each photo for descriptions:

https://www.mirliton.org/photo/anthracnose-damage-to-mirliton-plant-parts/